

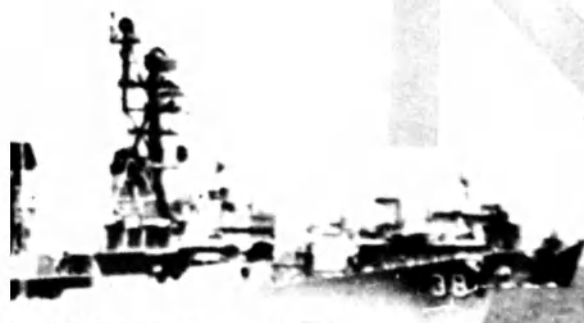
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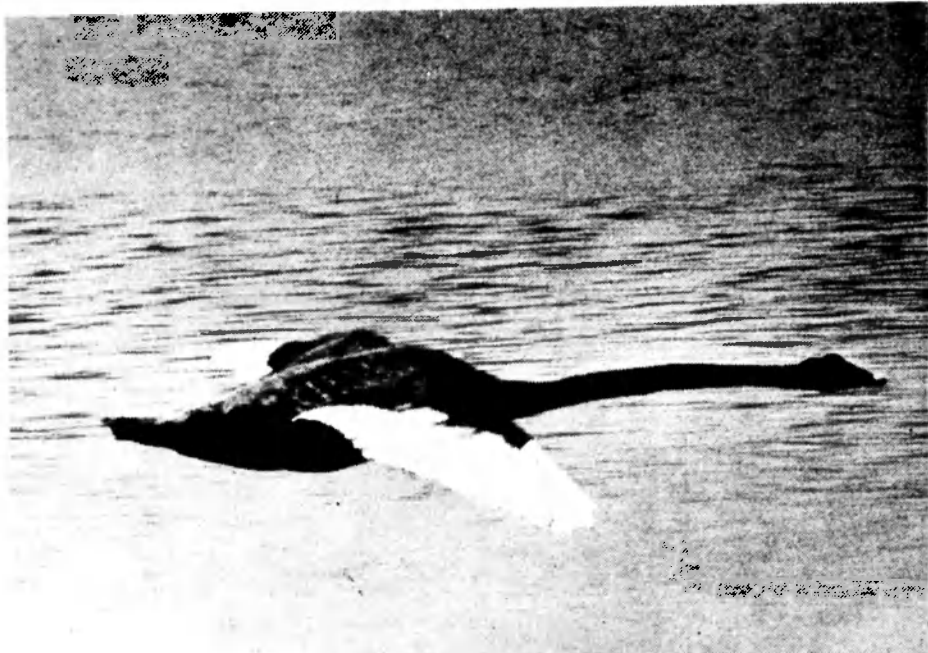
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AIRLINES OF AUSTRALIA

# THE NAVY

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

Vol 36

AUGUST-SEPTEMBER-OCTOBER, 1974

No 3

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THE NAVY

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**A Message from the . . .**

**CHIEF OF NAVAL STAFF**

**Vice-Admiral H. D. Stevenson, CBE**

Navy Week is a very important event. It provides the opportunity for the people of Australia to meet the Navy, and during this week in ships and establishments throughout Australia the public will be shown how we work.

For the rest of the year the public's contact with the Navy is a little remote and as we go about our business we cannot always give our first thoughts to how we are seen by others or whether the people of Australia are alive to the part seapower plays in the country's national strategy.

It is reassuring therefore to know that there is an organisation such as the Navy League dedicated to the best interests of Australia and active in making the people of Australia aware of the importance of seapower in upholding and protecting these interests.

Events since the Second World War have shown that it has seldom been possible to perceive the nature and timing of situations that have led to the commitment of our forces. In the absence of specific threats and in recognition of the time that it takes to develop maritime forces we need to ensure that we maintain a general capability. There is daily evidence of the forces of instability in the world and the absence of a direct threat can be no justification for diluting our preparedness.

I want you to know how much people in the Royal Australian Navy appreciate your enthusiastic and much needed support on our behalf.

Thank you and I wish you every success in your very worthwhile work.

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## **Annual Message from the Federal President of the Navy League of Australia**



As I write this 1974 "message" to members of the Navy League the attention of most Australians is directed towards the economic problems which trouble our country, and which affect us all personally in one way or another.

It is never easy in peacetime to maintain public interest in national defence, and even more difficult at a time like this: And yet seldom before has the subject of defence required closer attention by the community than it does now.

A major re-structuring of our defence organisation; the future shape of the Navy, Army and Air Force, and the equipment they are to have; policies adopted and decisions made (or not made) in these two areas alone will inevitably affect our defence capability a decade and more hence: But how rare it is for either subject to be debated in the Parliament or reported in the news media.

No matter how difficult it may be, we in the Navy League must continue in our traditional role as a "watchkeeper" of the nation's maritime security. At a time of preoccupation with economic affairs and social objectives, I believe our proper course is to stress the importance of keeping a sense of proportion and of getting our priorities right.

I am sure we will overcome our present economic difficulties, but it is unlikely we will survive as a free country if we ignore defence issues now, and pretend that we can re-create an effective defence capability at will at some future date.

## **OUR COVER**

**HMAS PERTH ON EXERCISE**

(RAN OFFICIAL PHOTOGRAPH)

(Situated at Quakers Hill, NSW, HMAS NIRIMBA will be open for public inspection on Sunday, 13 October, 1974, 11.30 am to 5.30 pm)

REFER PROGRAMME OF EVENTS AT CONCLUSION OF THIS ARTICLE

# H.M.A.S. NIRIMBA

Situated 25 miles west of Sydney, HMAS NIRIMBA is the Royal Australian Navy Apprentice Training Establishment (RANATE) and its prime role is the training of Naval Apprentices in the various trades required in a modern and technical Navy. Apprentices after a rigorous selection procedure enter in January and July of each year.



*AMTP Kenneth Testa, 19, of Footscray, Vic, pictured maintaining equipment at the Royal Australian Navy apprentice training establishment, HMAS NIRIMBA, at Quakers Hill, near Sydney. Kenneth enlisted in the Navy two years ago and is a former student at Tottenham Technical School.*

Until June, 1972, a Naval Apprentice entered the Navy for a period of twelve years. The first three and one-half years were spent at NIRIMBA followed by 18 months with the Fleet gaining experience at sea. This completed their apprenticeship. The last apprentices entered under this scheme pass out from NIRIMBA in December of this year.

In June, 1972, the new four year apprenticeship system was introduced. Apprentices now spend two years at NIRIMBA learning the basic skills applicable to their trade and then go to sea for two years to complete the practical section of their trade. This completes their apprenticeship which is recognised by the NSW Apprenticeship Commission.

Categories available to apprentices are:

## Naval Category

Marine Engineering Technical Propulsion (MTP)  
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Electrical Fitter (Communications)  
Fitter  
Electrical Fitter (Electronics)  
Electrical Fitter (Communications)

In addition to the training of RAN apprentices, NIRIMBA also undertakes the training of RAN sailors as mechanics, direct-entry naval shipwrights, Papua New Guinea naval apprentices, Royal Malaysian Navy apprentices and mechanics and conducts advanced welding, precision soldering and other short courses.

Mechanicians achieve craft status during adult Naval service by selection and a two-year course at NIRIMBA, at the successful completion of which they are regarded as equal of the artificers produced by apprentice training.

Vacation training of university undergraduates, both uniformed and civilian is becoming an increasing commitment of NIRIMBA.

Outside normal working hours, a large number of activities are available to apprentices. Theatre parties enable apprentices to visit most of the live theatres in Sydney for a small charge and film theatres for about \$1. Very recent films are also shown at NIRIMBA in the Assembly Hall three nights a week. A library, games room and TV rooms are provided, as well as a canteen in



*AMTP Stan Kuncio, 17, of Millthorpe, takes precision measurements on a valve body in the metal workshop at the Royal Australian Navy apprentice training establishment, HMAS NIRIMBA, at Quakers Hill near Sydney. Stan, who entered the Navy as a junior recruit two years ago, is a former student at Blayney High School.*

*AETW Peter Oliver, 18, of Gin Gin, Qld, at work in the machinery shop at the Royal Australian Navy apprentice training establishment HMAS NIRIMBA, at Quakers Hill, near Sydney. Peter, who enlisted in the Navy eighteen months ago, is a former student at the Southport School.*

which parents and friends may be entertained. Also, in each divisional block, specially decorated guest rooms have been made available.

NIRIMBA has facilities for most popular sports: rugby, Australian Rules football, soccer, hockey, athletics, tennis, basketball, cricket and others. There are clubs for those interested in car rallying, water skiing (there are two boats), rifle and trap shooting and boxing.

NIRIMBA has teams in the normal Wednesday afternoon intership competitions and also teams compete in a number of the local weekend competitions with considerable success.

A master plan to replace the existing wartime structures by brick buildings has been drawn up and is being implemented. These include new accommodation buildings and dining rooms for both ship's company and apprentices, and a sporting complex with swimming pool.

HMAS NIRIMBA offers young men of today a chance to learn a trade under the best possible conditions





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## HMAS NIRIMBA

NAVY WEEK — OPEN DAY

SUNDAY, 13 OCTOBER, 1974

### PROGRAMME

TIME	EVENT	DURATION
11.30 am	NIRIMBA "Open".	
12.30-4.30 pm	Films	Continuous
12.30-4.30 pm	Slot Car Racing	Continuous
12.30-4.30 pm	Steam Truck, Steam and Tractor Trains Children's Rides	Continuous
12.30-4.30 pm	Merry-Go-Round and Pony Rides	Continuous
1.00 pm	Band Recital	30 mins
2.00 pm	Wessex Helicopters Winching Drills and Flying Display	20 mins
2.40 pm	Gymnastics Display	20 mins
3.10 pm	Band Recital	30 mins
4.00 pm	Wessex Helicopters Winching Drills and Flying Display	30 mins
5.00 pm	Band Marching Display to include "Beat The Retreat", culminating in Ceremony of Sunset	30 mins
5.30 pm	Visitors leave	

Come to HMAS NIRIMBA and see Navy Apprentices at work on lathes, grinding and milling machines in the workshops. Electronic equipment, TV, radar trainers, digital computers and transistor equipment will also be worked on by the apprentices. Static displays will include Venom Jet, Firefly and Tracker Aircraft, aircraft engines, ejector seat and Craft Test Jobs.

AMTP Kevin Benson, 19, of Port Augusta, takes the measurements of a taper with a micrometer in the workshops at the Royal Australian Navy apprentice training establishment, HMAS NIRIMBA, at Quakers Hill, near Sydney. Kevin, who enlisted in the Navy two years ago, is a former student at Port Augusta High School and a member of the Port Augusta Men's Hockey Association.

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# Lessons from Naval Warfare, 1971

By A. W. GRAZEBROOK

Federal Vice-President,  
the Navy League of  
Australia

*F class large attack type fleet submarine. The Indian Navy has four of these Russian-built submarines fitted with ten, 21-inch torpedo tubes.*

Since World War II, submarines have fired torpedoes in anger in only one war. In 1971, both India and Pakistan used submarines on active service against warships and merchant shipping.

With the nuclear balance making submarine warfare much more likely, and with a major world resurgence in the construction rates of diesel electrically powered submarines, the Indo Pakistan conflict is well worth studying to learn lessons both from the way in which the two nations used and countered the submarine weapon, and from the way in which they have translated their practical experience into new construction for, or modernisation of, their navies.

## Indian Naval Forces Available in 1971

At the start of the war, India had four new F type diesel electric sub-

marines of Russian construction. These are large "long legged" ocean going boats of 2000 tons surface displacement and a maximum submerged speed of 15 knots. These submarines are normally based at Vishakapatnam, on the Bay of Bengal, but time in operational areas in the Arabian Sea can be increased by stationing the large submarine depot ship INS AMBA in the Western Naval Command.

The core of Indian naval surface forces is their aircraft carrier INS VIKRANT, given extended range by the fleet replenishment ship INS DEEPAK, and escorted by a number of modern escorts. After providing escorts for the carrier group, India had a number of escorts available

for escorting their merchant vessels, and "search and destroy" operations. In addition, there were eight fast patrol craft armed with surface to surface guided weapons, landing craft, mine clearance craft, and two elderly cruisers. A second fleet replenishment tanker was requisitioned from trade for the duration of hostilities.

The effective way in which the Indian High Command and Naval Staff used their naval forces demonstrated an impressive ability to apply their sound knowledge of maritime strategy, supported by a well trained fleet (of widely varying age) and a sound command structure.

## Pakistan's Position

The Pakistan Navy started the war at so serious a material and strategic disadvantage that it had no hope of more than hindering the Indian

Navy. Apart from a squadron of minesweepers, all Pakistan's sizable surface units were over twenty years old and hopelessly outclassed by the Indians. A number of patrol craft, based upon what was then known as East Bengal, had little chance of survival.

Pakistan had four submarines — three new Daphne type boats of French construction (700 tons, 15½ knots underwater speed), and the much larger elderly ex-American "Tench" Class submarine PNS GHAZI (1570 tons, 10 knots underwater speed). The published range of PNS GHAZI was 1400 nautical miles at 10 knots, but that of the Daphnes was much lower. No figures were published for the Pakistani Daphnes, but the French gave the figure for their own boats of this type as 2700 nautical miles at 12 knots. Apparently, the Indians based a number of assumptions on this figure, particularly that the only Pakistani submarine that could reach the Bay of Bengal would be PNS GHAZI. Events were to prove that one Daphne also operated in the Bay of Bengal — PNS MANGRO.

## India's Dispositions and Actions

The Indian Navy was divided into two area commands, each under a Vice-Admiral Commanding in Chief — Western Naval Command (Bombay) and Eastern Naval Command (Vishakapatnam), with a Rear-Admiral afloat in each command. In accordance with India's strategic objective of resolving the East Bengali problem by a land invasion, the carrier task group was assigned to support the land forces in the Eastern Command area. Two PETYA Class and two Type 41 frigates, the three R Class destroyers, one submarine, the two POLNOCHNY Class LSTs and a troop transport were also assigned to Eastern Command. Of these vessels, two Type 41 frigates and one PETYA were assigned as escorts to the carrier group.

To Western Naval Command were assigned the elderly cruiser INS MYSORE, six frigates, three submarines, and the eight OSA class fast patrol boats armed with surface to surface guided weapons. Western

Naval Command was charged with the neutralisation of Pakistani surface forces, the protection of Indian trade (including safeguarding the vital oil imports), and the destruction of Pakistani trade including the prevention of the importing of arms by sea.

India's Eastern Command operated the carrier group constantly against Chittagong and minor ports, military targets ashore, and in the neutralisation of potential means of maritime escape for the retreating Pakistani Army. Other Eastern Command units blockaded East Bengal, capturing six merchantmen and a number of smaller craft. A small amphibious force tried unsuccessfully to land over the beach near Cox's Bazaar. The failure is attributed to lack of planning and amphibious "know how".

To achieve his objectives, Vice-Admiral Kohli of Western Command struck quickly and hard. He despatched three OSA Class guided missile armed fast patrol boats, supported by two of the fast PETYA Class frigates, to attack Karachi

*Pakistan has three of the Daphne Class submarines — MANGRO, HANGOR and SHUSHUK.*

Harbour. Two Pakistani Battle Class destroyers were encountered at sea. One was sunk and the other damaged severely by guided missiles. Five merchantmen were also sunk. After this setback, the Pakistani surface forces did not again leave harbour.

The balance of Admiral Kohli's fleet, including his three submarines, was employed in anti-submarine and blockade activity. There was a series of anti-submarine actions, culminating in the destruction by three torpedoes of the Indian Type 14 frigate INS KHUKRI, that ship having apparently failed to take normal anti-submarine tactical precautions. All Pakistani trade ceased, and many neutral cargo vessels withdrew from the area or ceased trading in the area.

On the outbreak of war, India instituted full Naval control of shipping. Supplies of oil flowed uninterrupted to India. So far as is known, the Indians prevented the loss of any of their merchantmen.

#### Pakistani Activities

The Pakistanis despatched their elderly submarine PNS GHAZI and the Daphne Class PNS MANGRO to

the Bay of Bengal to seek and destroy the aircraft carrier VIKRANT. PNS GHAZI was destroyed during a minelaying expedition off Vishakapatnam. Some reports state that she was destroyed by depth charges from the World War II destroyer INS RAJPUT, whilst other reports say that GHAZI was destroyed by an internal explosion, possibly a mine.

PNS MANGRO located the Indian carrier group, but was driven off by the Indian escorts. There are conflicting reports as to why the Pakistani submarine did not press home her attack.

#### Lessons of the Naval War

During the war, the Indian Navy adopted the sound strategy of neutralising the Pakistanis' surface forces early and thus eliminating any significant surface threat. The Indian surface to surface missiles proved as destructive as had been expected, but they were only tried against elderly warships and merchantmen.

The Pakistani surface craft had no modern effectively controlled rapid fire weapons, nor were Pakistani air-

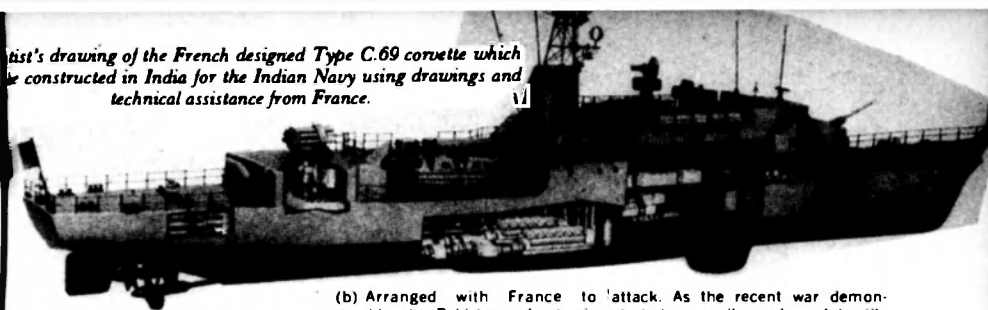
craft on hand, to counter the Indian patrol craft. Furthermore, the Indian patrol boats were supported by Indian surface craft which alone were superior to the Pakistani destroyers at sea off Karachi.

The effectiveness of seaborne surface-to-surface missiles, against virtually defenceless targets, has again been proven. The world has yet to see this type of missile used in fully opposed naval circumstances.

The world saw Pakistan use conventionally powered submarines as an inexpensive offensive weapons system that can force the defender to devote very substantial resources to the defensive (protection of his trade). The four Pakistani submarines forced the Indians to allot the greater part of their Navy to the protection of trade against submarine attack. In this war, nuclear powered submarines did not participate. In these circumstances, diesel electric submarines were very effective.

The importance of accurate technical intelligence of an enemy's capabilities was demonstrated. The Indians, understandably, underestimated the range of the Daphne class submarines, with the result

Artist's drawing of the French designed Type C.69 corvette which was constructed in India for the Indian Navy using drawings and technical assistance from France.



that one of them appeared unexpectedly in the Bay of Bengal.

The Indians demonstrated the feasibility of converting mercantile tankers to handle replenishment of warships at sea. The fallacy of assuming that, because a Navy has no RAS capability in peacetime, it cannot do so in very quick time, was demonstrated by the Indians.

#### Pakistan Applies the Lessons of War

After suffering heavy surface craft losses in the War, and after the obsolescence of her remaining craft had been demonstrated, the Pakistani Navy was faced with the need to replace these losses, and to acquire a weapons system or systems that would give Pakistan some sort of naval deterrent credibility against India.

Whilst something must be done to acquire new surface vessels, to increase her surface strength to the point where it would be anything approaching a match for the well established Indians would place an unacceptable burden upon Pakistan's limited resources. In any future war with India, Pakistan's seaborne trade will be cut off.

The effectiveness of fast patrol boats, armed with surface to surface guided weapons, against attack by surface vessels, offered a relatively inexpensive measure for defence of the approaches to Karachi.

The effectiveness of the submarine weapons system was as clear to Pakistan as it should be to any other country.

In applying these lessons, Pakistan has:

(a) Made arrangements to acquire four middle-aged Type 12 frigates from Britain. The weapons outfits of these vessels will have to be modernised before they can be effective against India's "F" type submarines.

(b) Arranged with France to assemble, in Pakistan, about six submarines of about 1000 tons displacement.

(c) Ordered six midgeet submarines from Italian yards.

(d) Commenced negotiations with the French to acquire some long range maritime patrol aircraft.

The choice of type of submarine is of particular interest. Instead of increasing their force of the small Daphne type submarines, the Pakistanis are seeking the much larger AGOSTA type, with a range of nine thousand nautical miles at nine knots and a maximum submerged speed of 20 knots. These craft will be able to range all around India's coasts (and much further afield if necessary).

#### India Develops Her Navy

India is one of the few powers with sizeable maritime strength to have used her naval forces in full scale conventional war. The effectiveness of her carrier air group in support of land forces, and in the strike role against enemy port installations etc., has apparently been noted. It is reported that India is considering how to replace the aging VIKRANT, and has commenced exploratory talks to acquire VTOL/STOL aircraft to operate from either a through deck cruiser or a sea control ship.

The effectiveness of modern diesel electric submarines has been noted. India plans to acquire four more F Class submarines, to give her a total strength of eight boats. There are reports that these are to be, or are being, assembled at Vishakapatnam.

The other side of the submarine lesson of the war — the need to defend herself against submarine attack — presents India with very real problems. She depends upon imported oil and other raw materials, and must ensure the safe passage of these against submarine

attack. As the recent war demonstrated, a small number of hostile submarines compels the disposition of substantial escort forces in defence. India plans to acquire five more PETYA class frigates. Five LEANDER Class frigates are under construction, or planned, at Bombay. Drawings and technical assistance are being purchased, from the French, for the construction in Bombay of an unspecified number of C69 series small frigates. It is not clear whether the construction of these vessels involves the cancellation of the last three LEANDERS.

The LEANDERS are highly regarded throughout the world as effective and reliable escorts, both in the fleet and mercantile escort roles. It could be argued that three LEANDERS, with the ten PETYAS India will have, form an adequate pool of escorts for surface warships, and that resources should be devoted to a larger number of smaller escorts, for the vital trade.

The choice of the C69 type is of interest. These vessels are armed with Exocet surface-to-surface guided missiles, anti-submarine torpedo tubes, one 100mm automatic gun, and two 20mm guns. The diesel power gives a range that is satisfactory to India (4500 miles at 15 knots), but a low top speed (23½ knots). This speed may be adequate to deal with the small Daphnes, but is less promising against the 20 knots of the AGOSTA type, planned by Pakistan. Furthermore, the speed of the C69 type is less than that of many modern merchantmen.

The Indo-Pakistan developments have lessons for Australia, particularly in so far as trade is concerned. Clearly, the Indian Government recognises the vulnerability of vital seaborne trade to submarine attack. It is to be hoped that the Australian Government will be pragmatic enough to accord our own position the same recognition.

A LEANDER class general purpose frigate. Six vessels of this British type are being built by Mazagon Docks Ltd, Bombay, for the Indian Navy.





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All At Sea With —

## THE ROYAL THAI NAVY

In this article Lieutenant J. M. Parkinson, RAN, of the submarine HMAS ONSLOW, records his impressions of three days at sea in the new flagship of the Royal Thai Navy, RTS MAKUTRAJAKUMARN. The visit took place during the combined Thai, British and Australian exercise "Thalay Thai" (Freedom of the Sea) in the Gulf of Thailand last July. Two other Australian officers and one sailor served in Thai ships, and three Thai officers came to Australian ships.

A fresh water shower after 31 days at sea in the submarine ONSLOW was too good a chance to miss. I volunteered.

At dawn of 3 July we surfaced. The Gulf of Thailand had been whipped up by force 5 winds so that the sea was choppy with occasional waves breaking over the casing.

On our port side was the Royal Thai Navy's flagship MAKUTRAJAKUMARN (named after the Crown Prince who is at present studying at the Royal Military College, Duntroon). Her seaboat was soon alongside. Two Thai officers leapt onto our tanks and hauled themselves up the lifeline to the casing. A quick PR photograph and I was on my way down to the whaler. Fifteen minutes later, thoroughly soaked, I was on board the MAKUT.

The exchange of Thai officers and RAN officers for the duration of "Thalay Thai" was now complete. The exercise, involving three Royal Navy and three Royal Thai Navy frigates, a Royal Fleet Auxiliary tanker, HMAS STUART and HMAS ONSLOW, was to include weapons firing and simple anti-submarine exercises.

Having met the commander of the Thai Fleet, Rear Admiral Kamnuan Punsri, and the captain of MAKUT, Commander Kamol Suksingha, on the bridge, I was taken below to the wardroom for a fine "western" breakfast. From the minute I stepped aboard until the MAKUT's seaboat took me ashore in Bangkok three days later, I had nothing but

praise for this Yarrow class frigate, commissioned in 1973.

Her main role is as a gunnery ship with two Vickers single barrelled 4.5 inch automatic guns with M22 fire control and a quadruple Seacat

close range anti-aircraft missile launcher with M44 fire control. That same afternoon we fired against a pilotless target aircraft. Two out of three for both guns were right on target, but the Thais were disappointed because this was below their average of 80%. Their gunnery system is obviously well nigh perfect. Anti-submarine warfare was perhaps the Thai's only weak spot.

*The captain of the submarine HMAS ONSLOW, on the casing of his boat with two Thai officers who joined ONSLOW for Exercise Thalay Thai.*



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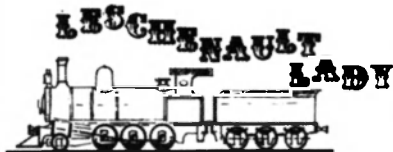
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This they recognise. They have no submarine themselves so the whole exercise was planned to get maximum value out of HMAS ONSLOW. Indeed their next exercise is planned around a US Navy Submarine. Consequently a submariner on the MAKUT was held in some esteem.

MAKUT's machinery spaces were spotless. She has one 12 cylinder Crossley diesel engine and one Rolls Royce Olympus gas turbine driving through a gearbox to two shafts. Both engines are controlled either from a remote control room or from the bridge.

The internal organisation is based on the Royal Navy and works well. The operations room was particularly impressive for the quiet and seemingly efficient atmosphere.

The Thais, a most hospitable and friendly race, invited me to lunch with the Admiral, dinner with the Captain and tea on the bridge. Afternoon tea consisted of ice-cold coffee, a Thai favourite, and toasted sugar sandwiches! All meals were

from the Thai menu — rice and so many delicious styles of cooking pork.

One question I have been asked several times is, "Does the RAN get value out of exercising with a navy which is so much different from our own?" It is true that the RTN and RAN are in many ways chalk and cheese. We concentrate heavily on anti-submarine warfare, while this is a field in which the Thais lack experience, and our sophisticated equipment.

But this is surely why these exercises are worthwhile. I, and the whole of the RAN, now know a lot more about the RTN. We know better what they are capable of and how they operate. The Thais in turn have learned a great deal about our operating procedures, and particularly they have had the chance to exercise their ASW weapons against a submarine. This is particularly important to the Thai sailors who operate their sonar sets, for some of them have never heard what a real submarine sounds like.

I think the exercise "wash up" showed that we still have a great deal to learn about each other, particularly in the fields of operating procedures and communications. It is amusing and a little disconcerting that the Thais say they can understand an American voice on the radio quite easily, but cannot fathom the "deep south" accent of the Australians.

As one of the technologically advanced naval powers in South-east Asia, we should be able to offer sound advice to our Thai colleagues, and because we have considerable expertise in ASW and a growing fleet of submarines we could be of considerable assistance in this field. However, after seeing MAKUT at work I doubt whether we could teach the Thais much about gunnery!

Rear Admiral Kamnuan Punsri sincerely hopes that the MAKUT will visit Australia in the not too distant future. I hope so too, she'll attract much attention. That shower was well worth volunteering for.

*Australian and Thai ships exchanged officers and sailors during Exercise Thalay Thai in the Gulf of Thailand. Picture shows the captain of the Australian submarine HMAS ONSLOW, Lieutenant Commander R. R. H. Fayle, welcoming two Thai officers. One officer from ONSLOW, Lieutenant Michael Parkinson, spent three days in the Royal Thai Navy's flagship MAKUTRAJAKUMARN, and another, Sub-Lieutenant Bob Carter, exchanged with PRASAE.*



## ECUMENICAL CHURCH SERVICE

Interested Members  
of the Public are  
invited to Attend  
and Parking Facilities  
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within the Dockyard

By THE CHAPLAIN



*Garden Island Dockyard Church showing the altar and stained glass memorial windows.*

**The Ecumenical Service for Navy Day, 1974, will be held at 10.30 am, Sunday, 13 October, in the Garden Island Dockyard Church.**

We will meet to worship together as an outward demonstration of our essential unity as Christmas. Together we shall thank God for those who have given so much in securing the protection and safety of our Country, and pray that we may be responsive to His will and guidance in the years to come.

We are grateful that leaders in the Churches in Sydney have agreed to share in this Service and bring the distinction of their presence to this

*The pulpit, shaped in the form of a ship's bow, is one of the prominent furnishings in the Garden Island Dockyard Church.*



occasion.

The President of the New South Wales Methodist Conference will preach the occasional sermon.

Participating clergy will include His Eminence Cardinal James Freeman and the Moderator of the New South Wales General Assembly of the Presbyterian Church of Australia, also a representative of the Anglican Church.

The Flag Officer Commanding East Australia Area, Rear Admiral

Dovers, CBE, will be present and music will be provided by the RAN East Australia Area Band.

So far as is known, the first Service to be held in this Church was in 1902, and was a thanksgiving Service for peace at the end of the South African War.

The first stained glass windows were installed in 1904. Since then the Church has been beautified by many Memorials, all of which tell their own poignant story.

For many years the Church has been used for all Church Services held in Garden Island. Protestants and Roman Catholics have come to feel that it is their Church.

An ecumenical spirit has always existed in the working relationships between serving Chaplains. But this has grown in the new atmosphere of unity and trust which we believe is God's will for His Church. It is appropriate therefore that we should together thank God for His grace and pray for His guidance in the future.

There are a number of groups which hold their Annual Church Services here — amongst them are Sydney Legacy, the Naval Association of Australia, The Naval Reserve Cadets, Sea Scouts and Sea Rangers.

We hope that some from these organisations as well as interested members of the public will join with us in this Service.



# Navy Week In Australia

**Navy Week is one week in each year when Australians from coast to coast are urged to pay grateful tribute to those who have served and those now serving Australia at sea.**

During this week it is fit and proper that a nation of free men and women give well-deserved honour and recognition to the patriotic and victorious achievements of its men of the sea. It is the week for Australians to re-dedicate themselves to those principles of freedom and self-government which they cherish. It is a week in which grateful citizens should salute their Royal Australian Navy and make sure that it is adequate to fulfil its contribution to our national security.

In the Royal Australian Navy the month of October has always held special significance. The 21st commemorates the 169th anniversary of the victory of the Battle of Trafalgar. Fought in the Atlantic, off the southern coast of Spain, it was the last great Naval battle to be fought under sail alone.

Sixty-one years ago, on 4 October, 1913, the Australian Fleet steamed into Sydney Harbour. Navy week, 1974, was planned to coincide with the anniversary of the Fleet's entry.

The arrival of the ships in 1913 was an event Australians had looked forward to for half a century. They were their own ships, paid for by their own money and manned in large proportion by their own men; the

nucleus of what they hoped would be their own Fleet.

The Squadron comprised the Battle Cruiser AUSTRALIA; Light Cruisers ENCOUNTER, SYDNEY, MELBOURNE and the Torpedo Boat Destroyers WARREGO, PARRAMATTA and YARRA.

It is appropriate at this time to recall the words expressed by the then Prime Minister of Australia, The Honourable Sir Joseph Cook:

"Since Captain Cook's arrival, no more memorable event has happened than the advent of the Australian Fleet. As the former marked the birth of Australia, so the latter announces its coming of age, its recognition of the growing responsibilities of nationhood, and its resolve to accept and discharge them as a duty both to itself and to the Empire. The Australian Fleet is not merely the embodiment of force. It is the expression of Australia's resolve to pursue, in freedom, its national ideals, and to hand down unimpaired and unsullied the heritage it has received, and which it holds and cherishes as an inviolable trust. It is in this spirit that Australia welcomes its Fleet, not as an instrument of war, but as the harbinger of peace."

# PROGRAMME OF EVENTS arranged for NAVY WEEK, 1974

## SOUTH AUSTRALIA

**SUNDAY, 29 SEPTEMBER**  
**MONDAY, 30 SEPTEMBER**  
**WEDNESDAY, 2 OCTOBER**  
**THURSDAY, 3 OCTOBER**  
**FRIDAY, 4 OCTOBER**

Cathedral Service at St Francis Xavier's and St Peter's.  
Navy Week Golf Tournament.  
Navy League Reception.  
Naval Officers Club Dinner.  
Commemoration Service and Wreath Laying at War Memorial.  
Reception to be given by the Naval Officer in Charge.  
South Australia.

## NEW SOUTH WALES

**SATURDAY, 12 OCTOBER 1.00 pm-5.00 pm**

A Guided Missile Destroyer will be open for public inspection at Garden Island but the Dockyard area will be closed.  
An updated DARING class destroyer will be open for public inspection at the Overseas Terminal, Circular Quay.  
HMAS WATSON (Watsons Bay) and HMAS PLATYPUS (Neutral Bay) will be open to the public.  
Ecumenical Church Service at Garden Island Dockyard Church (refer separate article).  
HMAS NIRIMBA, Quakers Hill (near Blacktown) will be open to the general public (refer separate article).

**SUNDAY, 13 OCTOBER 10.30 am**  
**11.30 am-5.30 pm**

## VICTORIA

**SUNDAY, 29 SEPTEMBER 10.00 am-5.00 pm**  
**11.00 am**

**MONDAY, 30 SEPTEMBER**

HMAS CERBERUS, Western Port — Open Day.  
Naval Association of Victoria Church Service at Church, South Yarra (The Australian White Ensign will be paraded by RAN Cadets from TS MELBOURNE and the Cadets from that establishment will form the Guard of Honour).  
Navy Week Golf Match at Waverley Golf Club.  
RAN Cooking Demonstration at State Electricity Commission building, Flinders Street, Melbourne.

**TUESDAY, 1 OCTOBER 12 Noon-2.00 pm**

Royal Australian Navy Band Recital and Navy PT Display at National Mutual Plaza, Collins Street, Melbourne.  
RAN Cooking Demonstration at State Electricity Commission building, Flinders Street, Melbourne.

**WEDNESDAY, 2 OCTOBER 12 Noon-2.00 pm**

Royal Australian Navy Band Recital and Navy PT Display at National Mutual Plaza, Collins Street, Melbourne.  
RAN Band Ensemble will play at Allans and Suttons.  
RAN Cooking Demonstration at State Electricity Commission building, Flinders Street, Melbourne.  
Navy Week Bowls Tournament at Fitzroy Bowling Club.  
RAN Band will "Beat the Retreat" at HMAS LONSDALE.

**THURSDAY, 3 OCTOBER 12 Noon-2.00 pm**

Royal Australian Navy Band Recital and Navy PT Display at National Mutual Plaza, Flinders Street, Melbourne.  
RAN Band Ensemble will play at Allans and Suttons.  
RAN Cooking Demonstration at State Electricity Commission building, Flinders Street, Melbourne.  
Navy Week Ball at HMAS LONSDALE.

**FRIDAY, 4 OCTOBER**

**SATURDAY, 5 OCTOBER 2.00 pm-4.00 pm**

Navy Week Race Day at Flemington Racecourse — RAN Band will play.  
Naval Reserve Cadet Units "Open Day" —  
Training Ship BENDIGO at Bendigo  
Training Ship BARWON at Geelong  
Training Ship MILDURA at Mildura  
Training Ship HENTY at Portland  
Training Ship LATROBE at Yallourn  
Training Ship VOYAGER at Williamstown

**SUNDAY, 6 OCTOBER 10.00 am**  
**10.30 am**

Seafarers' Service at St Patrick's Cathedral.  
Seafarers' Service at St Paul's Cathedral — service will be attended by His Excellency the Governor of Victoria and Lady Spinneke. A Colour Party from HMAS CERBERUS will parade the Australian White Ensign. House and Shipping Flags will be borne by Naval Reserve Cadets from Training Ships LATROBE, MELBOURNE and VOYAGER.  
Naval Memorial Service at Shrine of Remembrance following a short march to the Shrine by Ships' Associations. RAN and RANR Bands will participate.  
Re-assembly at HMAS LONSDALE of persons attending Shrine Service.

## QUEENSLAND

**WEDNESDAY, 2 OCTOBER 7.00 pm**  
**FRIDAY, 27 SEPTEMBER**

Navy Day Dinner at United Service Club.  
Cocktail/Dinner Dance at North Star Hotel, Brisbane Street, Ipswich (arranged by the Ipswich and West Moreton Sub-sections of the Naval Association).  
Navy Bowls Day at Wavell Heights Bowling Club (RANR Band will participate).  
Navy Golf Day at Nudgee Golf Club.  
Navy League Dinner at United Services Club.  
Ladies' Luncheon (venue to be set) — organised by Navy Wives.  
Maritime Supper Dance (venue to be set)  
Naval Remembrance Service (Non-denominational) — Anzac Square.  
Annual Seafarers' Service (Non-denominational) at St John's Cathedral.

**SUNDAY, 29 SEPTEMBER**

**WEDNESDAY, 2 OCTOBER**

**THURSDAY, 3 OCTOBER**

**FRIDAY, 4 OCTOBER**

**SUNDAY, 6 OCTOBER**

**11.30 am**

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# SOME HIGHLY VERSATILE WEAPONS OF WAR

By DEREK WOOD

Over the past two decades Britain's armed services have undergone a complete metamorphosis.

From having global commitments and relying on largely conscript manpower, the Army, the Royal Navy and the Royal Air Force have changed to a NATO (North Atlantic Treaty Organisation) role with all-regular forces.

This means that the men themselves have to be trained to a very high standard and the equipment they use has to be designed and built for maximum efficiency.

Like the rest of the world Britain has been hit by inflation and for this reason every ship, aircraft, weapon and vehicle requirement must be subjected to the closest scrutiny and control. Budgets have become too tight for ad hoc experimentation. What is ordered and put into production has to work and work well.

## Very Adaptable

Of the army's total of 177,000 men, some 55,000 are in the British Army of the Rhine (BAOR). Formed as one corps, this consists of five armoured brigades, one mechanised brigade and two artillery brigades and two armoured reconnaissance regiments. Full regular and volunteer reserves in the British Isles are organised for rapid reinforcement of BAOR in an emergency, together with mobile reinforcement of the NATO flank areas.

Equipment for the modern British Army reflects these commitments and although extremely adaptable is mainly designed for use under European conditions.

Britain has the longest continuous record of fighting-vehicle production of any nation and the experience is embodied in her armoured fighting vehicles latest (AFUs).

## Main Battle Tank

One of the standard weapons in the armoury is the Chieftain Main Battle Tank (MBT). Since World War II Britain has concentrated on tank

development based first and foremost on firepower, followed by armour protection and then mobility.

Following the highly successful Centurion tank with its 105mm gun — the latter in use in many countries

— the MBT evolved as the Chieftain with a 120mm gun. This combination gives firepower superior to any other tank currently in use.

The 120mm gun with Armour Piercing Discarding Sabot (APDS) ammunition is capable of killing opposing armour at ranges up to 4000 metres. With High Explosive Squash Head (HESH) ammunition, fortifications, troops, armour and soft-skinned vehicles can also be successfully dealt with.

Rate of fire is 10 rounds/minute for the first minute and 6 rounds/minute thereafter. The 0.5 inch (12.7mm) ranging machine system is being supplemented by a

*Scorpions of the 14th-20th King's Hussars operating in the Harz mountains of Germany during a major BAOR exercise. The British Army's latest armoured reconnaissance vehicle, the Scorpion was built by Alvis Ltd and developed for use in conditions demanding high power-to-weight ratio, low ground pressure and positive traction over bog, swamp and snow. It is the first British fighting vehicle built almost entirely of aluminium and carries a 76mm gun mounted in a 360-degree traverse turret.*



*The short-vertical takeoff and landing aircraft — the Hawker Siddeley HARRIER*

Barr and Stroud laser rangefinder usable out to 5000 metres in clear weather. Full night vision equipment is included.

## High Immunity

Chieftain has good all-round sloped armour but it is particularly heavy in the vital frontal area, which gives it a high degree of immunity at the closer battle ranges. With a weight of 53,850kg and a 730 shaft horsepower (shp) (544kW) 1 Leyland L60 engine, the Chieftain can achieve 48km/h road speed and 30km/h average across country.

As the lightweight air-portable complement to Chieftain, the Alvis-British Leyland Scorpion light tank has been built with a hull fabricated in welded aluminium. Powered by a militarised de-rated Jaguar automobile engine of 4200cc, Scorpion is capable of a maximum road speed of 80.5km/h and it is very agile over all types of terrain.

Armament consists of a lightweight version of the well-proven British 76mm gun in a 360-degree traverse turret with a co-axial 7.62mm machine gun. HESH, high explosive, canister, illuminating and smoke ammunition are available and 40 rounds can be carried.

## Variants

Scorpion forms part of a family of vehicles based on the same basic chassis. Other variants include Striker with five (+ five spare) Swingfire anti-tank missiles; Spartan, the seven-man armoured personnel carrier; Sultan command vehicle; Samaritan ambulance; Samson recovery vehicle, and

Scimitar anti-APC and anti-aircraft version.

The last mentioned is equipped with the new 30mm Rarden gun which can fire a highly lethal APDS round. This weapon is also fitted to the four-wheeled Fox light armoured reconnaissance vehicle which is a development of the Ferret and, like Scorpion, has a welded aluminium hull.

As a replacement for the famous 25-pounder (11.3kg) gun howitzer which spanned 30 years, the British army now uses the Abbot self-propelled 105mm gun with 360-degree traverse. Half a ton of shells can be fired per minute with high accuracy over ranges from 2500m to 19,000m by day or night.

## Latest Gun

The latest artillery piece to go into service with the British Army this year is the 17,400m range 105mm light gun which fires the same varieties of ammunition as Abbot — high explosive, white phosphorus, base ejection smoke, HESH, target marker and illuminating. Total gun weight is 1768kg and sustained rate of fire is three rounds a minute. Basic towing vehicle is the new one-ton Land Rover while the gun can be carried on an Andover aircraft or suspended beneath Sea King and Puma helicopters.

Now in large-scale service as the standard anti-tank missile is the British Aircraft Corporation's (BAC) wire-guided, vehicle-mounted Swingfire. Advantages of this system are its short (140m) and long (full 4000m) range capability, the lethality of its hollow charge warhead

and the fact that the launcher can remain hidden while the operator is positioned up to 100m away.

## Anti-Aircraft Missiles

For defence against low-flying, high speed aircraft both the Army and the RAF are equipping with the BAC Rapier missile system. Highly mobile, Rapier can be operated and fired by one man, while only five men are needed for continuous running. For all-weather operation, blind-fire Rapier is available which can be incorporated into battery operation.

A new range of combat net radio equipment is coming into service. Known as the Clansman range, this comprises very high frequency (VHF) and high frequency (HF) radios which are fully synthesised and include one manpack and two vehicular HF sets and three manpack and one vehicular VHF sets. The radios can be used as a total system, as in the British Army, or individually to meet specific requirements.

## Detection By Radar

Special attention has been paid by the army to battlefield detection, night vision and ground surveillance. In the last mentioned category British Army Radar GS.14 Mk.1 (28298) has been adopted as standard. This set can detect, recognise and provide accurate position on moving targets and their direction from 50m to 10,000m.

The complete equipment can be carried by two men and in addition is mounted on a wide range of military vehicles.

Other recent developments include a high range-weight ratio 81mm mortar, Cymbeline — a light-weight locating radar — a variety of day and night sights for rifles and machine guns and explosive detectors.

#### Front-line Aircraft

Air support is absolutely vital for army operations in any theatre. In recent years the RAF has devoted much of its energies to building up a strong force of strike-reconnaissance aircraft.

The latest type in this category is the SEPECAT Jaguar, a joint Anglo-French aircraft which is already in front-line service in France and with which eight RAF squadrons are to be equipped.

Capable of speeds exceeding Mach 1.5 at altitude, the Jaguar is powered by two reheated Rolls-Royce-Turbomeca Adour engines with a wet thrust of 3350kg each. The aircraft has a sophisticated navigation-attack system based primarily on the use of an inertial platform. A laser range-finder and marked target seeker is also fitted.

Two 30mm guns are carried and up to 10,000lb (4500kg) of bombs.

rockets or guided missiles. A full reconnaissance pack is also available. Jaguar can operate from rough, unpaved strips and has lo-lo-lo (low approach, low attack and low return) radius of action of 450 nautical miles.

#### The Remarkable Harrier

The second standard type strike-reconnaissance aircraft in RAF squadrons is the remarkable short-vertical takeoff and landing Hawker Siddeley Harrier.

This aircraft with its vectored thrust Rolls-Royce Pegasus engine can operate from bombed runways or dispersed from any small open space. Harrier is highly flexible in use and, with thrust vectoring in flight, it presents an extremely difficult target to pinpoint and destroy.

Normal weapon load is 4000lb (1800kg) but this can be greatly increased for longer takeoff runs. Like the Jaguar, it is fitted with two 30mm Aden guns and has an inertial navigation-attack system. Harrier is equally at home on land or at sea and in the latter case it can operate in a variety of roles from carriers or ship's helicopter platforms. Speed at low altitude exceeds 1186km/h

while, with one in-flight refuelling, range is more than 5560km.

#### For the 1980s

For the 1980s the RAF will replace its Buccaneer and Phantom aircraft with the Multi-Role Combat Aircraft (MRCA) which is being jointly developed by Britain, the Federal Republic of Germany and Italy. The prototype of this versatile variable geometry wing aircraft is nearing the flight test stage at the time of writing.

Finally, one cannot leave this brief review of modern British military equipment without reference to the rotary wing field.

Recently ordered into full production is the twin-engine Westland-Aerospatiale Lynx which will be used by all three services. The general purpose version for the Army (Lynx AH Mk 1) can carry up to ten soldiers in its high density configuration or up to 907kg of freight.

Maximum cruising speed is 296km/h at sea level.

Lynx represents a major step forward in helicopter design as it has a semi-rigid rotor, conformal gears and an automatic flight control system.

## BOOK REVIEW . . .

### THE COLLAPSE OF POWER: MUTINY IN THE HIGH SEAS FLEET

By David Woodward

Published by Arthur Barker, London, 1973. 240 pages.

Review copy supplied by HICKS SMITH & SONS PTY LTD, SYDNEY. Review by the late LIEUTENANT COMMANDER B. R. NIELD, RANR (Retd).

Mr Woodward, after a long and varied career in journalism all over the world, has made his mark as a writer of books about less obvious aspects of naval history. In this book, which is free from footnotes but based on much research, he tells the story of the German naval mutiny of 1918, which occurred shortly before the armistice.

This story is mysterious and fascinating, and Mr Woodward does it justice in this vivid account. He weaves around this episode a background of naval strategy, German

political history and German naval history from 1897 to 1945.

His book can serve, then, as an introduction to these subjects. The best short history of naval operations of the First World War is probably Geoffrey Bennett's book *Naval Battles of the First World War*, now available in paperback.

The mutiny was provoked, according to the mutineers, by orders of the German naval command to go to sea to engage the Grand Fleet, against

which it apparently had no chance of survival years later, the mutineers claimed that the admirals had mutinied by ordering the operation, presumably to destroy the fleet, without even telling the German government. Mr Woodward discounts their claim, but the evidence that he presents, particularly about the scuttling of the German fleet in 1919, tends to support their claim, not to refute it.

The German navy, as he shows,

fought well and carried out operations efficiently almost to the end of the war. The mutiny was highly organised, so much so that previous planning must have been made. It is likely enough that the plans envisaged the establishment of a Soviet Germany, and that the naval mutiny was intended to be, like the Russian naval mutiny of 1917, the first act of a general revolution.

In this century the German navy has had an uneven history — as appears in the career of Raeder, who was first a commander, then the official war historian, then Grand Admiral. The navy rose again suddenly to become a formidable force under the dictatorship of Hitler. The leadership of Donitz and Raeder certainly deserves study for its initiative and imagination.

During the Second World War, the navy had a very high morale. There was no mutiny, and it fought to the end.

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## The Longest Voyage

# Submarine Sets Record

The Oberon class submarine HMAS ONSLOW.



An Oberon class submarine, HMAS ONSLOW, recently set a record for the longest continuous period at sea for an Australian submarine. She sailed from Sydney on 2 June, participated in Exercise Kangaroo I, made a 3500 mile passage to the Gulf of Thailand, participated in a second International exercise, then finally touched land again at Bangkok 33½ days later.

The previous longest continuous time at sea for an Australian "O" boat is about three weeks on a delivery voyage from the UK.

According to ONSLOW's captain, Lieutenant Commander Rod Fayle, the record-breaking voyage was largely uneventful — in fact nobody seemed to realise ONSLOW had set a record until some time after the submarine had arrived in Bangkok.

Despite the submariners' nonchalance the first part of the voyage reads like an American Second World War movie. "We sailed from the submarine base HMAS PLATYPUS in Neutral Bay for Exercise Kangaroo I on 2 June and commenced our initial patrol in the vicinity of Cape Byron two days later. Here we attacked a surface action group of British ships including the County Class guided missile destroyer HMS FIFE and the frigates ARIADNE, SCYLLA and ARGONAUT early in the morning. They didn't spot us. SCYLLA passed within 1000 yards — we must have sunk her. Then we carried out a long range

attack on another of the frigates."

And so the narrative goes on. Hunting Neptune and Orion maritime reconnaissance aircraft failed to find the submarine, a mine field was laid in the Shoalwater Bay Exercise area (with the submarine still undetected), and a periscope reconnaissance was carried out in the area where the surface ships were carrying out practice gunnery.

Some of the underwater transits had been specifically programmed to exercise the sophisticated electronic detection devices carried by the hunting aircraft. But the submariners did not make it easy for the air force. They could choose their own route between the two fixed points and on one occasion ONSLOW escaped detection by slipping through a hole in the Great Barrier Reef less than 200 yards wide and with only 20 feet of water under her keel.

When the big amphibious landing by US marines commenced ONSLOW was waiting. After slipping undetected through several "layers"

of destroyers escorting the big landing ships the submarine carried out simulated torpedo firing at the USS JUNEAU and the USS BRISTOL COUNTY. When the green smoke grenades indicating a simulated torpedo firing popped to the surface "all hell broke loose" but ONSLOW succeeded in evading her hunters and "retired for routine exercises".

It was during this phase that ONSLOW was detected by the "enemy" for the first and only time. The submarine was required to operate on the surface for a period and her attackers watched her dive. "That was quite an exciting day," recalls Lieutenant Commander Fayle. "We spent about 18 hours being chased all over the ocean by ships and aircraft before we finally slipped through the screen and were able to attack the ships withdrawing the marines from the beaches. I didn't leave the control room all day and I was pretty well exhausted by the end of it."

That was on 17 June. For most, two weeks of continuous exercising

would be enough. For ONSLOW however, it was merely the end of a "fairly routine exercise" and the beginning of phase two of her long voyage.

"The passage to the Gulf of Thailand was all on the surface at about 10½ knots. The weather was kind to us and we could relax a bit," recalls Commander Fayle. "We set up a big canvas swimming pool on the forward casing, and we sunbaked a bit. The "keep fit" fanatics ran a mile a day 32 tiny circles around the deck."

What else do you do in a submarine on long surface passage?

"Well we had 14 movies aboard, we played cards and tombola. One of the sailors organised a "cabaret" along the lines of the club in the movie. Everyone got dressed up in costumes made from old rags, and we used chinagraph pencils for makeup. Every mess had to contribute a couple of acts and some of the chaps even composed their own songs."

"We even had a barbecue about the northern end of Borneo. We discovered an uncharted reef where we stopped and caught about 30 pounds of reef fish. They were beauti-

ful barbecued."

But it is not all fun and games on a long passage. For instance a submarine being diesel rather than steam powered cannot make so much fresh water. To keep clean you have the choice of a salt water shower with a marvelous invention known as "salt water soap" (which does in fact produce a lather), or opt for the "bird bath routine" — you are issued with about a pint of fresh water and not only do you bath in it, you clean your teeth and wash your clothes as well — although not necessarily in that order. Submariners have no problems ashore during summer water restrictions!

The only way to get a decent bath is to sail into a tropical rain storm. ONSLOW ran into two. Virtually the entire crew stripped off their uniforms, and rushed out onto the casing wielding cakes of soap. Even the officer of the watch — the man responsible for running the boat at the time — stripped off his uniform and stood on the bridge brandishing a bar of soap, stark naked except for a much needed layer of lather.

Food is another problem as after two weeks at sea the chefs have no more fresh food to serve. Despite this submariners' fare is remarkably good, except perhaps for the tinned potatoes which are a little hard to disguise. The statistics for the voyage indicate something about what submariners eat as well as how much: 1280 pounds frozen meat, 80 tins of baked beans, 200 dozen eggs, 320 tins of fruit juice, and 400 pounds of bread, but the bread lasted only for the first two weeks.

Fresh news is almost as short as fresh food in a submarine on a long passage. The crew had no mail for four weeks. A brief bulletin of Australian and world news is received by signal each day and

eagerly devoured by the crew, and the Navy's signal system (operating through the American transmitters at North West Cape when the submarine is dived) can be used to transmit important items of family news. One of ONSLOW's sailors learned that he had become a father of a baby boy on the way from Australia.

What was everybody's first thought on reaching Bangkok about midday on 5 July? "I know that personally I got as quickly as I could to a hotel, had about three baths, four showers, and five massages. I was the cleanest body you had ever seen. Then I ate piles of fresh fruit, and dumped loads of filthy washing into the hotel laundry," said Commanding Officer Fayle.

Five weeks is far from ONSLOW's limit of endurance. The Royal Navy does regular six week patrols in this class of submarine, and the boats are designed to stay at sea for eight weeks at least in wartime. The limit of endurance, like a nuclear powered submarine, is human rather than mechanical. An "O" class submarine could stay at sea for 12 weeks continuously if false decks of food were built inside the ship and the crew literally ate their way through to the floor. ONSLOW could sail half way around the world without refuelling if necessary.

ONSLOW's long voyage is testimony to the high quality of the maintenance work done by Australian sailors on our "O" class submarines. ONSLOW was due to be docked for an extensive refit about the end of last year, but for various reasons this could not be carried out. A survey of the submarine revealed that it could operate safely for 12 months more than the builders' specifications, and this five week trouble free run has proved that ONSLOW and her crew are in very good shape indeed.



Lieutenant Commander Rod Fayle, RAN, is the commanding officer of HMAS ONSLOW.

### CONTRIBUTIONS INVITED

The editor invites persons to submit articles, photographs, letters, etc., for inclusion in the magazine, but must state that no payment can be made for material submitted. Contributions should be addressed: The Editor, The Navy, c/o Charles Street Post Office, Sydney, N.S.W. 2006, Australia.

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*This Westland Sea King anti-submarine helicopter was the first of 10 on order for the Royal Australian Navy to fly in Yeovil, U.K., recently where the helicopters are being built. The Sea Kings will replace the Wessex helicopter which entered service with the RAN in the anti-submarine role in 1962. The Sea King is a large sophisticated machine with an advanced automatic flight control system and is fitted with sonar, radar and tactical displays. It has a crew of four — two pilots, an observer and an aircrewman.*

## SEA KING:

# Sub-Hunter Supreme

For most of 1971, I served as an instructor at the Royal Naval Anti-Submarine School. This is at RNAS PORTLAND, on the south coast of England, where I underwent part of two years' exchange service with the Royal Navy.

By Lieutenant  
Commander  
R. M. Jones

The primary role of the school and the associated 737 Naval Air Squadron was to train Royal Naval aircrews in the tactical use of anti-submarine helicopters. 737 Squadron operated Wessex HAS Mark 3, primarily for use from the County Class destroyers although some were still in service in the Blake Class cruisers, and the Sea King HAS Mark 1, then coming into general use throughout the Royal Navy.

The arrival of the Sea King in embarked service in the Royal Navy caused a drastic re-think of many people's appreciation of the value of helicopters. A similar reaction is bound to occur to the introduction of the Sea King into service in HMAS MELBOURNE. The Westland Sea

King is so far ahead of any other anti-submarine helicopter that comparison is difficult and the Australian version promises to be even more versatile than the Royal Navy's Mark 1.

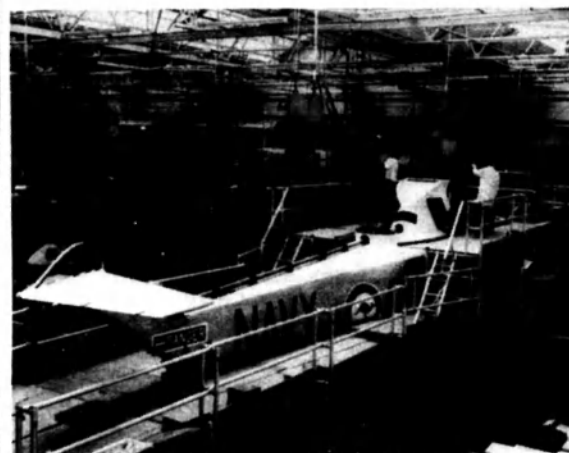
### FLEXIBILITY

The major eye-opener, at least initially, will be the speed and endurance. Instead of arriving in the middle of an anti-submarine exercise, staying for an hour or so, and then leaving again before the exercise is completed, a Sea King can arrive first, dive the submarine, exercise with the ships (when they arrive) and then stay around to surface the submarine after the ships have gone on to their next exercise three and a

half or four hours later.

A higher speed while in transit to datums and screening stations also makes for more effective use of the aircraft.

Operations at ranges far in excess of the present limit to anti-submarine helicopters from NAS Nowra will also be feasible. In one Joint Unit Course in the Moray Firth in Scotland, 737 Squadron embarked aircraft in RFA TIDESPING and had an additional aircraft operating from RNAS LOSSIEMOUTH just over one hundred miles away. A Sea King from LOSSIEMOUTH was flying out directly to the submarine operating area, exercising for two or three hours, then still with sufficient fuel to return to shore, landing on TIDE-



*The Sea Kings, being built under a 10,000,000 pound contract, will be used in the anti-submarine and vertical replenishment roles. Firm: Westland Helicopters Limited, Yeovil, England.*

SPRING for fuel before returning to the anti-submarine exercise for a further couple of hours, then returning directly to LOSSIEMOUTH.

### CAPABILITIES

More effective use of the aircraft is also ensured by a more reliable flight control system, the "black boxes" which allow an anti-submarine helicopter to remain in a steady hover over a dunking sonar body, for hours on end if necessary.

The flight control system Mark 31 installed in the Sea King is the end product of a series of such systems stretching back to the Whirlwind and Wessex One. It will allow the aircraft to descend to a 40-foot high hover, remain there as long as required, then climb back up to the transit height of 200 feet, in any weather, by day or night.

While the aircraft vibrates to a certain extent, especially while letting down to the hover, there are none of the sudden jumps and bumps which can occur so frighteningly with earlier flight control systems.

The heart of the Sea King, as an anti-submarine unit, and the reason for its outstanding success, is the navigation system. Unlike his Wessex 31B contemporary who is still

plotting information on a piece of perspex, the Sea King observer sits at a sloping console incorporating a 17-inch diameter display with overheard instrument-switch panel.

Displayed on this console is the radar picture while sonar contact

information can be transferred from the sonar alongside the radar by the sonar operator keeping a strobe aligned with the sonar contact. The observer places a transparent plastic overlay containing navigational information such as exercise areas, known non-submarine sonar contacts or land, on top of the display and is then ready to begin thinking tactically.

To further enhance the system, and make the observer into more of a tactician than a navigator, is the doppler navigator. Instead of the older method of navigation in which the wind is found then the effect on the aircraft is calculated, the doppler finds the true motion of the aircraft by reference to the ground or water and applies it directly to the radar picture. Then the radar picture moves around the display as the aircraft moves.

Such a self-contained system operates equally well within sight of land or ships or in the middle of the ocean a hundred miles from the nearest ship.

## AIRBORNE OPERATIONS ROOM

Effectively, such equipment constitutes a one-man operations room with all radar and sonar contact information being supplied to one man without intermediate opera-

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tors; this man (the observer) also has use of the radio and direct supervision over his one-man "sonar control room" immediately beside him.

While such an organisation requires a very high standard of training for the observer, it also forms an extremely efficient operations room. With such a system in operation it is quite feasible for the helicopter to be in the position to direct the co-operating ships, a somewhat unusual situation for the RAN.

The doppler navigator is particularly useful when working from a shore base or when taking part in entry or departure screens as the Sea King does not have to rely on any outside agency for navigational assistance. The display can be set up so that the entire exercise takes place within the 17-inch diameter area available. When necessary the plot can be reset by re-aligning the radar picture to coincide with the land shown on the overlay.

### LONGER-RANGE OPERATIONS

Longer transits, such as those carried out to an exercise well out to sea, can also be safely and accurately carried out independently. Using a small scale (10 miles to the inch) on the radar the Sea King navigates to the area concerned. Once there the overlay is changed and a larger scale more appropriate to anti-submarine warfare is selected (one or two miles to the inch).

When the exercise is completed and the homeward leg begun, the original scale is selected and navigational information which has been stored in the doppler memory, and up-dated during the flight, is presented for the trip back to base.

### SAR CAPABILITIES

Such navigational capability also has obvious applications to search and rescue or medevacs. A flight from up to 200 miles out to sea with an injured sailor is no longer uncommon.

As part of the normal operational flying training, 737 Squadron embarks in the helicopter training ship RFA ENGADINE, and during one of these embarkations a sailor with suspected internal injuries resulting from a fall on board an escorting frigate was picked up from his ship in a litter.

The aircraft flew him 200 miles to the nearest hospital, in south-western England. The sailor rapidly received hospital treatment and the Sea King was back a few hours later, having missed out on only a few hours of exercises. The alternative was detaching the frigate for up to two days to go to the nearest port, land the sailor and return.

The same navigational system, with well over 90 per cent accuracy over water, allows the Sea King to play a conspicuous part in searches for survivors of wrecks or ditchings. Once found, survivors can be hoisted by the hydraulic rescue

winch, if necessary making use of the flight control system to keep the aircraft in a steady hover.

For night winchings the "back-seat crew" have control of the aircraft and use a small control stick just inside the cargo door to "fly" the aircraft over the survivor in the water. This small control stick has very limited authority horizontally and cannot alter the aircraft height. Nevertheless it contributes greatly to smooth and quick winchings. The major problem with it is the psychological one of pilots becoming rapidly unsettled at the idea of observers flying the aircraft, especially from the cabin.

### AUSTRALIAN SEA KING

The RAN Sea King Mark 50 will have a more powerful engine, an additional blade in the tail rotor for better directional control, American sonar similar to that already installed in the Wessex 31B, and the ability to transmit sonar information directly to shipborne Ikara computers.

*Commodore D. W. Leach, Royal Australian Naval representative in Britain, jokes with Mr Bill Baxter, Works Director, Westland helicopters, Yeovil, Somerset, as they inspect one of the two Sea Kings nearing completion for the Royal Australian Navy.*

*The Australian Government has ordered ten Sea Kings, worth more than 10 million pounds, which will be used by the Royal Australian Navy in the anti-submarine and vertical replenishment roles.*

*The Sea Kings are powered by two up-rated Rolls-Royce Gnome H1400-I turbines (an increase of 130shp on the H1400) giving increased performance at altitude and in high ambient temperatures. The aircraft have an up-rated transmission system to harness this increase in power and a new design of tail rotor.*

*Anti-submarine warfare equipment including the surveillance radar in the Australian machine is the same as that in Royal Navy aircraft apart from the sonar and communications equipment which is to Australian requirements.*

*At a maximum weight of 21,000lb the fully-equipped Sea King (including sonar, weapons and four crew) is capable of at least four hours duration on station.*



As well as the standard Westland Sea King radar and doppler navigator, additional radio navigation aids such as Tacan will make the RAN's newest aircraft the most versatile version of the Sea King in use.

## New Workhorse for The Moresby

The Fleet Air Arm has brought into service the Bell Kiowa helicopter which will have a very specific task — support of the RAN's hydrographic survey ship HMAS MORESBY.

For 10 years MORESBY has charted the coasts and nearby waters of Australia with the help of Westland Scout helicopters. Two Scouts were acquired in 1963 for MORESBY which herself came into service in the following year.

One of the two Scouts was withdrawn from service several years ago, but the other has gone to sea with MORESBY on each of her voyages. Now, the Scout has reached the end of its economical life. Its place is being taken by two Bell 206B-1 light observation helicopters.

The main role of the helicopter on HMAS MORESBY is to ferry personnel ashore to set up trig positions to be used in conjunction with the survey vessel's work. Much time is saved in the supply of these positions from the air.

Personnel may also be transferred to islands to check tidal flow. Another role, although not often used is the high fix, when the helicopter hovers over a fixed point and the ship and trig points fix the aircraft's position.

For the men on board MORESBY, however, one of the most important roles for the helicopter is the light in-shore to pick up the mail and newspapers.



*The Bell 206B-1 Kiowa light observation helicopter now in service with the RAN.*



*The Navy's Scout helicopter, which has been replaced by the Bell Kiowa.*

The Bell 206B-1 will also have a limited search and rescue role. It is fitted with a rescue winch capable of lifting 300 lbs.

The Bell 206B-1 is the same machine as those being acquired for

the Australian Army. A contract for 75 of the helicopters, which are similar to but not exactly the same as the Bell Kiowa (used by the US Army), was awarded to Bell Helicopter Australia Pty Ltd, of Bris-

bane, in 1972 and they are being constructed by the Commonwealth Aircraft Corporation Pty Ltd, Fishermen's Bend, Melbourne, under contract to Bell.

The Army has already received a number of its order.

When Navy was looking around for a replacement for the Scouts, it considered a number of aircraft. But the Bell 206B-1 had much going for it.

### For Instance:

- the aircraft readily available;
- spares were being produced in Australia; and
- support services for the aircraft would be readily available.

Another fact was that the two aircraft acquired by Navy were originally part of the Army order. The Department of Defence agreed to an inter-Service arrangement by which two aircraft could be transferred to Navy together with a major part of the support package.

The first aircraft started flying on November 21 at the Naval Air Station, Nowra, NSW. The second arrived in June.

The machines — painted in the Navy colours blue and white — are part of HT 723 Squadron, to which the Scouts had been assigned. The squadron's functions are helicopter pilot training, search and rescue operations, and Fleet support duties. It is also equipped with Bell Iroquois aircraft.

The Navy versions of the new helicopters are slightly different to the Army aircraft.

They are equipped with rotor brakes — necessary on board ship because a rotor must be stopped quickly to avoid danger to personnel. In an open field the crew and passengers can get out and walk well away. But on a small helicopter landing pad on board ship this is not easy to do, and the strong, variable winds which blow around a ship can make helicopter blades behave in unexpected ways.

The Navy aircraft also have main rotor blade "flap restrainers" which limit the amount of blade flapping during rotor shutdown — another danger on board ship.

They also have high tie-down points (as distinct from low tie-down points on the Army machines), so that Navy handlers will not have to scramble under the aircraft to tie them down to the deck.

Lastly, the Navy Bell 206B-1s will have low skid gear so that they will fit into the hangar on MORESBY. Wheels can be fitted by ground-maintenance personnel for easier handling. They are removed before flight.

The Bell 206B-1 is also related to the civilian Jet Ranger, which has seen a lot of work in many parts of the world. It is also being built in Australia by Commonwealth Aircraft Corporation for Bell.

Briefly, basic statistics of the Navy's new aircraft are:

Engine: Allison 250-C20 turbo-shaft, producing 400 shaft hp.

Speed: Max. 120 knots; cruising, 110 knots.

Range: About 300 nautical miles.  
Max endurance: About four hours.  
Weight: 1450kg (all up); max weight with external load, 1630kg.  
Length: 12.48 metres.  
Height: 3.23 metres.  
Rotor diam: 10.77 metres.

Crew: Pilot and one crewman.  
Total seating capacity, five.

The basic statistics of the Scout Mark 1 Series 1 general purpose helicopter are:

Length: 12.29 metres.  
Height: 2.87 metres.  
Width: 2.54 metres.  
Rotor diam: 9.83 metres.  
Crew: Pilot and one crewman. Up to three passengers.

Empty weight: 1530kg.  
Max takeoff weight: 2630kg.  
Cruising speed: 83-85 knots.

Engine: Bristol Siddeley Nimbus turbine engine developing 600 shaft hp.

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## PATROL FRIGATE PROJECT



*An artist's impression of the United States Navy's Patrol Frigate, two of which are to be constructed for the Royal Australian Navy.*

On 29 August, the Minister for Defence, the Honourable Lance Barnard, signed an agreement in Washington with Mr William Clements, United States Deputy Secretary for Defence, which is the first stage of the planned purchase of two patrol frigates for the Royal Australian Navy (see photograph).

The Australian Government had announced in April this year its intention to buy the patrol frigates subject to the negotiation of satisfactory financial and contractual conditions. The ships are expected to be delivered in 1981 and early 1982.

The patrol frigate agreement broadly covers important commercial aspects of the patrol frigate buy. The agreement will put the Australian Government into the same position as the United States in assessing the technical and financial progress of the USN patrol frigate programme. The agreement includes earlier understandings that

Australian industry would be given every opportunity to win offset contracts.

The agreement provided safeguards for the Australian Government if there was any technical shortfall in the performance of the frigates or there were cost escalation factors of a scale which could be unacceptable to Australia. The agreement gives Australia adequate options for cancellation.

The United States Defence Systems Acquisition Review Council would be reviewing all technical data, as well as projected costs before a firm decision was made by the United States Government to go

ahead with the construction of the US Navy patrol frigates.

The Australian Government will have access to all the pertinent material and data which the Council will use in reaching its decision. The Australian Government will then make its own independent assessment of the technical and financial viability of the patrol frigate programme.

Members of the Royal Australian Navy and other technical experts from Australia will be sent to the US to participate in the US Navy patrol frigate project and will work closely with the USN development of the programme.

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## One tree doesn't make an orchard

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



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NOVEMBER-DECEMBER-JANUARY, 1974-75

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# Navy

A black and white portrait of Vice Admiral Sir Richard Peek. He is a middle-aged man with light-colored hair, wearing a dark naval officer's uniform with a white shirt and dark tie. On his left chest, there are several rows of medals and ribbons. He is looking directly at the camera with a slight smile. The background is dark and out of focus.

Vice Admiral Sir Richard Peek, KBE, CB, DSC, author of the special article commencing on page 2 — Australia's Maritime Defence Forces — What We Have, What We Should Order Now, And What We Should Be Planning To Order Soon.



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**NOVEMBER-DECEMBER-JANUARY, 1974-75**

**No 4**

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**Nov/Dec/Jan, 1974-5**

**THE NAVY**

**Page One**

# THE MARITIME DEFENCE FORCES

## *What we have, What we should order now, and What we should be planning to order soon*

By: Vice-Admiral Sir Richard Peek, KBE, CB, DSC

**Maritime defence forces are ships, submarines and aircraft which operate and, if necessary, fight, on, under and over the oceans.**

In Australia in peacetime they are the visible evidence that we are prepared to defend our territories and our resources and have the capability to do so. They must have weapon systems which will be appropriate to defend Australia against any hostile forces which may attack us and they must have the long range necessary to patrol our very long sea frontier.

It is beyond argument that the primary defence forces of a nation surrounded by hundreds or thousands of miles of ocean should be maritime, because it is **only** from or over the ocean that such a nation can be threatened. Australia is one of the very few nations which has no land frontier with any other nation and has a very wide ocean frontier. It has been argued that being surrounded by the sea no longer ensures our security now that we have to provide for our own defence instead of relying on allies. But surely it must be to our advantage to defend Australia at sea rather than on Australian soil, where we would suffer the double disabilities of a small population and an enormous stretch of coastline to defend. I firmly believe that being an island continent adds very much to our security — provided that we maintain adequate maritime forces.

Such forces need people and equipment. Over many years we have shown that we can recruit and train the dedicated people to operate this equipment efficiently. Until the



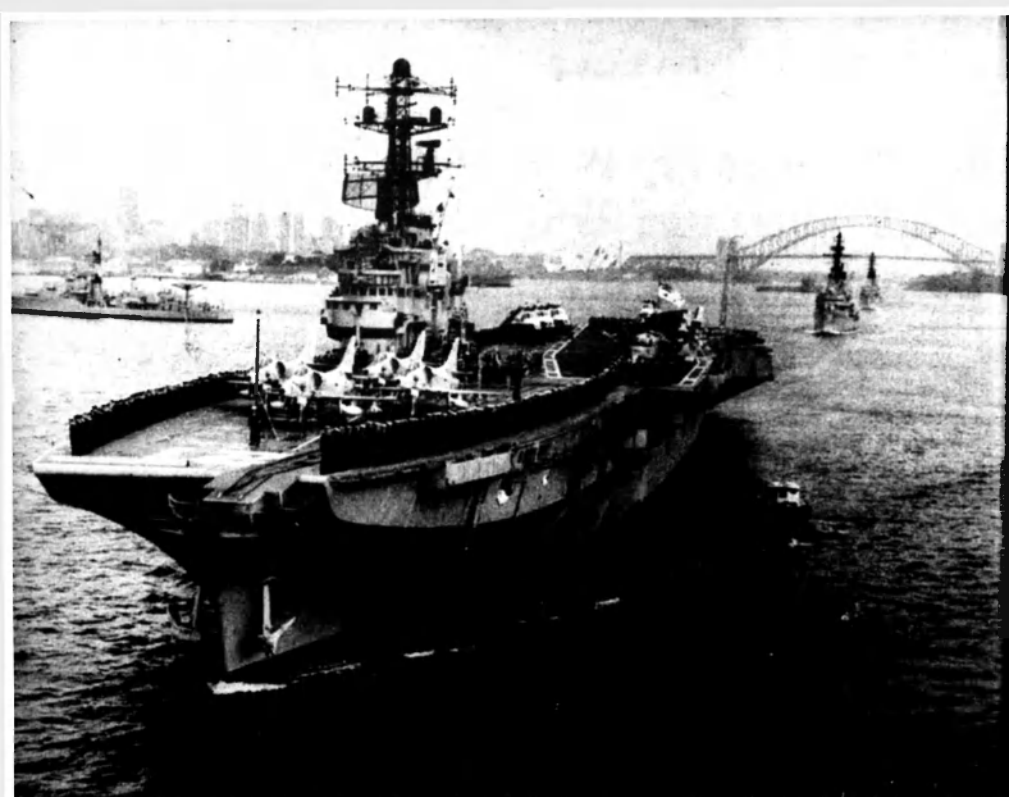
*One of six frigates of the River class, HMAS YARRA was built at Williamstown Naval Dockyard, Victoria, launched on 30 September, 1958, and commissioned on 27 July, 1961. She is to be downgraded from a fleet escort to a training ship at a time where there is no replacement for her in the operational role.*

**THE NAVY is pleased to publish in this issue a paper on Australian Maritime Defence Forces prepared by one of Australia's most forward-looking Admirals, Sir Richard Peek.**

The crux of Admiral Peek's argument is that given Australia's exposed position in a highly volatile world, we must demonstrate an ability to look after ourselves, and that the logical place to do this is at sea rather than on the land.

A credible maritime defence capability is however dependent upon modern equipment in the form of ships and aircraft. In this regard the decreasing proportion of the defence vote allocated to equipment, and the large manpower costs, seem at variance with the real requirements of Australian defence.

Admiral Peek's attainments and reputation for plain speaking ensures that his paper will be studied carefully by all those who have the long-term interests of our country at heart. We hope it will prompt some realistic decisions in the matter of defence equipment.



*The aircraft carrier HMAS MELBOURNE, flagship of the Royal Australian Navy since 14 May, 1956. MELBOURNE was laid down as HMS MAJESTIC on 15 April, 1943, launched on 28 February, 1945 and commissioned into the RAN on 28 October, 1955. She carries Skyhawk fighter-bombers; Grumman Tracker anti-submarine warfare aircraft.*

last six or seven years, approval for new equipment was given fairly regularly and, although the situation was not perfect, we had built up a small, modern, efficient maritime force. Approval for two major equipment proposals given in the late 1960s, and confirmed in the early 1970s, was unfortunately cancelled by Cabinet on Mr Barnard's recommendation in 1973.

Before listing what we have now, and suggesting what we should be ordering, it may be of value to list some of the more important

characteristics of maritime equipments:

(a) The force is capital intensive. Individual equipments are expensive. Even in a period of very high inflation which makes monetary comparison with the past difficult, the complexity of the systems with which ships and aeroplanes must be fitted, if they are to have a fighting chance against potential aggressors, means that they will be very costly in absolute terms. But surely no one would suggest that we again ask our pilots to fight Zeros with Wirraways, or

that we should ask our sailors to go to war in ships as old and decrepit as the Scrap Iron Flotilla was in 1940.

(b) They are long lasting, if properly maintained and regularly refitted. They do need to be brought up to date periodically so as to be able to offer defence against new weapons. It has been the aim for many years to carry out these modernisations at "half life" and to ensure that there is ten years useful operational life remaining in a ship on completion of modernisation.

The "life of type" is variable because of many factors but broadly

speaking the bigger the ship or aircraft the longer the life. One can expect a large naval ship to have a life of about 30 years from the time it is first launched. A destroyer type might last 25 years, a submarine 25 years and landing craft and patrol boats 12 to 15 years. One would hope to get a useful life of about 15 years from an aircraft or helicopter. However, the older a ship or aircraft is, the more expensive it is to maintain and it is not sensible to spend large sums of money trying to keep worn out units in operational service;

(c) Naval ships are built to a different standard from merchant ships. This is not because the Navy wants only the best. It is because the

functions and operating patterns of naval and merchant ships are very different. For example, naval ships have a much smaller proportion of their displacement in hull and engines, as the "cargo" they carry is weapons systems and ammunition. Naval ships have to be designed and built to take battle damage and to go on fighting.

(d) Naval ships and aircraft take a long time to design and build.

The United States Navy with its vast resources is taking seven years to produce the first patrol frigate. With a large shipbuilding industry, the United States can build more ships of the same design fairly quickly, but no matter what short cuts are taken the first of a new type

of ship takes from seven to ten years to build. There is not time to design and build new types of ships and aircraft when a threatening situation arises. The best that Australia could do would be to build to an existing design and we could only do that if we have the work force with the necessary skills, both managerial and technical, to build ships and aircraft for our defence and the infrastructure of workshops, dockyards and private industry to employ that work force.

The following table shows Australia's present maritime forces with an estimate of the end of the operational life of each unit. It is followed by presently approved additions or replacements to those forces:

*An artist's impression of the US Navy's Patrol Frigate. Two frigates are to be built for the RAN and delivered during 1981-82 (USN official photograph).*



Type/Unit	Launched	Entered Australian Service	Modernisation/ Major refit	Probable end of life as operational unit
<b>LIGHT AIRCRAFT CARRIER</b>				
Melbourne	1945	1955	1969	1980
Melbourne's fixed wing aircraft		1967/71		1982/86
Melbourne's helicopters	Wessex	1962		1974
	Sea King	1974		1990
<b>LONG RANGE MARITIME PATROL AIRCRAFT</b>				
12 Neptune		1962		1977
10 Orions		1968		1983
<b>FLEET TANKER</b>				
Supply	1954	1962		1979
<b>DESTROYER TENDER</b>				
Stalwart	1966	1968		1996
<b>DARING CLASS DESTROYERS</b>				
Vampire	1956	1959	1971	1981
Vendetta	1954	1958	1973	1983
<b>TYPE 12 DESTROYER ESCORTS</b>				
Yarra	1958	1961	1976/77	1988
Parramatta	1959	1961	1977/78	1989
Stuart	1961	1963	1978/79	1990
Derwent	1961	1964	1979/80	1991
Swan	1967	1970		1994
Torrens	1968	1971		1995
<b>GUIDED MISSILE DESTROYERS</b>				
Perth	1963	1965	1974/75	1990
Hobart	1964	1965	1976/77	1989 (oldest)
Brisbane	1966	1967	1976	1991
<b>SUBMARINES</b>				
Oxley	1965	1967	1977/79	1992
Otway	1966	1968	1978/80	1993
Ovens	1967	1969	1979/81	1994
Onslow	1968	1969	1975/76	1994
<b>SURVEYING SHIPS</b>				
Moresby	1963	1964		1994
Flinders	1971	1973		2003
<b>OCEANOGRAPHIC SHIP</b>				
Kimbla	1955	1956		1980
<b>PATROL BOATS</b>				
Thirteen	1967/69	1967/69		1982/84
<b>MINESWEEPERS/HUNTERS</b>				
Four	1955	1962		1977
<b>LANDING CRAFT (HEAVY)</b>				
Six	1972/74	1972/74		1988
<b>PRESENTLY APPROVED ADDITIONS</b>				
Sea King helicopters		Due 1974		1990
<b>SUBMARINES</b>				
Orion	1974	Due 1975		2000
Otama	Due 1975	Due 1976		2001
<b>OCEANOGRAPHIC SHIP</b>				
Cook	Due 1977	Due 1979		2007
<b>PATROL FRIGATES</b>				
Two	Due 1980	Due 1982		2007

It might be suggested that the Fill aircraft should be considered as a part of the maritime force but, so far as is known they have no anti-ship weapon, no submarine detection system, no anti-submarine weapon and no reconnaissance capability.

By 1989, which is only 15 years away, unless there are substantial new approvals for equipment in the near future, the maritime forces of Australia (including the presently approved new additions — in the hope that this time they will not be cancelled) will, at best, consist of the following ships (there will be no fixed wing aircraft) —

Stalwart	Destroyer tender	23 years in the water
Swan	Destroyer escort	22 years in the water
Torrens	Destroyer escort	21 years in the water
Parramatta	Destroyer escort	At the end of their lives
Stuart	Destroyer escort	
Derwent	Destroyer escort	
Hobart	Guided missile destroyers	25 years in the water
Brisbane	Guided missile destroyers	23 years in the water
Perth	Guided missile destroyers	24 years in the water
Patrol frigate 1	Mid ocean escort	8 years in the water
Patrol frigate 2	Mid ocean escort	7 years in the water
Oxley	Submarine	24 years in the water
Otway	Submarine	23 years in the water
Ovens	Submarine	22 years in the water
Onslow	Submarine	21 years in the water
Orion	Submarine	15 years in the water
Otama	Submarine	14 years in the water
Flinders	Small surveying ship	17 years in the water
Cook	Oceanographic ship	12 years in the water.

With a coastline as large as Australia's, with the clear, though apparently unaccepted, requirement to protect ourselves, and with the nations of the world giving no indication that they are prepared to live in peace with each other, such a maritime force would leave us open to pressure from any nation which coveted our land, our resources or our produce. Such a force would leave us with little option but to give in to this pressure, unless we could appeal successfully to some other nation for help. The possibility of getting help is remote and seems to become more remote with the passing years.

If we are to be able to resist this potential pressure we need decisions now on:

(a) A replacement for Melbourne and her fixed wing aircraft so that the ship or ships will be ready by the very early 1980s. The likely contenders are the British through deck cruiser or the US sea control ship, armed with Harrier type aircraft and helicopters;

(b) Replacements for the Neptune Long Range Maritime Patrol aircraft;

(c) Replacement for Supply with a ship able to carry ammunition and stores as well as fuel and able to

replenish other ships under way. A ship to carry out this role was approved in 1968, as an addition to the Fleet rather than as a replacement for Supply, but was cancelled in 1973;

(d) Whether there is a requirement to transport troops and their stores around Australia. If there is, we need at least two ships of the British Sir Lancelot type;

(e) Whether there is to be a bipartisan political policy on defence procurement. This seems to be a very obvious requirement and one of the early decisions should be to build as much of this construction programme as possible in Australia.

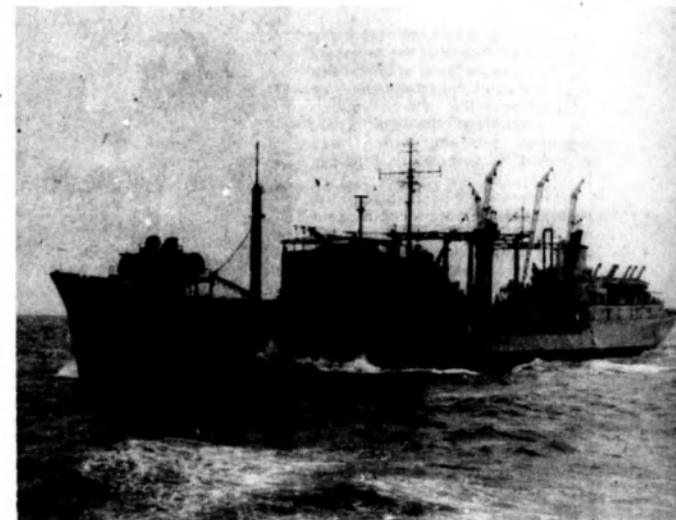
In the slightly longer term, but within the next five years, we need decisions on:

(a) Replacements for the ten Orion LRMP aircraft;

(b) A second underway replenishment ship;

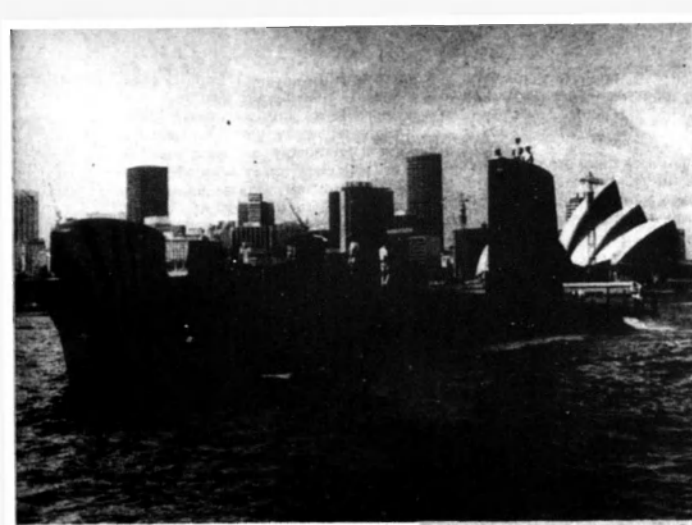
(c) A destroyer/frigate programme planned to produce a new ship every 18 months to two years;

(d) Replacements for the first four submarines;



The fleet oiler, HMAS SUPPLY. Built for Australia by Harland and Wolff Ltd, Belfast. SUPPLY was completed in March, 1955 and loaned to Great Britain until September, 1962, when she was commissioned into the Royal Australian Navy.





*HMAS OVENS, one of four Oberon class submarines forming the Australian First Submarine Squadron. Two additional submarines of this class are under construction at Scott-Lithgow Ltd, Greenock, Scotland and scheduled for delivery during 1975-76.*

(e) A new generation of patrol boats to undertake, with the aid of afloat support, the Coastguard role;

(f) A new generation of minesweepers/hunters with afloat support.

Are such programmes financially possible? I believe that the necessary money could be found in one of two ways, or a combination of them:

(a) Increase the defence vote to the percentage of the gross national product which was promised by both political parties before the 1972 elections; or

(b) Increase the percentage of the present defence vote which is spent on capital equipment from the present minute six or seven percent to about 20 percent.

The first alternative is very largely a political matter and will only come about if sufficient people are aware of and concerned about the defence of our country.

The second alternative is only partly political. If it is to happen it will require a change of attitude by the Defence Department. Since the build up of the civilian hierarchy in this department in the late 1960's, the percentage of the vote spent on "capital material requirements, machinery and plant" has fallen from 25% in 1968/69 (when we were engaged in Vietnam and had over 44,000 men in the Army) to 8.3% in 1973/74, and to an even lower figure this financial year. I believe that this

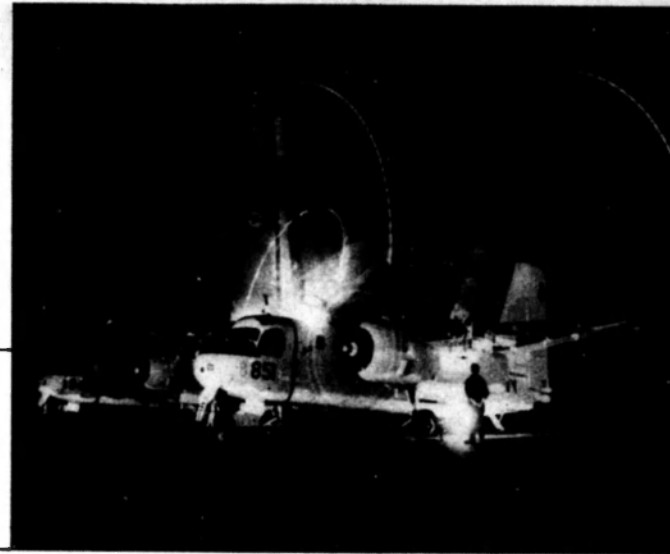


*The RAN's Skyhawk fighter bombers fly from the carrier, HMAS MELBOURNE. Photograph shows a flight deck crewman signaling to the pilot to "drop the arrestor wire".*

dramatic fall in capital expenditure has been largely caused by the continued questioning and resultant lack of decisions by civil officers in the defence Department.

The savings required for increased capital spending must come from reductions in manpower. It is out of balance for Australia to be spending 14% of the total defence vote this financial year on "civilian manpower costs" and over 18% on "Army manpower costs". Reductions in these two areas would provide the extra money to raise our capital expenditure to a more realistic figure of about 20% of the defence vote.

*A Grumman Tracker carrier-borne four seat anti-submarine attack aircraft is shown unfolding its wings before a night flight from HMAS ALBATROSS. Australia has fourteen of these aircraft.*



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# BOOK REVIEWS . . .

## STORIES OF FAMOUS SEA RAIDERS By Len Ortzen

Published by Arthur Barker Ltd,  
London.

160 pages including 2 pages of  
Bibliography  
PRICE: \$5.50

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

Reviewed by 'SHTANDART'

Continual confrontation with what is often esoteric naval literature frequently has a somewhat corrosive effect on one's ability to enjoy a good story which has been simply expressed. Couple this attitude of mine with another of basic dislike for potted naval history and the reader will have some idea of the trepidation with which I approached the reading of the book under discussion and its subsequent review.

The condensed histories to which I refer can often lead to quite erroneous interpretations and conclusions on the part of their readers by containing within their pages such items as unwarranted shrinkage of strategic information; of times gross abbreviation of what any legitimate historian would regard as pertinent detail; and these same unhallowed works even descend, on occasion, to plumbing the depths of a central characters' moral turpitude or lack of it. This sort of rubbish can be found all too often, and the genuine student who seeks valid knowledge is frequently and unwittingly led astray by those who put sensation and profit before truth.

It was with genuine regret that I came to the conclusion of this quite unassuming collection of STORIES OF FAMOUS SEA RAIDERS. Written without overt complexity mainly in the third person, this book is quite clearly aimed at either the younger student of naval history or the older reader whose knowledge in this regard is slight but who loves a good yarn.

The author has carefully chosen tales from a two-and-a-half-century wide canvass: from the privateering voyage of William Dampier in 1708 to the classic voyage of the German raider KORMORAN in 1941. In

between these epics one finds details of the maritime seige of the German light-cruiser KONIGSBERG, which fought her attackers from an impromptu anchorage in the African jungle and, in another era, one is a witness to the death of the Confederate Navy's ALABAMA which sank after losing a duel with the Federal ship KEARSAGE; a battle that was fought with much gallantry by both parties in sight of the coast of France and which was preceded by the last formal written challenge from one naval commander to another to come out of port and fight to the finish.

It is obviously impossible to record in one book all such voyages that abound, and in this regard I am reminded of a little-known incident

which concluded the almost indecently short career of Schilt 23, the German raider STIER. Of 4778 grt, diesel powered and mounting a main battery of six 5.9 inch guns, she commenced her cruise from Rotterdam on 12 May, 1942.

Four months and only three successes later, she met phyrirc success number four on 27 September which turned out to be the US merchantman STEPHAN HOPKINS, armed with a lone 4 inch rifle mounted aft. Fighting with almost unparalleled tenacity and managing to keep stern-on to the STIER, the STEPHAN HOPKINS managed to damage her attacker so severely that she (the STIER) caught fire and sank, prior to her own final plunge.

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Surely one of the most ignominious defeats in the history of the German Navy!

**STORIES OF FAMOUS SEA RAIDERS** is a work I would recommend to all. It is well-written to the point where it represents the comparatively rare feat of combining the three elements of truth, interest and brevity without resorting to spurious sensationalism.

### JANE'S FIGHTING SHIPS 1974/75

Edited by  
**Captain John E. Moore, RN  
(Retd), FRGS**

Published by Macdonald and Jane's  
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London

Reviewed by A. W. GRAZEBROOK,  
Federal Vice-President, the Navy  
League.

As in previous years, the writer awaited his copy of Jane's with keen interest. The new Editor is now in his second year of office, with the 1974/75 edition being the second he has produced. He has now coupled his experience in his first year, with his own ideas for further improvement of the book. He has produced an admirable reference work.

Improvements made include the revision to the practice of incorporating an addenda with the latest stop press developments. As the Editor explains in his foreword, compilation of the book proceeds in alphabetical order of country, starting in January, eight months before publication date. The value of an addenda is manifest.

Other improvements include the updating of the sections covering Indian Ocean navies. The new construction programme of the Indian Navy (submarines, escorts and fast attack craft) is included, although this could have received the emphasis that is its due by setting out separately the planned A69 type escorts, including in the class heading the planned additional SSGW fast attack craft, and the additional PETYA type escorts.

The sections for Pakistan and Indonesia have also been updated, as has that for Iran. These improvements make the book an ideal reference work for students of Australian defence.

Extension of the practice of including drawings in individual ship class sections is welcome. Drawings are much more useful, particularly in the case of incomplete or projected ships, than the conventional artist's impression.

There would seem to be a need for the inclusion of one of two articles of the type that has been included in earlier years. For example, the 1905/06 edition included an article on the naval lessons of the Russo-Japanese War. An article, in this year's edition, on the naval lessons of the October Middle East War would have been both informative and a contribution to the study of naval affairs.

Turning to the nations in the Indian Ocean and Western Pacific Region, the mention of the Indonesian Navy Development Programme is of particular interest.

A navy of 25,000 seamen, and 5000 marines, plus a number of national servicemen, is envisaged in the longer term. Ships will include submarines, fast SSGW armed attack craft, and a number of new anti-submarine frigates. Enquiries for construction of the latter have already been made in Europe. This would seem to offer scope for Australian builders to quote on a competitive basis — a far more satisfactory activity than giving them our own craft when we need them ourselves. Indeed, the Indonesian Section of Jane's does raise doubts as to the advantage of giving them two of our own patrol craft when the Indonesian Navy already has over ninety such craft of their own.

Japan continues to develop and expand her Navy, with four large ocean-going submarines under construction to join the 13 already operational. Five large destroyers, five frigates and four tank landing ships are also under construction.

Afloat support is minimal, but this could be remedied quickly by the same method as that used by the Indians in 1971 — the adaptation of merchantmen.

Details of the Iranian expansion are of particular importance as they highlight the development of another blue water navy for the Indian Ocean. Eight destroyers (including four of the 7800 ton US SPRUANCE Class), four frigates, and a small aircraft carrier, are reported

as planned. The possibility of submarines is mentioned.

China's LUTA Class destroyers of 3250 tons and 400 miles range, armed with Styx missiles, are described in greater detail than last year. Five craft are now in commission, with a further two building. The Chinese are reported as building ocean going submarines at the rate of four per annum, expanding a fleet that already includes 45 large submarines. Two nuclear powered submarines are mentioned.

Turning to the major navy sections, that of the United States is of particular significance to the RAN, as it includes, for the first time, a plan of the patrol frigate type and the sea control ship. The latter is clearly a simple and economic type — 750 men man a ship of 14,300 tons (full load), that steams at 26 knots and carries 3 VTOL aircraft and 16 helicopters.

As the Editor says in his foreword, at approximately the cost of one SPRUANCE Class destroyer, these ships would seem to offer a good return for their cost. The reader is struck by the compatibility of weaponry between the SCS and the PF — this should add to the attractions of acquiring sea control ships to join the PFs already ordered for the RAN, when MELBOURNE eventually goes.

The steady growth of the French Navy, and the sparse firm new construction plans for the British Navy, raise the question as to when the French will overtake the British in naval strength. The French new construction programme is described in detail — a nuclear powered aircraft carrier, a nuclear powered submarine with cruise missiles, continued construction of diesel electric submarines, and plans for over twenty new escorts are included.

The new French minehunting system, now operational in the 460 ton CIRCE, with remote control, is of interest to Australia in studying the replacement of our ageing wooden-hulled craft.

The Russian section cannot be read without growing concern. Indeed, year after year, Jane's shows the growth of the navies of major Totalitarian States, whilst those of the Democracies become ever weaker and smaller. The reader of

historical bent cannot but be reminded of the situation in the early thirties, when the Totalitarian States were steadily expanding their armed forces and the Democracies realised their danger almost too late.

The Editor has put his first year's experience to good use in producing an improved and updated book, particularly so far as our own neighbourhood is concerned. The price in Australia was not available at the time of going to press, but the Australian reader would find the book good value for money at the thirty devalued dollars the writer paid for his copy when he obtained it direct from England.

### NELSON

By Roy Hattersley

Published by Weidenfeld & Nicolson, London. 223 pages including index, bibliography, 16 pages of colour plates and 100 black and white illustrations. PRICE \$6.95

Reviewed by "IKARA". Review copy supplied by Hicks Smith & Sons Pty Ltd, Sydney.

Part of a series entitled "The Great Commanders" under the General Editorship of Lord Chalfont (others are "Rommel", "Napoleon" and

"Robert E. Lee"). Roy Hattersley's book is one of absorbing interest for the historian, be he naval historian or otherwise. This is a fine study of the man who set himself the task of becoming a national hero, and succeeded.

Whilst the story of Nelson's naval triumphs is familiar to most readers, the revelations about Nelson the man made most interesting reading. The man who set out to become England's best known Naval Officer is shown as impetuous and vain, a man with a giant ego who would tolerate no rivals, real or imagined, and who feasted on the adulation that was heaped upon him. Frequently in trouble with his superiors by his outspoken criticisms of them and his disobedience of orders when he considered he need not obey, Nelson paid for his folly by spending five years "on the beach" after hostilities between England and France ended in 1787.

Hattersley is unsparing in his description of Nelson's notorious affair with Lady Hamilton. It must have been obvious to most of their acquaintances that the relationship existed, and their efforts to conceal it (particularly in respect of the

child, Horatia) were so feeble as to be laughable. Such was Nelson's fame however, that Lady Nelson's refusal to tolerate the relationship brought her under fire from contemporary writers.

Hattersley also gives detailed accounts of Nelson's naval triumphs, in particular the Battle of the Nile, Copenhagen, and of course Trafalgar. And it is here that we see why this vain, egotistic, tactless and naive man achieved the fame that he did. He knew his job. He was a professional Naval Officer when many of his contemporaries, particularly on the other side, were still amateurs. He was a superb tactician with a fine professional knowledge. He believed in having well-trained, well-fed, well-informed and happy crews. In short, he was a good man-manager.

Apart from being well-written, this book is very well-presented. Printed on good quality paper, it is lavishly illustrated with contemporary paintings and cartoons. "Nelson" is attractive as a good coffee-table book, but it should not be regarded as only that. The text makes it well worth reading, and the book would be, in my opinion, the best in its field.

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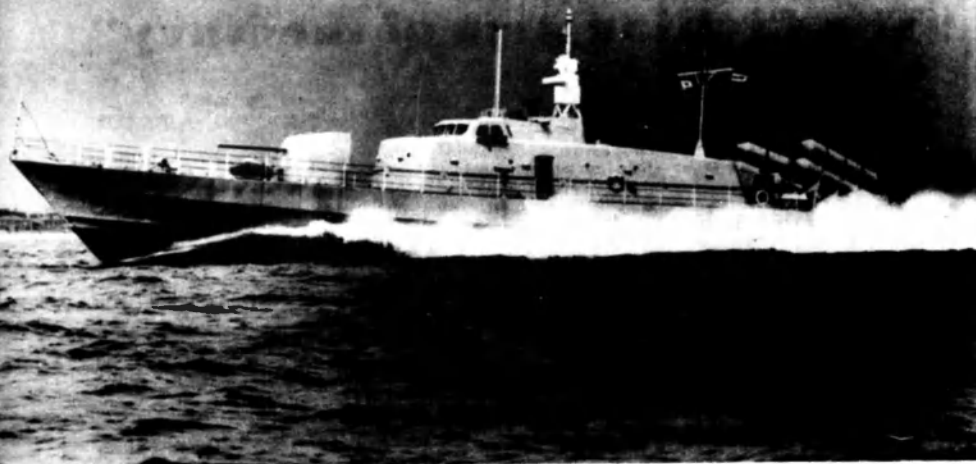
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# PATROL BOATS

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



*Vesper Thornycroft private venture fast patrol boat TENACITY. This 142 foot, 40 knot, gas turbine-diesel fast patrol boat before purchase by the Royal Navy, was fitted with Contraves Sea Killer surface-to-surface missiles and Sea Hunter fire control equipment.*

**Active amongst commentators advocating the increased role of the patrol craft have been the marketing personnel of companies seeking sales for their products — patrol craft.**

These commentators have found willing allies amongst politically-orientated commentators who see patrol craft as a way of getting defence on the cheap.

Whilst this writer does not doubt the sincerity of such commentators, the potential of patrol craft does have to be considered objectively.

Undoubtedly, patrol craft have an important and vital role to play in Australia's defence. The Navy already recognises this, in that it runs three squadrons of such craft

— one each from Cairns, Darwin and Sydney.

Patrol craft can perform a number of roles but, to Australia, there is a most important exception. They cannot cope with submarines. It is submarines that pose the major existing maritime threat to Australia. It is modern submarines that

are now in the hands of our northern and Indian Ocean neighbours. It is their submarine threats that our neighbours are expanding.

The Navy is considering the possibility of ordering new patrol craft because:—

- The Government is giving away seven of the Navy's patrol craft (to Indonesia and New Guinea). There is a need to replace these craft.

- The remaining patrol craft will all be worn out by the end of the decade.

- There is a need to counter increasing trespassing in Australian fishing waters.

## THE ROLE OF PATROL CRAFT IN OUR MARITIME ENVIRONMENT

At this time, there are four 'Warm War' naval threats to Australia:—

- Submarine attack upon our coastal or international trade

- An attack by mines upon our trade.

- A small scale attack by light or irregular craft upon our off-shore resources.

- Guerilla, or commando-type incursions against coastal installations.

Patrol craft, of an appropriate type, could be capable of dealing with the third and fourth threats only. No patrol craft is capable of dealing with modern submarines. Patrol craft are too small to carry weapons systems effective against modern submarines, and too noisy and insufficiently stable to carry the necessary detection systems.

Nor are patrol craft capable of keeping up with and escorting merchant vessels over long distances in a sea way. Whilst some

patrol craft overseas have been fitted for minesweeping duties, practical experience has shown that such vessels have the disadvantage of the 'Jack of All Trades' — they are master of none. Therefore, it must be accepted that patrol craft are far from a solution to all naval threats potential or existing.

## OUR ATTACK CLASS PATROL CRAFT

After the Government have indulged their generosity, the Navy will have thirteen patrol craft left. These are all ATTACK Class boats, of 146 tons full load, and an armament of one 40mm gun. Their diesel engines give them a speed of 24 knots.

It is generally acknowledged that the ATTACK Class has not been a wholly successful design. Whilst their range and armament are acceptable in a time of total peace, they are of minimal combat value in Warm or Hot War circumstances. Practical experience has shown that their sea keeping qualities are insufficient for Australian waters. There are doubts as to the suitability of their propulsion systems.

All these factors, coupled with the

practical experience gained from operating the ATTACK Class, and the observation of combat experience gained by other navies in the use of patrol craft, will be taken into account in designing the next generation of patrol craft for the Navy.

## PATROL CRAFT — DESIGN FACTORS

The term patrol craft is used to describe a very wide range of craft — from very fast, short ranged attack craft, armed with surface to surface guided weapons (SSGW), to slower "prevention" craft, able to remain on station for less short periods, but armed perhaps with only one gun. The former are not really patrol craft at all — they are very heavily armed, fast, lightly constructed, short ranged strike craft for use against large surface targets. The very broad nature of the patrol craft classification has been recognised by the Editor of Jane's Fighting Ships in the latest (1974/75) edition. He has regrouped patrol craft into two classes — Fast Attack Craft and Patrol Craft.

The design of our new patrol craft must recognise:—



*A Susa class fast attack craft-missile of the Libyan Navy. These fast patrol boats are fitted with the Nord-Aviation SS 12(M) missile which is fitted with a 66lb (30kg) warhead.*



• To an extent at least, range, speed, payload (in the form of armament and reserve ammunition) and sea-keeping qualities are variable, the one at the expense of the other. In other words, the faster the boat, the shorter the range and/or the smaller the armament or the lower the reserves of ammunition. All four qualities cannot be improved without increasing the size of the craft.

• Sea-keeping qualities are of vital importance in the Australian environment. These are difficult to assess, because the best measure is practical experience in the theatre in which the craft are intended to operate. The difficulties experienced by the ATTACK Class in Australian sea conditions emphasises the attention the RAN needs to pay to sea-keeping qualities.

• Most, if not all, the smaller overseas designs of patrol craft are suitable for operating in restricted waters over short distances.

• The interchangeable weapons fit concept is being used successfully overseas, not least in the Israeli Navy. One outfit of guns (for peace time patrolling), and another of SSGW (for Warm War circumstances) could offer the Navy attractions.

The RAN's peacetime need is for craft effective in prevention or patrol, as distinct from the attack role. On the other hand, the craft should be suitable for an attack role in warm or hot war circumstances. Above all, the design selected must be capable of remaining on station for extended periods.

There is no place in the RAN for craft with a radius of action of five hundred miles, and an armament that can only be reloaded by returning to base.

The construction of larger patrol craft, using the extra space to improve range and seakeeping qualities, may well provide the solution to the problem of selection of type of craft to be constructed.

#### COMBAT EXPERIENCE WITH MODERN PATROL CRAFT

In recent years, there have been a number of occasions upon which patrol craft have been used in full combat circumstances. It is the first such occasion that still attracts the most attention. Although, at the time, the destruction of the Israeli destroyer EILATH was a most



*Twenty ATTACK class patrol boats were built in Australia at a cost of \$300,000 per unit and delivered from 1967. Five were constructed for the New Guinea coastal security force and the remaining fifteen for the RAN — two of the Australian boats, BANDOLIER and ARCHER, have since been given to Indonesia.*

significant event, more recent events are of much greater significance.

The first known occasion of SSGW being fired from a light craft, against major surface targets occurred in 1967, when a Soviet-built fast craft, flying the Egyptian flag, sank the 23-year-old Israeli destroyer EILATH in the Mediterranean. The Egyptian vessel was operating in the harbour defence role at the time, whilst the Israeli destroyer was operating in warm war circumstances with her commanding officer under limitation as to the extent of action he could take against patrol craft. This is an instance of an elderly vessel, without any defence against SSGW, being destroyed in circumstances ideal for the patrol craft.

In the Bangladesh war, in 1971, the Indians used their Soviet OSA class SSGW armed fast patrol craft in an attack on two 25-year-old Pakistani destroyers (which were at sea in full war circumstances) and a number

torpedoes. No Israeli craft was even damaged.

The design of the Israeli craft is of some interest, particularly when compared with their antagonists, the Soviet-built craft used by the Egyptians and Syrians. The Soviet craft carry only two or four launchers, with no reloads, and fire a relatively large (half ton) warhead. The largest Arab craft displace only 165 tons. They carry minimal armament apart from their SSGW. Once they had fired their SSGW, the Soviet-built craft were at the mercy of the heavy gun and multi-missile armament of the heavier Israeli craft.

The earlier Israeli craft were built in France, and were markedly heavier (220 tons) than their opponents. They utilised the alternative weapon fit concept, some being armed with rapid fire 76mm guns with modern fire control, and others with the Israeli developed Gabriel missile. This is a markedly smaller weapon (150lb warhead), but is carried in much larger numbers. The Israelis have developed further the French design, and constructed in Haifa larger improved SAAR craft. The new type displaces 415 tons, and carries seven

SSGW launchers and two rapid fire 76mm guns. In going larger, the Israelis have sacrificed speed, (32 knots compared with over 40 knots) for a heavier armament and improved range. The Israeli decision to construct more of the improved SAAR type craft is of particular interest, because the decision was taken in the light of their experience in the October, 1973, war.

In the recent Cyprus conflict, the Greeks' modern SSGW-armed craft appear to have taken no part, although the Greeks committed a number of major naval units. As there was an obvious opportunity to use the Greek modern fast craft against the elderly Turkish destroyers, it is reasonable to conclude that Cyprus is outside the effective operating range of the French-built Greek flag-fast attack craft. Using published figures regarding the range of the Greek craft, this is a reasonable conclusion.

Combat experience with fast patrol craft shows that where these craft are armed with SSGW and are attacking unarmed merchant-men or obsolete warships. The SSGW armed fast attack craft are very effective. However, when attacking

targets that have either their own SSGW or air cover, the SSGW armed fast attack craft are by no means invincible.

Modern rapid fire guns, with the type of control systems fitted in many newer destroyers, have made the surface launched torpedo an unattractive offensive weapon. As soon as the torpedo-armed craft gets within launching range, it will be subject to much more accurate and more rapid gun-fire than was ever experienced in World War II.

#### THE DECISION

As with the selection of escorts, the Navy will have to balance the advantages of a more expensive, purpose built patrol-attack craft, ideal for local operating conditions, against a proven overseas design. Many overseas designs are manifestly unsuitable for local conditions. Exceptions to this include the Israeli improved SAAR type, which could serve as a base design, perhaps with some payload sacrificed for increased range. Certainly, in seaworthiness, range, and weapons fit, the Israeli design has much to offer — not least, they are combat proven.

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*HMS HECATE, one of two Royal Navy survey ships which have begun surveys to explore Britain's important undersea energy reserves.*

*HMS HECATE and her sister ship HMS HECLA are carrying out a comprehensive geophysical survey of virtually the whole of the UK continental shelf. The survey is being carried out by Royal Navy surveyors and members of the Institute of Geological Sciences who are helping with the interpretation of seismic records from special instruments supplied by the Institute.*

*Among equipment which will be used is a side-scanning sonar which produces a traced picture of the sea-bed for several hundred yards on either side of the ship and shallow seismic reflection equipment which produces medium frequency shock waves that penetrate the sea-bed and are reflected in echoes on a trace. When scientifically interpreted, this shows the geological structure of the sea-bed layers to a depth of several hundred feet.*

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With this Order-in-Council dated 12 August, 1795, the Hydrographic Department of the Royal Navy was born. The person appointed to carry out its instructions was Alexander Dalrymple. Hydrographer to the East India Company, who by this appointment became the first Hydrographer of the Navy.

Up till that time, a captain in the Royal Navy had to provide his own charts for a voyage, such charts being produced privately from original surveys of greatly varying reliability. Curiously enough, many of these surveys were commissioned by the British Admiralty, although it made little use of them.

Dalrymple diligently and methodically applied himself to his task, gradually building up his staff to include a copperplate engraver and a printer. However, he was such a perfectionist that although he successfully selected, compiled and catalogued the large amount of navigational information even then available, he produced no charts and so was dismissed in 1808. He died, broken hearted, within a few weeks.

**Practical Officer**

Dalrymple's successor was

Captain Thomas Hurd, a practical officer, whose name is commemorated by the Hurd Deep in the English Channel, north of the Channel Islands. Hurd vigorously set about the job of supplying the fleet with charts. He also formed the nucleus of a hydrographics surveying service, by searching out officers with the mathematical knowledge and appropriate temperamental qualities and persuading the Admiralty to grant them special extra pay. Another important innovation of Hurd's was to place Admiralty charts on sale for merchant vessels. Hitherto, these had been regarded as "classified" documents because of the important military information they contained. While this was true up to a point, it was clearly important that merchant ships should be able to import raw materials and export manufactured goods with minimum risk of stranding or shipwreck.

The end of the Napoleonic Wars, marked the beginning of a low point in the history of the Hydrographic Department. Massive cuts in military expenditure were aggravated by the personal antagonism

towards hydrography of John Crocker, Secretary to the Board of Admiralty since 1809. At the time, too, the Hydrographer's office was not a separate department and, indeed, Captain Parry, who succeeded Hurd in 1823, felt himself to be "a director of a chart depot for the Admiralty, rather than a guide and originator of maritime surveys."

Nonetheless, during Parry's tenure of office — much of which was spent on Arctic expeditions — many fine surveying voyages took place. There were the expeditions of Parry himself, and of John Franklin, in search of the North West Passage, gravity observations in the North and South Atlantic, surveys in Latin America and, most important of all, Captain Owen's great survey of the coast of Africa from the Gulf of Aden, southwards by the Cape of Good Hope to Sierra Leone.

**High Summer Begins**

So, with Parry often away in the Arctic, and Crocker in office, the activities of the department expanded only slowly. But Crocker departed eventually, of course, and with the appointment of Francis

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Beaufort as Hydrographer in 1829, the high summer of hydrography began. Beaufort held the post for 26 years, during which time Royal Naval surveyors charted the coastline and coastal waters of a large part of the globe, untrammelled by diplomatic considerations of territorial waters.

Probably the biggest technical development during Beaufort's era was the introduction of steam propulsion, which enabled surveying vessels to work in the most suitable direction, regardless of wind or weather. That apart, the techniques used for depth-sounding and position-fixing dated back to the previous century, a fact which makes the accuracy of the surveys carried out in the mid-19th century all the more remarkable.

After Beaufort, the worldwide work of the Royal Naval Surveying Service continued unabated under various Hydrographers up to the beginning of the 20th century. Work was carried out in the Black Sea and the Mediterranean, in the Far East and South Pacific. Under Rear Admirals Washington and Richards, soundings preparatory to the laying of the first transatlantic telegraph cable were carried out. During Richard's time also, and with his support the historic scientific cruise of Her Majesty's Ship *Challenger* commenced. This three-and-a-half-year circumnavigation gathered an enormous quantity of scientific data on the world's oceans, their inhabitants and sea beds and can truly be said to have laid the foundations of modern oceanography. Admiral Wharton, taking over in 1884 as the last hydrographer of the century, showed a new scientific approach to all forms of surveying observations in his manual "Hydrographic Surveying", which was a standard work even into the 1930s.

### Growing Pressures

With the coming of the 20th century, increased national sensibilities limited the Hydrographer's freedom to carry out worldwide surveys. But the requirements for hydrographic work had always been greater than the department's ability to meet it, and within the confines of the then British Empire there was still plenty of work to do. Even when World War II brought a halt to most normal surveying activities, pressures of hostilities required a considerably increased



*HMAS BEAGLE*, one of the Royal Navy's hydrographic survey ships, which inspect the sea-bed through electronic eyes, seen on patrol in the Irish Sea. The ships are fitted with advanced equipment, including electronic distance measuring devices, sophisticated sonar and echo sounders. Admiralty charts are being continually up-dated with the latest information and the sales of navigational charts throughout the world last year totalled some 2 million.

The Royal Navy Hydrographic Department, based at Taunton in Somerset, south-western England, was formed in 1795 to reduce the number of warships lost as a result of inadequate charts. Ocean-going and coastal vessels visit all parts of the world to collect hydrographic, oceanographic and geophysical data — used by supertanker captains and yachtsmen alike. There is worldwide coverage of all navigable waters in the series of charts compiled by the Department since the days of Captain Cook.

The problems of shifting sands, sand waves and channels have always faced the naval surveyor. Massive increases in the size of merchant vessels in recent years, however, means that rocks, shoals and wrecks hitherto of minor significance, are today potential hazards.

output of charts and associated publications. Charts at the time were still printed direct from the copperplate, a process which took about 15 minutes to produce one copy.

During the 1920s, however, the direct printing method was superseded by lithography, speeding up the process tremendously so that output rose steadily. This was fortunate, because during

World War II — in which amphibious operations played a very important part — the requirements for charts of beaches was quite unprecedented. For instance, for D-Day, in June 1944, a million charts were required in the British sector alone and these had to be dispatched to more than 6000 scattered units in some 3000 bales.

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Seasonal Greetings ...

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were being adopted on shore, at sea one of the biggest advances in hydrography surveying was being made in the 1930s. This was the introduction of the echo-sounder. Whereas previously surveyors could only measure the depth at discrete intervals along a line while sailing at slow speed, it now became possible to measure depths continuously along a line as fast as the surveying vessel could proceed.

#### Massive Problem

The end of World War II left a massive new problem to the marine surveyors, in the form of hundreds of wrecks in the shallow seas off northwest Europe which presented a serious hazard to shipping. So in the immediate post-war years a large part of the Hydrographer's survey effort had to be devoted to locating the wrecks and finding the least depth of water over them. And wartime wrecks are still being found which are a potential danger to the very deep-draught shipping in service today.

Gradually the Hydrographer was able to return to his traditional task of charting waters throughout the world which came under British jurisdiction. Work was progressed

around the coast of Britain, in the West Indies and the Indian Ocean, in the Gulf, the Far East and the Pacific, mostly using converted frigates and minesweepers for the purpose-built survey ship had yet to come. In the 1950s the third great technical advance in hydrography occurred, with the introduction of electronic position-fixing, a variant of the well known Decca Navigator system, a method now in use by merchant and naval vessels of all nations. An electronic system enables a position to be fixed without reference to marks on shore or to floating beacons, and so makes surveying independent of visibility and sight of land.

New, purpose-built survey vessels came into service in the latter half of the 1960s. Three Hecla Class Ocean survey ships (a fourth is now nearing completion) and four Bulldog Class coastal survey vessels were built on commercial lines, looking (some say) rather like ocean-going luxury yachts with their white hulls and buff funnels, the traditional colours of the survey fleet. To carry out surveys around the coast of Britain the Hydrographer also has five inshore survey craft, completing his present fleet of 13 ships.

#### New Challenges

But advancing technology presents hydrography with challenges as well as better tools. For instance, today's mammoth tankers operate with very small underkeel clearances — some even rely on high tide to clear shallowest parts — and this calls for surveys of a precision and thoroughness neither practicable nor necessary 20 years ago. And there are many other equally demanding problems.

Yet the Royal Navy Hydrographic Department's most important task is still to provide charts and navigational publications necessary for safe voyages. It is one of only four world charting authorities and its products, which are available from specially appointed Admiralty Chart Agents in almost every maritime country, enjoy an incomparable reputation. In 1973, almost £2,000,000 worth of charts and books were sold to the world's mariners, both merchant and naval, making the Hydrographer's the only department of the Navy which actually makes money — although not, on balance, a profit, unless this be the satisfaction of a good job well done.

*Blood donors love life!*

**PLEASE GIVE SOON**

# Nautical Notes from all Compass Points

By "Sonar"

## BRAZIL

### Sperry Gyrocompass Systems

Sperry Gyrocompass have been awarded a contract to supply Mk 19 Gyro Compasses for six frigates under construction for the Brazilian Navy. Four of these frigates are being constructed by Vosper Thornycroft at their Woolston Yard. The two remaining frigates will be built in Brazil under Vosper Thornycroft guidance.

The Mk 19 Gyro Compass is extensively used by the Royal Navy and other Navies and has a reputation for accuracy and reliability.

The compass system as well as giving navigational information also supplies the ship's reference data for gunfire control.

## CANADA

### Exercise Northern Merger

Canadian maritime forces participated in the major NATO exercise Northern Merger on 16-27th September.

The exercise was held in areas of the North and Norwegian Seas, the English Channel and the Iceland/Faroes Gap and involved air, land and sea elements from 10 of the 15 NATO countries.

Canada's participation included the Halifax-based helicopter-destroyers *Iroquois*, *Skeena* and *Margaree* as well as the support ship *Protecteur*. In addition, anti-submarine patrols were flown by east coast based Argus aircraft.

Exercise situations included anti-aircraft, anti-submarine and attack submarine warfare, mine-laying and mine counter-measures, control of merchant shipping as well as land and carrier-based aircraft operation. Marines from the United Kingdom and the Netherlands

practised amphibious landings on the coasts of Scotland and Jutland.

Other nations involved were Belgium, Denmark, France, West Germany, Holland, Norway, Portugal, the UK and the USA.

## FRANCE

### Exocet AM-39 for the French Fleet Air Arm

Following on the Exocet MM-38 anti-ship missile for surface vessels, the French Defence Ministry has selected the AM-39 air-launched version of the Exocet to arm aircraft of the French Fleet Air Arm.

The Exocet AM-39 is a shorter and lighter version of the MM-38, possessing greater range thanks to more advanced solid-propellant motors. This enables aircraft to take advantage of their greater radar horizon to launch the missile from farther away than the mother ship, without the need to penetrate the dangerous envelope created by the enemy ship's air defence system.

The AM-39's greater range, however, in no way prevents it from homing onto the target with the same unerring accuracy as the MM-38.

The British missile-carrying light cruiser HMS Norfolk is at Toulon to take part in the joint Franco-British evaluation trials of the Exocet MM-38 weapon system.

This ship made its first launch with complete success at the Mediterranean test range (CEM) on April 23rd, 1974. The derelict vessel used as a target was hit by the missile.

On April 25th, also as part of the Franco-British evaluation programme, the French experimental vessel "Ile d'Oleron" made another successful firing.

### EXOCET AM-39 and MM-38 CHARACTERISTICS

	Air-to-ship AM-39	Ship-to-ship MM-38
Total weight	735kg	850kg
Length	5.20m	4.80m
Diameter	0.348m	0.348m
Span	1.04m	under 1m
Guidance	1-axis EMD seeker	REFLECTED 1-axis EMD seeker
Propulsion	Solid booster Light-alloy can Burn time : 2 sec Solid sustainer stage Light-alloy can Burn time : 110-120 sec	Solid booster Steel can Burn time : about 2 sec Solid sustainer stage Steel can Burn time : 130 sec
Flight control	TRT radioaltimeter	Modified TRT radioaltimeter
Range	42km	52 to 70km

## GERMANY (WESTERN)

### British Minehunting Sonar Equipment

A contract for the supply of Plessey 193M sonar equipment to the Federal German Navy has been placed with Plessey Marine, Ilford. The contract forms part of a larger deal, due to be formalised shortly and which would be the biggest ever export order to be won by the Marine Division of Plessey.

The 193M sonar is an advanced design, solid state equipment used for the detection, identification and eventual elimination of ground and moored mines which cannot be neutralized by normal sweeping devices. It is a development of the extremely successful Type 193 minehunting sonar currently in service with the navies of four European nations as well as with the Royal Navy with which it is fitted as standard equipment aboard mine-

hunting vessels. In addition to its primary role, the 193M also provides additional facilities including a mine destruction equipment, a pilotage function and a navigational sub-system.

The sonars ordered by Germany are destined for installation aboard the "Lindau" class minesweepers of the Federal Navy's Mine Warfare Force, part of West Germany's contribution to NATO's maritime defence capability. These 370 ton displacement craft are of laminated wooden construction and are powered by Maybach diesels manufactured from non-magnetic materials. Addition of the 193M sonar systems to these specialist vessels, as part of a major re-equipment programme, will provide the West German Navy and NATO with one of the most effective mine counter measure forces in Europe. Close co-operation with the shipyard undertaking the re-equipment programme and with other contractors has been of prime importance and will continue to be so throughout. Particularly close liaison has been established with suppliers of other equipment with which the sonar will interface. This includes a plotting table equipment manufactured by Laurence Scott Electromotors, radar and communications systems supplied by AEG-Telefunken and peripheral equipment of French manufacture. The re-equipment programme provides an excellent example of how co-operation between manufacturers in the EEC countries can operate on a joint basis to serve the defence requirements of any one member. The Plessey contribution also reflects the Marine Division's emphasis upon marketing in the European trade area.

## ITALY

### Ten Year Procurement Programme

Italian Defence Minister Tanassi has recently presented a White Paper, prepared by the Chief of Naval Staff, calling for a 10-year procurement programme (to cost about \$1,061,600,000) involving four 2400 tonne guided missile frigates; two submarines; eight guided missile hydrofoils; a logistics support ship; 40 ship-borne or land-based helicopters; 12 tugs; plus coastal and harbour small craft; and

14 Breguet Atlantic ASW patrol aircraft for the Italian Air Force (but to be operated by the Navy). Despite this re-equipment, it is estimated

### Light missile-frigates

Details have been released concerning the two multi-purpose light missile-frigates (DEG) ordered late last year by the Italian Navy from Cantieri Navali del Tirreno e Riuniti.



The primary design operational capabilities of the vessels are:

1. **surface-to-surface role:** the destruction or nullification of surface vessels of all sizes at long range;
2. **anti-submarine role:** the ability to co-operate in ASW actions with a short-range self-defence capability;
3. **anti-aircraft role:** short-range close self-defence against aircraft and missiles;
4. **amphibious operations:** to carry out shore bombardment against medium-ranged coastal targets.

The principal particulars are as follows:

Displacement, standard/full load	2208/2500 tons
Length, overall	106.00m (347ft 9in)
Beam	11.98m (39ft 4in)
Depth, moulded	7.95m (26ft 1in)
Draught, full load	3.66m (12ft 0in)
Machinery, CODOG	gas-turbines 2 25,000hp
(twin cp propellers)	diesels 2 3,900hp
Generating capacity	4 780kW
Accommodation	200 total

The weapon-fit to be installed is a comprehensive one and comprises:

- an eight single-launcher surface-to-surface missile system by OTO Melara and associated firms.
- a single Compact rapid-fire 127/54 OTO Melara gun with ARGO fire-control system for use in both AA and anti-ship roles
- a point defence missile system based on a multiple launcher
- two close-range anti-missile systems
- two 105mm Breda ELSAG multi-purpose 20-barrel rocket launchers
- two triple torpedo tubes

Search equipment to be fitted: an SMA (Segnalamento Marittimo ed Aereo) surface search radar, a

that retirement of older ships and equipment will in the meantime reduce the total tonnage of the Italian fleet by more than half.

Selenia air search unit, a medium-frequency sonar, an IFF installation, an automatic plotter for command and control. The communications outfit, to satisfy the requirements of a naval and shore command network, will include UHF, VHF, MF and HF transceivers, transmitters and receivers together with a teletype system and crypto facilities. There will also be an ECM installation.

A twin cp propeller CODOG propulsion plant has been selected to fulfil requirements of high flexibility, rapid response, reliability and simplicity. The installation is to consist of two General Electric-FIAT LM2500 aero-derived gas-turbines each developing 25,000hp and two FIAT 20-cylinder V-form A230 diesel engines each developing 3,900hp at 1140rpm. The plant is installed in three adjacent compartments, the g-t room, gearbox room and diesel room, and as the reduction gears themselves are watertight, propulsion will be available even with two adjoining compartments flooded. The machinery control is located in the diesel engine room.

Electrical requirements are met by two separate generating plants each consisting of two 780kW alternators driven by 6-cylinder versions of the diesel propulsion units. One generator per plant is adequate to meet all electrical demands. The plants are sited in two compartments, one forward of the g-t room and the other in the diesel room so that three adjacent compartments can be flooded with power still available.

NBC protection is provided by a pre-wetting plant, absolute air filters, and the air-conditioning plant.



## SWEDEN

### Marconi degaussing equipment for Swedish submarines

Sweden's three latest submarines are to be fitted with very advanced automatic degaussing equipment and static power inverters supplied by Marconi Radar Systems Limited. The three submarines, of the type A-14, 'Nacken' class, will each be so fitted to help to make them 'invisible' to magnetic mines or other magnetic sensors, and also to provide all the 60Hz and 400Hz power supplies on board.

The order, for both static inverters and degaussing equipment, was won with the co-operation and assistance of the Company's Swedish associates, Svenska Radio AB.

The inverters and degaussing equipment take advantage of the latest developments in both component and circuit techniques and will be designed and manufactured to the highest standards to comply fully with stringent naval requirements for operation in widely varying conditions of temperature and shock. The equipment is designed for installation in small submarines where space is at a premium. The system will operate at very low noise levels and will be screened against radio frequency interference.

## UNITED KINGDOM

### Ferranti FM1600B Computer for Mine Counter-Measures Vessel

A contract worth approximately £750,000 has been placed by the Ministry of Defence with the Ferranti Digital Systems Division to provide the first production FM1600B computer action-information system for the projected new class of Royal Navy mine counter-measure vessels (MCMV). Development of the necessary operational computer programs (software) forms a major part of the work. This contract follows successful completion of a study project to assess specific characteristics required of a computer information and control system for MCMVs.

The development of this special version of a computer-assisted action-information system (CAAIS)

was entrusted to Ferranti as a result of the considerable practical experience acquired by the Digital Systems Division in designing, installing and maintaining CAAIS systems for larger warships such as Amazon Type 21 frigates for the Royal Navy, as well as HMS Hermes, and also the Mk10 frigates now being built for the Brazilian Navy.

The new class of MCMVs have reinforced plastic hulls and one of the engineering tasks undertaken by Ferranti has been to reduce the magnetic signature of the computer equipment. At the heart of the system will be an FM1600B computer driving two Deccascan displays equipped with Ferranti manual input assemblies which enable operators to communicate with the computer by means of alpha-numeric keyboards and tracker balls.

The CAAIS system for MCMVs fulfils a triple role: it compiles and displays information with the speed and precision required for successful MCM operations; it makes the detailed calculations necessary for the accurate navigation and control of the ship; and, as in all CAAIS systems, it provides a comprehensive display of the tactical situation, such as would be required when the ship is on patrol duties.

The ability of the CAAIS system to automatically accept and process sensor information presents the Command with the ability to reduce

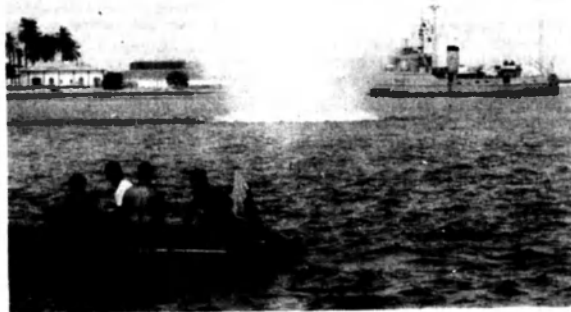
errors and action-time, operator fatigue, and generally to increase the MCMV's ability to meet its designated task.

## CLEARING SUEZ

A cloud of spray heralds the destruction of an unexploded bomb in the Suez Canal by men of the Royal Navy's fleet clearance team. Already the three Royal Navy minehunters, including HMS BOSSINGTON (background), have cleared Port Said of mines and explosives and the harbour is slowly returning to life once more.

The joint British, American and Egyptian operation involves clearing the entire 90-mile canal of the dangerous debris resulting from the recent conflict. This comprises crashed aircraft, sunken ships, rockets, unexploded bombs and mines.

The Royal Navy's task is to pinpoint each hazard, using the minehunters' sophisticated underwater detection equipment, followed up by divers of the 18-man clearance team who lay the explosives. Britain's participation in the operation came as a result of a request from the Egyptian Government for help in clearing the canal. Though the Royal Navy force will remain under home control, full liaison will be maintained throughout with the Egyptian authorities.



THE NAVY

Nov/Dec/Jan, 1974-5

## PORT OF LONDON CLIPPER REGATTA, 1975

The Port of London Authority has undertaken the task of co-ordinating the programme for the regatta on the Thames in London being organised for the last week in August 1975, to coincide with the start of the Financial Times Clipper Race.

The Regatta, to be known as the 'Port of London Clipper Regatta, 1975', will feature events afloat and ashore, creating the principal holiday attraction in the London area at that time.

The Regatta's most spectacular sight will be provided by the rally of sail training vessels, including a number of the square-rigged 'Tall Ships' which will be moored in the upper and lower pools, by Tower Bridge, many of the smaller schooners and other vessels being in St Katherine Yacht Haven where Taylor Woodrow and the World Trade Centre are providing moorings for them. This 'London Festival of Sail' is being organised by the Association of Sea Training Organisations.

Also at the World Trade Centre's St Katherine Yacht Haven will be the contestants in the Financial Times Clipper Race, from August 23rd to 30th, making final preparations for their non-stop race to Sydney and non-stop back again, the most arduous test for modern ocean racing yachts yet devised. The race is called the 'Clipper' race because they will not only be sailing over the routes of the old wool clipper ships but also trying to beat the record runs of the fastest of the clipper ships of a hundred years ago.

Greenwich will also be a centre of attraction during the Regatta. There the contrast between the 'Cutty Sark', the last of the Wool Clipper Ships, and Sir Francis Chichester's 'Gipsy Moth IV', clearly demonstrates the difference between the great ships of a hundred years ago and the size of the modern yachts which will contend in the Financial Times Clipper Race, for which both the 'Cutty Sark' Society and Lady Chichester are presenting prizes. There the Council is planning a whole series of public events illustrating the part Greenwich has played in the history of England and of world-wide navigation.

At Greenwich also, in the Painted Hall of the Royal Naval College, by

kind permission of the Admiral-President of the College, on 29th August, will be held the FT Clipper Race Ball, in aid of the Association of Sea Training Organisations and the Outward Bound Trust.

The following morning, on Saturday, 30th August, the contestants in the Clipper Race will come out of St Katherine Yacht Haven and will head down river, leading a procession of the sail training vessels and all the other craft coming to London for the Regatta, creating a spectacle which promises to draw people from all over the world.

## UNITED STATES OF AMERICA

### McDonnell Douglas, Northrop Team on US Navy Air Combat Fighter

McDonnell Douglas Corporation and Northrop Corporation have announced that the two aerospace firms have entered into an agreement under which they will jointly develop and propose an Air Combat Fighter (ACF) for the US Navy, which is based on the Northrop YF-17 design now under evaluation by the US Air Force in the ACF competition.

Under the teaming agreement, McDonnell Douglas will have prime contract responsibility for a carrier-suitable version of the Northrop YF-17 to meet the requirement of the proposed US Navy Air Combat Fighter (VFAX). Northrop will have prime contract and design responsibility for the USAF Air Combat Fighter and YF-17 variants for use by NATO nations and other allies.

The agreement between McDonnell Douglas and Northrop supports the US Government's desire to make maximum use of components and technology of the USAF Lightweight Fighter prototype

programme on both the USAF and USN Air Combat Fighters. Such common effort would achieve large savings in procurement, operation and logistics support, while increasing deployment flexibility. The agreement also recognises that it is in the national interest to develop industry teams to maintain a broad industrial base in the United States.

## THE SUPER FLAGSTAFF OF GRUMMAN AEROSPACE CORPORATION

Grumman Aerospace Corporation has announced its design for the SUPER FLAGSTAFF, an 83.5-ton hydrofoil vessel which will provide unprecedented capability for open ocean habitability, ruggedness and operational economy. The new hydrofoil will have the ability to carry up to 65,000 pounds of payload over 1700 nautical miles.

The SUPER FLAGSTAFF concept is based on the 67-ton FLAGSTAFF PGM-1, designed and built by Grumman for the United States Navy.

Grumman Aerospace Corporation, a subsidiary of Grumman Corporation, is a pioneer designer and builder of large hydrofoil craft. During the last twenty years Grumman has designed the 64-ton passenger ferry DOLPHIN, the 320-ton experimental antisubmarine warfare vessel PLAINVIEW (AGEN-1), largest hydrofoil built to date; the 90-ton Maritime Administration test hydrofoil H. S. DENNISON; and more recently, the 67-ton FLAGSTAFF, which performed coastal patrol and high-speed reconnaissance-surveillance missions in Viet Nam. The DENNISON and FLAGSTAFF were built in Grumman's own facilities.

Grumman is offering the SUPER FLAGSTAFF for military applications throughout the Free World.



An artist's impression of the Super Flagstaff, an 83.5-ton hydrofoil vessel having high endurance and sea-keeping ability. Equipped with a variety of armament, it can satisfy the more demanding needs of long-duration patrol missions.

THE NAVY

Page Twenty-nine

# DEFENCE REPORT, 1974



*Survey ship, HMAS FLINDERS is based at Cairns, Queensland, with her primary responsibility in the Barrier Reef area.*

**Presented to Parliament by The Honourable Lance Barnard, MP, Minister for Defence**

*Extracts relating to the activities of the Royal Australian Navy*

**Increased emphasis has been placed on joint training and exercising during the past year, and the tempo of joint exercising can be expected to increase as the Services practise and refine procedures and appropriate tactics for operating together in the defence of Australia and its interests.**

The Royal Australian Navy organises, trains and equips naval forces for timely and sustained operations at sea for the defence of Australia and the protection and advancement of Australian interests. For these purposes the RAN maintains and exercises a modern, well equipped and highly trained maritime force. The structure of this force is based primarily on the provision, at sea, of a balanced naval task group, comprising the aircraft carrier HMAS MELBOURNE, sup-

porting destroyers and destroyer escorts, and logistic units. Additionally, the RAN's submarine force provides a significant contribution to the capabilities of the Fleet.

The RAN's hydrographic and oceanographic ships have been fully engaged on their survey programs.

The whole question of Service assistance in coastal surveillance has been under close consideration in co-operation with the civil authorities.

The RAN's patrol boats have been

actively employed on patrol and surveillance duties in northern Australian waters directed towards the protection of Australian territorial waters and the contiguous fishing and resource zones.

A fourth patrol boat has recently been assigned to Darwin, making a total force of seven on permanent station in the Northern area.

## **Force Activities Overseas**

In support of the Five Power

arrangements, the RAN continued to deploy one destroyer or destroyer-escort continuously and one RAN submarine twice yearly in the Malaysia-Singapore area. A number of RAN ships also visited the region for exercises.

HMAS ANZAC visited New Zealand on the occasion of the Commonwealth Games. The ship served not only to represent the people of Australia through her presence in New Zealand, but also to provide communication facilities for the Prime Minister during his visit there.

In February, HMAS MELBOURNE visited the United States and transported 12 Boeing Chinook helicopters and five Iroquois utility helicopters to Australia on behalf of the RAAF. At the same time MELBOURNE transported 14 armoured vehicles (six armoured command post vehicles and eight cargo carriers). Combined with the role of transportation of defence equipment, MELBOURNE carries 130 men of the Townsville-based 2/4th Battalion to Hawaii for exercises with the US Army's 25th Infantry Division.

In support of the Defence Co-operation Program with Indonesia, the landing craft, HMAS LABUAN, transported survey equipment to North Sumatra for the Royal Australian Survey Corps deployed there.

Other activities included port visits to the Pacific Islands, Philippines, Thailand and to Indonesian ports.

In support of the Australian and New Zealand joint policy of protest against the continuing of the French nuclear tests in the Pacific, HMAS SUPPLY deployed to the South Pacific area from 25 June to 7 August 1973 to provide fuel for HMNZ ships OTAGO and CANTERBURY.

## **Exercises and Training**

Exercise KANGAROO ONE was the principal combined exercise of the year. It involved 38 ships, 121 aircraft and 15,000 men from Australia, New Zealand, Britain and the United States, operating in the Tasman and Coral Seas and Queensland in June this year.

The exercise was designed to incorporate the maximum number of tactical situations at sea, on land and in the air that the time scale allowed. These included an opposed



*L 129 — HMAS TARAKAN was the base for navy divers when conducting a population census of the Crown of Thorns Starfish on the Great Barrier Reef.*

transit of a maritime force, an amphibious landing in the Shoalwater Bay area and a land battle, all of which involved offensive and defensive air operations.

In the maritime phase, which opened the exercise, a naval task force was sent into the Coral Sea to locate and strike an American amphibious group which was entering the area from an unknown direction.

The task force included the RAN flagship HMAS MELBOURNE with escorts, an RN task group and a RNZN frigate.

The Army's 3rd Task Force from Townsville was involved in the land warfare phase and was assisted in the later stages of the "battle" by a United States Marine amphibious unit which carried out an amphibious landing in Shoalwater Bay.

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Attached to the Task Force for the  
exercise were two companies of  
New Zealand and US Army troops.

Long-range Orion and Neptune  
maritime reconnaissance aircraft  
were employed by the RAAF in  
search and anti-submarine roles  
and F111C strike aircraft from  
Amberley were used in both their  
primary role and as maritime strike  
aircraft. Air operations also in-  
volved RAN, Army, RNZAF, RN and  
United States Marine Corps aircraft,  
including helicopters, long-range  
maritime patrol aircraft, transport,  
anti-submarine and ground-attack  
fighter types.

### Navy

During the past year, the RAN partici-  
pated in the following exercises:

• LONGEX 73. An anti-submarine  
convoy-protection exercise  
between Auckland and Sydney from  
21 September to 5 October. HMA  
ships STALWART, PERTH, VAMPIRE  
and ONSLOW participated in the  
exercises as well as ships from  
Britain, the United States, New  
Zealand and the Netherlands.

• RIMPAC 73. A multi-threat naval  
exercise in the Hawaii area. HMA  
ships MELBOURNE, BRISBANE and  
STUART departed Sydney on 24  
August to take part in the exercise  
with naval and military forces of the  
United States, Canada and New  
Zealand.

• EXERCISE LEADLINE. An  
exercise designed to test the capa-  
bilities of the Five Power Defence  
arrangements and set in the China  
Sea approaches to Singapore area.  
Units from Malaysia, Singapore,  
Britain and Australia participated in  
the exercise. Australia's contribu-  
tion being HMA ships MEL-  
BOURNE, BRISBANE, PARRA-  
MATTA and STUART. MEL-  
BOURNE's Skyhawk fighter-  
bombers took part in certain phases  
of the exercise which involved the  
integrated air defence system for  
the area.

• EXERCISE SOUTHERN CROSS.  
RI (Republic of Indonesia) ships  
SORONG, JOS SUDARSO and LUM-  
BUNG MANGKURAT visited Sydney  
in January and exercised with HMA  
ships STALWART, VAMPIRE, SWAN  
and OXLEY. The joint exercise  
included surface tactical  
manoeuvres, surface and air target  
firings, anti-submarine exercises  
(including maritime aircraft) and  
seamanship exercises.

## THE DEFENCE PROGRAM The Five Year Defence Program

In developing the Five Year  
Defence Program for the period  
1974-75 to 1978-79 the Department  
of Defence, in consultation with the  
Services and the Department of  
Manufacturing Industry, con-  
ducted its annual cyclic review of the  
contribution to Defence capability,  
and preparedness, of existing and  
proposed elements of the force  
structure. These included not only  
the weapons, equipment, and force  
levels of the Services, but also the  
infrastructure for their support  
such as bases, housing, head-  
quarters support and the Defence  
Industrial base. This review took  
account of military, technological,  
economic, industrial and scientific  
factors and provided the back-  
ground to decisions taken by the  
Government in the context of the  
1974-75 Budget.

The determination of the relative  
priorities to be given to the com-  
peting demands on resources avail-  
able for Defence activities was  
derived from the strategic outlook.

Account was taken of such factors  
as:

• The need to accord a higher  
priority to longer term potential  
rather than short term results.

• The need to plan for an increase  
in the proportion of resources allo-  
cated to capital equipment and to  
improvements to the infrastructure.

• The increasing costs of man-  
power, both Service and civilian.

• The time at which equipments  
currently in service reach end of life  
over the next decade and whether  
these contribute to capabilities  
which Australia needs to retain.

• What new capabilities should be  
acquired.

• The cost and benefits of local  
production and local maintenance  
of defence equipments and the  
importance of retaining defence-  
related skills and knowledge in the  
Australian industry at large.

• The need to ensure that by com-  
mitting defence expenditure to  
various equipments now, financial  
and other resources required for the  
acquisition, at some future time, of

*Ten Sea King anti-submarine helicopters (pictured) are to replace the  
20 Wessex helicopters in the RAN at a cost of \$43 million.*





*Dakota aircraft in service with the RAN have been replaced with two Hawker Siddeley 748 Turbo-prop aircraft.*

items of higher priority are not pre-empted.

- The long lead time to acquisition of items of capital equipment.
- The long lead times to acquire and develop certain military skills.
- The urgent need to have base, training and housing facilities available to the Services.

Emphasis is continually being given to improvements in equipments and facilities and in the conditions of service within the Services. Our defence capability is reflected by the forces in being, the skills and experience inherent in these forces and the potential capability these forces provide for expansion should the need arise. Australia's forces in being are complemented by the high level of technical and professional skills possessed by Australian industry and by the Australian people generally. These also are relevant to consideration of potential force expansion.

#### Defence Force Development

As already noted, present circum-

stances provide opportunities to shift the emphasis in planning defence capabilities towards longer term needs. The Government has taken advantage of these opportunities to provide, by prudent management, for efficient and economic allocation of defence resources.

Australian forces are well equipped and the equipment is manned by highly motivated, skilled and professional personnel. Taken in the broad historical context, we are providing a much higher level of defence capability than ever before achieved for a period when we are not involved in a specific conflict. Compared with the forces of other countries in our region, the Australian defence force, through its modern, well maintained equipment and the high levels of technological expertise and professional military skill of its personnel, is in a position to expand and absorb additional sophisticated equipment should the need arise.

A broad and balanced range of defence capabilities is being maintained and developed.

#### Navy combat forces

**Destroyer Forces** are being maintained at a high level of effectiveness. Three of the four older River Class escorts, which provide the backbone of the Navy's anti-submarine warfare capability, are to be extensively modernised and the fourth escort modernised to a lesser extent. The three modern guided missile destroyers are undergoing an update program which will provide them with modern fire-control and command systems.

In order to maintain the effective operational destroyer strength of the RAN during the early 1980s, the Government approved, in April 1974, the purchase of two United States patrol frigates, subject to the achievement of satisfactory financial and contractual terms, performance capability and industrial offset programs.

**Submarine Forces.** The delivery of two new Oberon-class submarines in 1975 and 1976 will raise the strength of the RAN's submarine force to six of this type which is one of the most modern conventional submarine designs.

**Fleet Aviation.** Operation of the aircraft carrier HMAS MELBOURNE enables skills to be retained in fixed and rotary wing naval air operations, which contribute to our capabilities in fleet air defence, air strike, reconnaissance and anti-submarine warfare. These capabilities will be enhanced by the delivery of the Sea King ASW/cargo helicopters now on order. Investigations are currently being undertaken to determine the economical life of HMAS MELBOURNE in maintaining the Navy's fleet aviation capability.

#### Equipments for the Services

During 1973-74 significant progress was made on major equipment projects for the Services. New equipment purchases were approved by the Government during 1973-74. These included — destroyers for the RAN, medium tanks and fire support vehicles for the Army, long-range maritime patrol aircraft for the RAAF and the further preproduction development of the Barra sonobuoys.

#### Major equipments delivered in 1973-74

##### NAVY

- 1 Hawker Siddeley HS748 twin engine support and training aircraft.
- 3 heavy landing craft
- 4 Naval combat data systems
- 1 survey motor boat
- 5 harbour personnel carriers
- 7 concrete ammunition lighters
- 13 sea and utility boats
- 1 motor whale boat

#### Progress on major equipment projects

##### NAVY

**OBERON CLASS SUBMARINES.** Construction of two additional submarines is proceeding. Due largely to industrial unrest and shortage of manpower in the UK, some delays have occurred and completion is now expected in late 1975 and mid-1976, respectively.

**Slave dock and associated wharfage.** Construction of the slave dock to provide the capability for concurrent refitting of two submarines has been delayed slightly by a shortage of some key materials. Completion is now expected in the

latter part of 1974. To enable the optimum utilisation of the slave dock, planning is now under way for the reconstruction of Fitzroy Wharf at Cockatoo Island. The wharf is expected to be completed by 1978.

**Refit of Oberon submarines.** Since the commencement of this program in 1971, major refits have been completed on HMAS OXLEY and OTWAY. HMAS OVENS is currently undergoing refit and it is planned that the refit of HMAS ONSLOW will commence in early 1975.

**Action Information organisation tactical trainer and submarine command team trainer.** The building to house these trainers at HMAS WATSON, South Head, NSW, has been completed and trainer installation is proceeding satisfactorily. The facilities are expected to be operational by September 1974.

**Turana — pilotless target aircraft.** Production and trials of the drones by Department of Manufacturing Industry are continuing. The first Navy production order is planned to be completed by early 1975.

**Anti-submarine warfare-cargo helicopters (Westland Sea King).** Delivery of the majority of these aircraft to Australia is expected in the first half of 1975. A tender has been accepted for a flight simulator, part of which is to be manufactured in Australia. The simulator is scheduled to be operational by March 1976.

**Naval combat data systems.** The installation of the first of these systems in the Combat Data Systems Centre in Canberra has been completed. Planning for the remaining systems to be fitted to the RAN guided missile destroyers is well under way and installation will commence in late 1974 in HMAS PERTH in the USA. Installation in HMAS HOBART and BRISBANE is planned to be carried out in Australia.

**New destroyer project.** The Government decided in April 1974 to acquire two United States Patrol Frigates. Following recent ministerial negotiations with United States authorities it has been decided that final commitment to purchase two ships need only be made when satisfactory investment costs, acceptable performance capability, satisfactory industrial offset programs and agreed financial and contractual terms have been achieved.

**Oceanographic ship.** In accordance with the Government approval to construct the oceanographic ship at Williamstown Dockyard, planning is now well under way and the ship is expected to be completed by late 1978.

**Modernisation of the River Class destroyers.** Planning is in progress for the modernisation of these four ships to be carried out in Australian shipyards.

#### Defence Facilities Capital Works

Expenditure planned for 1974-75 is \$54.9m of which \$43.5m is for works in progress at 30 June 1974. These included major works at the Royal Australian Corps of Transport Centre at Puckapunyal (Vic), the Jungle Warfare Training Centre, Canungra (Qld), Williamstown (Vic) Naval Dockyard, Amberley (Qld) RAAF Base and the West Australian Naval Support Facility.

*The Daring class destroyers, HMA Ships VAMPIRE (II) and VENDETTA (08), were given half-life refits (modernised) during 1971-73.*





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Some of the larger projects planned for commencement in 1974-75 with their estimated costs are:

**Schofields (NSW)** — HMAS NIRIMBA — Construction of an apprentices' academic block and other facilities improvements — \$4400m.

**Nowra (NSW)** — HMAS ALBATROSS — Construction of hard-standing and training buildings for ASW cargo helicopters and other facilities improvements — \$1300m.

**Puckapunyal (Vic)** — General improvements to existing facilities and construction of new living and working accommodation — \$4000m.

### Defence Organisation

A comprehensive report on the re-organisation of the Defence Group of Departments, submitted in November 1973 by the Secretary, Department of Defence, Sir Arthur Tange, CBE, was adopted by the Australian Government.

As a first step in the implementation of the recommendations made in this report the Government, on 30 November, 1973 abolished the separate Departments of Navy, Army and Air and established the integrated Department of Defence. Fundamental changes in the distribution of the powers and responsibilities of the separate Service Ministers and of their principal Service and civilian advisers through the Service Boards and three discrete groups of departmental officers must await Parliamentary discussion and the passage of legislation.

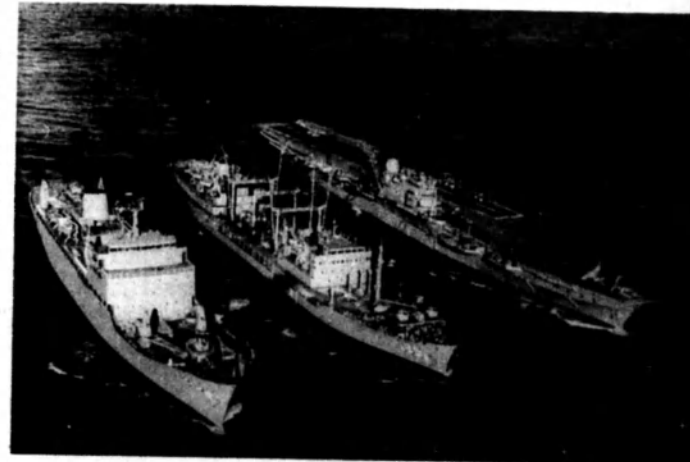
As an interim measure the civilian members of the three Service Boards of Administration (previously the Permanent Heads of the

respective Service Departments) have been replaced by Special Deputies to the Secretary, Department of Defence. The offices of Special Deputy (Navy Office) and Special Deputy (Air Office) are held concurrently on a temporary basis by a First Division Officer, Mr F. J. Green, formerly Secretary, Department of Air. The office of Special Deputy (Army Office) is held by Mr J. B. R. Livermore who, until the Service Departments were abolished had been acting Secretary of the Department of the Army. It is proposed that appropriate legal status will be given to the Govern-

ment's Chief Military Adviser, who, as Chief of Defence Force Staff, will command the Defence Force assisted by the Chief of Naval Staff, the Chief of the General Staff and the Chief of Air Staff who will command their individual arms of the Force.

The Strategic Policy and Force Development Organisation on which the Government depends for strategic advice and for analysis of the options of defence capability is in the process of being established. The various elements, such as Strategic and International Policy, Force Development and Analysis, Defence Industry and Materiel

*The RAN's three largest ships — destroyer tender STALWART, fleet oiler SUPPLY and aircraft carrier MELBOURNE, at sea off Jervis Bay during a work-up for Exercise Kangaroo 1 conducted in the Coral Sea.*



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Policy, are in operation and only the addition of the Service Chiefs of Materiel is required to complete the organisation. These officers will be appointed when the Service Boards are abolished.

Progressive implementation of the central manpower organisation is proceeding and, in consultation with the Services, is developing policy for manpower requirements of the three Services. Except for some areas relating to very senior ranks the Services retain control over most promotions, postings and individual training of personnel, also a large number of other personnel matters which are special to each Service such as discipline, etc. The development of employment policy in respect of civilians as well as servicemen is now centred in the Department of Defence, as is the organisation dealing with the overall use of manpower resources which make up the total military and civilian employment.

Central control and co-ordination has been established in the Organisation and Management Services area, and much has been done to achieve co-ordination and standardisation of practice in the operating elements such as registries, libraries and statistical services. It is planned to have the Defence Regional Offices, which are to support Service commands and units together with the civil establishments in their vicinity, in operation early in 1975. Progress is also being made in setting up the Australian Defence Communications System which was the subject of a study by a special committee which from 1971 to 1973 considered the rationalisation of Defence communications.

Final implementation of the Defence Science and Technology Organisation is dependent on the passage of legislation necessary for the transfer of certain defence research and development functions which have been carried out by the Department of Manufacturing Industry. Significant partial implementation, however, is proceeding and under an interim Ministerial agreement Defence now has operational control of these elements in the Department of Manufacturing Industry. Additionally, elements from the three Services are being drawn together

## SERVICE ORDER OF BATTLE Ships of the RAN

1 Aircraft Carrier:	HMAS MELBOURNE	Pennant No R21	Flagship
3 Guided Missile Destroyers:	HMAS PERTH	DDG 38	First Australian Destroyer Squadron
	HMAS HOBART	DDG 39	
	HMAS BRISBANE	DDG 41	
2 Daring-class Destroyers:	HMAS VAMPIRE	DD11	Second Australian Destroyer Squadron
	HMAS VENDETTA	DD08	Third Australian Destroyer Squadron
6 River-class Destroyer Escorts:	HMAS YARRA	DE 45	
	HMAS PARRAMATTA	DE 46	
	HMAS STUART	DE 48	
	HMAS DERWENT	DE 49	
	HMAS SWAN	DE 50	
	HMAS TORRENS	DE 53	
4 Oberon-class Submarines:	HMAS OXLEY	SS 57	First Australian Submarine Squadron
	HMAS OTWAY	SS 59	
	HMAS OVENS	SS 70	
	HMAS ONSLOW	SS 60	
2 Coastal Minesweepers:	HMAS IBIS	MSC 1183	First Australian Mine Countermeasures Squadron
	HMAS TEAL	MSC 1152	
	(operational reserve)		
2 Minehunters:	HMAS SNIPE	MSH 1102	
	HMAS CURLEW	MSH 1121	
	HMAS BRUNEI	L 127	First Australian Landing Craft Squadron
	HMAS LABUAN	L 128	
	HMAS TARAKAN	L 129	
7 Landing Craft Heavy*	HMAS WEWAK	L 130	
	HMAS SALAMAU	L 131	To PNG late 1974
	HMAS BUNA	L 132	To PNG late 1974
	HMAS BETANO	L 133	
20 Patrol Boats:	HMAS BOMBARD	PTF 99	First Australian Patrol Boat Squadron
	HMAS BUCCANEER	PTF 100	Second Australian Patrol Boat Squadron (Cairns)
	HMAS BARRICADE	PTF 98	
	HMAS BARBETTE	PTF 97	
	HMAS BAYONET	PTF 101	Third Australian Patrol Boat Squadron (Darwin)
	HMAS ATTACK	PTF 90	
	HMAS ASSAIL	PTF 89	
	HMAS ADVANCE	PTF 83	
	HMAS ARROW	PTF 88	
	HMAS AWARE	PTF 91	SAR duties Jervis Bay
	HMAS ARDENT	PTF 87	HMAS Cerberus
	HMAS ADROIT	PTF 82	RANR Training
	HMAS ACUTE	PTF 81	
	HMAS BANDOLIER	PTF 95	
	HMAS ARCHER	PTF 86	Transferred to Indonesia Nov 73
			To be transferred to Indonesia 74
	HMAS AITAPE	PTF 84	Papua New Guinea
	HMAS MADANG	PTF 94	Patrol Boat Squadron
	HMAS SAMARAI	PTF 85	
	HMAS LAE	PTF 93	
	HMAS LADAVA	PTF 92	
Training Ships:	HMAS ANZAC	DD 59	(Decommission August 1974)
	HMAS DUCHESS	DD 154	
2 Reserve Training Ships:	HMAS BANKS	DG 244	
	HMAS BASS	GS 247	
Support Ships:	HMAS STALWART	AO 215	1 Destroyer Tender
	HMAS SUPPLY	AO 195	1 Fleet Oiler
	HMAS MORESBY	AGS 73	2 Hydrographic Survey Ships
Survey and Research Ships:	HMAS FLINDERS	AGS 312	
	HMAS DIAMANTINA	AGOR 266	2 Oceanographic Research Ships
	HMAS KIMBLA	AGOR 314	

\* An eighth LCH, HMAS BALIKPAPAN, is to be transferred to the RAN in September.

to form the Military Studies and Operational Analysis Division.

Following extensive discussion with the Public Service Board the central organisation to control resources and financial programs has been agreed to. There are now three major elements of this organisation:

- Resources Policy and Planning.
- Programmes and Budgets.
- Financial Services and Internal Audit.

This organisation will be responsive and accessible to those Service officers with command responsibilities to ensure that their views are reflected at all appropriate levels and at the formative stages of the development of the Five Year Defence Program and the annual Defence Estimates.

In the area of Supply and Support significant progress has had to await final decisions on the redistribution of the functions of the former Department of Supply, and on the decisions to be made on the recommendations on the Report of the Committee of Inquiry into Government Procurement (headed by Sir Walter Scott).

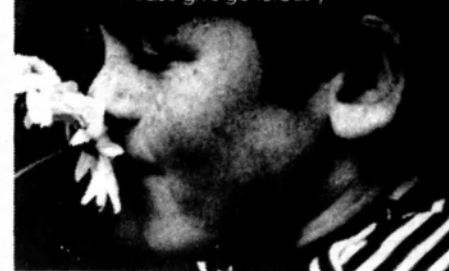
## Fleet Air Arm

### Squadrons

VF 805:	Front-line strike and fighter squadron	A4G Skyhawks
VS 816:	Front-line fixed-wing anti-submarine squadron	S2E Trackers
HS 817:	Front-line helicopter anti-submarine squadron	Wessex 31B helicopters
HT 723:	Helicopter aircrew training and pilot continuation training	Iroquois and Bell 206B-1 helicopters
VC 724:	Fixed-wing strike fighter pilot training and Fleet requirement flying and trials	Macchi jet trainers, TA4G Skyhawk trainers and A4G Skyhawks
HT 725:	Anti-submarine helicopter operational training and Fleet requirement duties	Wessex 31B helicopters
VC 851:	Training squadron for pilots, observers and aircrewmembers	S2E Trackers, and HS 748s
	Twin-engine conversion, communication and Fleet requirement flying	

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