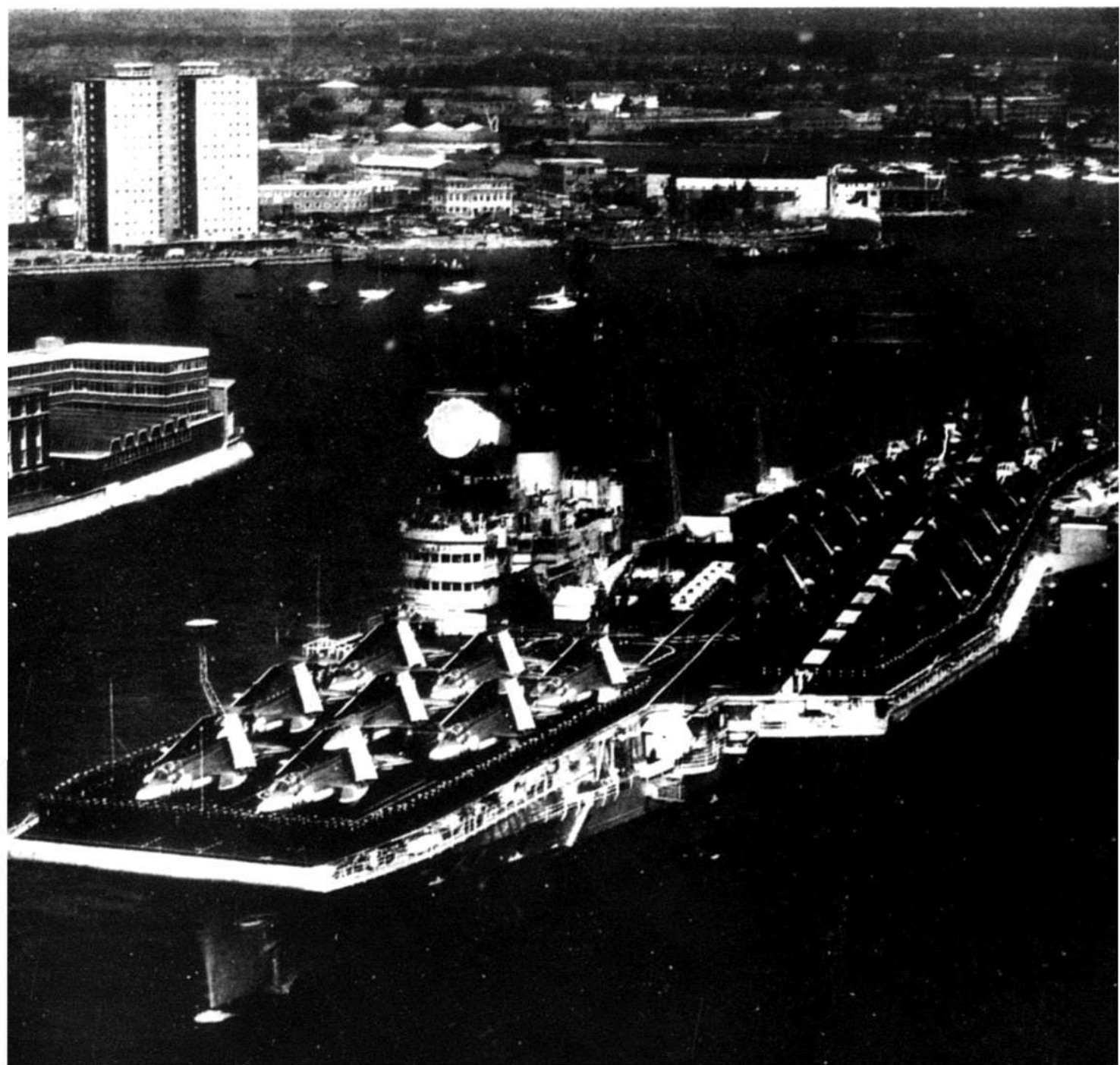


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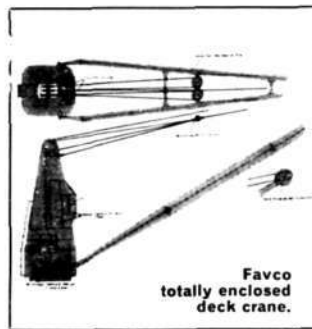
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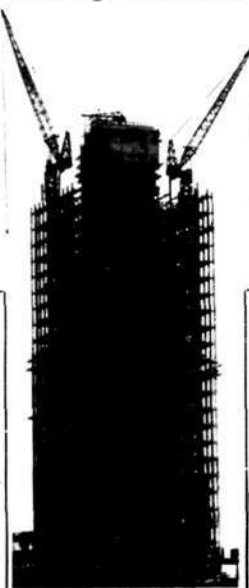
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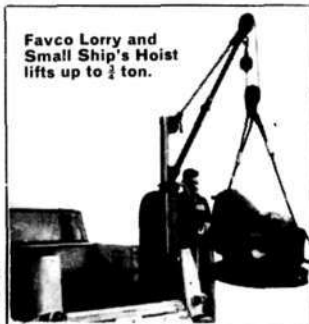
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The magazine of the Navy League of Australia

Vol. 28

NOVEMBER-DECEMBER-JANUARY, 1966-1967

No. 4

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THE NAVY

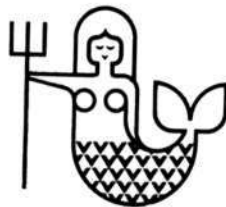
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DEFENCE REPRESENTATIVE SINGAPORE

Commander I. M. Burnside, R.A.N., Executive Officer at H.M.A.S. "Watson" has been appointed Australian Defence Representative in Singapore from December, 1966, and will be granted the rank of Acting Captain for the posting.

The Defence Liaison Officer at Singapore, as well as being responsible for liaison with British Headquarters, Far East Command, and with the Singapore Ministry of Defence and Armed Forces, is also Services' Adviser to the Australian High Commissioner in Singapore.

TEST BAN MONITORING STATION

The United Kingdom is to set up and operate a detection station in Western Australia which is intended to monitor the partial nuclear test ban treaty.

A small advance party of British civilian scientists arrived in October and preparatory work commenced on a site at the R.A.A.F. base, Pearce, Western Australia.

All resultant data from the new equipment, although of a classified nature, will be made available to Australia.

The station will be operated by the Australian Department of Air and the United Kingdom Atomic Energy Authority.

All costs of operating the specialised equipment at the Station will be borne by the United Kingdom.

PACIFIC CONCORD 2— AIR EXERCISE

A combined air exercise involving units of the R.N.Z.A.F., R.A.A.F. and U.S.A.F., will be held in New

Zealand from 7th to 23rd February, 1967.

The exercise, to be called Pacific Concord 2, is the second of a series of annual exercises involving the three air forces.

The aims of Pacific Concord 2 are to develop closer working relationships between participating forces, improve the capability to conduct combined air operations, increase mutual understanding of methods of employing tactical air and to test mobility and responsiveness for mutual support by exercising air lines of communication to and from the South Pacific.

The exercise will be conducted from R.N.Z.A.F. bases at Ohakea and Auckland with some units operating from Taupo and Waiouru.

Pacific Concord 2, will be divided into three phases. The first, an air defence/air superiority exercise will be followed by a tactical phase run in conjunction with a New Zealand army brigade field exercise in the Waiouru area, concluding with a fire power demonstration on the Air Force bombing range at Kaipara.



The "IKARA" missile

\$17 MILLION TRAINING PROGRAMME

The Government has approved the purchase of training equipment costing \$17 million, to train Royal Australian Navy personnel in the operation and maintenance of new detection and weapons systems, including the Ikara anti-submarine missile (see photograph).

Navigation and anti-submarine warfare training equipment will be installed at H.M.A.S. "Watson". New equipment will be installed at H.M.A.S. "Cerberus", where weapons, marine engineering, radio and radar specialists are trained. The Apprentice Training Establishment, H.M.A.S. "Nirimba" will also be provided with new training systems.

NAVAL BARRACKS

A Naval barracks building with views of Sydney Harbour was officially opened by the Minister for the Navy, the Hon. F. C. Chaney, A.F.C., M.P., on 7th October. The barracks are in Wylde Street, Potts Point, behind Garden Island Dockyard and provide modern accommodation and recreational facilities for 400 sailors, dining halls to seat 550, catering capacity for up to 850, administrative offices and also space for the command signal centre, the fleet clothing store and the pay office. The barracks are named H.M.A.S. "Kuttubul", after the Sydney Harbour ferry which was used by the R.A.N. as an accommodation ship when it was torpedoed by a Japanese midget submarine in 1942.

HIGHER NAVAL APPOINTMENT

The Minister for Defence has announced the promotion of Captain (Acting Rear Admiral) W. D. H. Graham, at present Fourth Naval Member and Chief of Supply, to substantive rank of Rear

Wishing The Navy A Happy Xmas and
Prosperous New Year . . .

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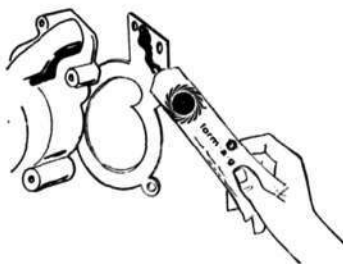


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SYDNEY
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ADELAIDE

Admiral, with effect from 7th January, 1967. Captain (Acting Rear Admiral) W. D. H. Graham entered the Royal Australian Naval College in 1934; his subsequent appointments have included:

British Admiralty for duty with Director of Administrative Planning, 1956; Joint Services Staff College Course, 1956-1957; Deputy-Director Supply and Secretariat Branch, Navy Office, Canberra, 1958; attended Imperial Defence College, 1962.

IMPERIAL DEFENCE COLLEGE

Captain G. J. Willis, R.A.N. in command of H.M.A.S. "Yarra" has been selected to attend the 1967 course at the Imperial Defence College in the United Kingdom. The principal objective of the College is to train selected members of the Armed Forces and civilian services of the United Kingdom and the Commonwealth in higher defence planning. Australian students have attended the College since 1927.

SEATO AIR PROGRAMME

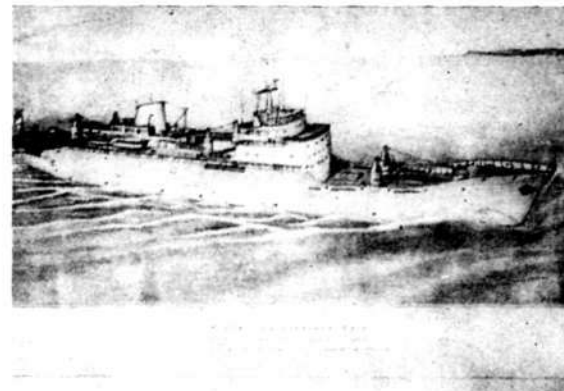
Three officers of the Philippines Coastal and Geodetic Survey are being trained in Australia under a SEATO aid programme. They are a lieutenant and two ensigns, at present undergoing an advanced course in the principles of hydrographic equipment at H.M.A.S. "Cerberus".

They have already completed the first part of their course at Sydney's Hydrographic Officers' School and they are soon to spend study periods with the Army's School of Survey at Bonegilla and with the Australian Bureau of Mineral Resources.

The courses in Australia will be a prelude to a four-month cruise around Australia in the Royal Australian Navy's survey ship, H.M.A.S. "Moresby".

JINDIVIK ORDERS

Another order for Jindivik target drones has been received from the United States. The contract is worth \$A2.5 m. Britain, Sweden and the U.S. have already placed orders for Jindivik worth \$A12 m. The 300th Jindivik 103A was accepted by the head of the British Defence, Research and Supply Staff in Australia on May 11th. The remote-controlled drone has a duration of about one hour at speeds of 500 to 600 m.p.h.



Launched 1966. Designed to maintain destroyers and frigates and advanced weapons systems, including guided missiles. She has a helicopter flight deck and is defensively armed.

"STALWART" LAUNCHED

H.M.A.S. "Stalwart", the largest Naval vessel built in Australia was launched on Friday, 7th October, 1966, by Lady Casey, wife of the Governor-General of Australia.

Almost 2,500 people witnessed the launching at Cockatoo Island, Sydney.

The 14,500 ton vessel has been built as an Escort Maintenance ship for the R.A.N.

When commissioned next year "Stalwart" will have facilities for servicing all vessels of the Australian Fleet when away from home waters and will also act as a base repair ship.

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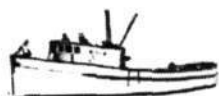
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The Sail training barque "Gorch Fock"

helmshaven, Glücksburg, Glückstadt and Brake. After basic training he goes to one of the Command's special training schools. Special training continues throughout a sailor's career. From young cadet to experienced staff officer, all go back time and time again for advanced training and work.

The Armed Services Act of 19th March, 1956, provided that long service men be given an opportunity to prepare for some civilian occupation. This responsibility also comes under the province of the Naval Training Command. The work of the various technical branches of the new Navy is closely related to a large number of civilian occupations. Apart from such specifically naval matters as shipbuilding, surveying and cartography, the Navy trains coppersmiths, turners, toolmakers, fitters, welders, riveters, cooks and bakers. There are also technical occupations in radar and radio, meteorology, electro mechanics, machinery and aircraft construction and so on, which have their counterparts in civilian life, as well as such general occupations as bookkeeper, photographer, medical attendant, storekeeper and even musician.

Officer cadets are trained in the Officers' Training School at Murwik near Flensburg, which was founded in 1910 under Kaiser Wilhelm II. The school's aim is best summed up in the expression *navale gener-*

months. There are at present more than 35,000 officers and men in the Bundesmarine, and this number is to be increased to 43,000 by 1970, at which time it is intended to have at least 280 ships in commission.

Warship Strength:

One Training Ship.

The Training Ship, "Deutschland", is in fact a light cruiser/destroyer type which can also be employed as a minelayer. Completed on 25th May, 1963, she is the first West German naval ship to exceed the postwar limit of 3,000 tons displacement. "Deutschland" displaces 4,800 tons normal and 5,500 tons full load, is 476 feet in overall length and has a 59 foot beam.

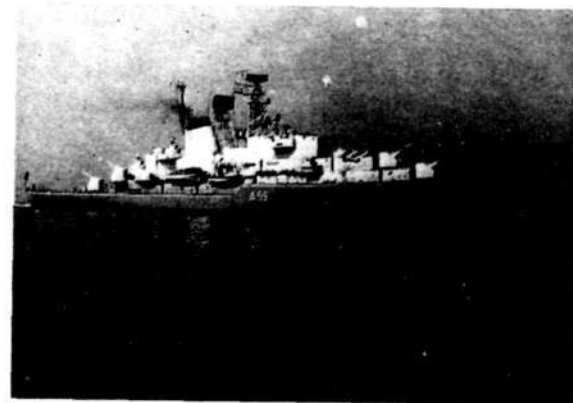
Her armament and machinery is of varying types to facilitate her role as a training vessel.

Main armament comprises four, 3.9 inch guns in single mounts and six, 40 mm. anti-aircraft guns (two twin and two single mountings).

She is fitted with four tubes for anti-submarine warfare torpedoes and two tubes for use against surface ships. Two Bofors, four-barrelled, depth charge mortars (rocket launchers) complete her anti-submarine weapons.

Built to carry one helicopter, the type used is probably a Sycamore or Sikorsky HSS-1.

Powered by two Mercedes Benz and two Maybach diesels, with geared steam turbines turning three



The training ship "Deutschland"

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steam turbines turning three shafts and developing 8,000 shaft horse power, she has a speed of 22 knots.

Ships company comprises 283 officers and men plus 267 cadets—total 550.

Destroyers—total 10.

Four "Hamburg" class—"Bayern", "Hamburg" (see photograph), "Hessen" and "Schleswig-Holstein". The first destroyers built for the Bundesmarine since the Second World War, they were completed 1964-1966, each displaces 4,330 tons full load and are 440 feet in length.

Armament consists of four, 3.9 inch dual-purpose guns; eight, 40 mm. anti-aircraft guns in twin mounts; five, 21 inch torpedo tubes (three bow and two stern) and two tubes for anti-submarine torpedoes. For attacking submarines, these vessels are equipped with two Bofors, four-barrelled depth charge mortars (rocket launchers).

Four boilers and geared steam turbines turning two shafts and developing 68,000 shaft horse power give them a speed of 35 knots.

Ships complement — 288 officers and men.

Six, ex-U.S. "Fletcher" class — named "Zerstörer 1", "Zerstörer 2", etc. These destroyers were rearmed by the U.S.A. and transferred (1958-1960) to Germany, originally for only five years.

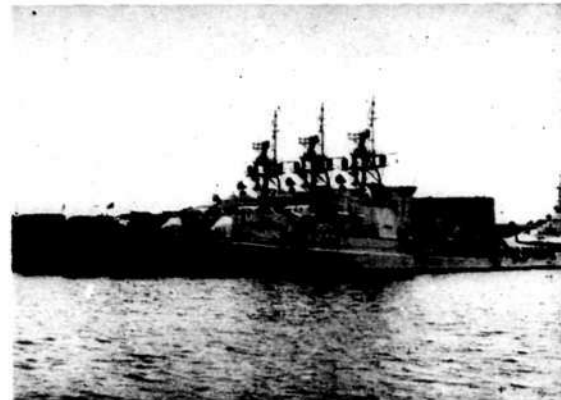
Displacing 2,750 tons full load, a length of 376½ feet and beam of 39½ feet these destroyers are equipped with four, 5 inch, dual-purpose guns in single mounts; six, 3 inch anti-aircraft guns in twin mounts; five, 21 inch torpedo tubes (quintuple bank abaft the after funnel); two hedgehog, anti-submarine weapons and one depth charge rack.

"Z 1" is fitted with racks for homing torpedoes.

A top speed of 35 knots (sea speed, 30 knots) derived from four, Babcock and Wilcox boilers, two sets of General Electric geared turbines turning two shafts and aggregating 60,000 shaft horsepower.

These vessels carry 650 tons of oil fuel.

Complement — 280 officers and men.



Three of the "Koln" class frigates — the "Karlsruhe" is nearest the camera.

Frigates—total 11.

Six "Koln" class (see photograph), completed 1961 to 1963. This class of fast frigates, the first built for the Federal German Navy are named "Augsburg", "Braunschweig", "Emden", "Karlsruhe", "Koln" and "Lubeck".

"Koln", of 2,550 tons full load displacement, was the prototype and name-ship of this novel class of fast anti-submarine frigates or escort vessels first ordered in March, 1957. Of both handsome and racy appearance, their construction is more reminiscent of that of torpedo boat destroyers than of frigates, and their evenly distributed armament gives them a symmetrical layout.

Two, 3.9 inch guns in single mounts (forward and aft) provide the main armament which is supplemented by six, 40 mm. anti-aircraft guns (two twin and two single mountings).

Anti-submarine weapons include, two tubes for anti-submarine torpedoes and two Bofors, four-barrelled depth charge mortars (rocket launchers).

Their propelling machinery consists of a combined diesel engine and gas turbine plant comprising four, 16 cylinder M.A.N. diesels aggregating 12,000 brake horse power coupled to two Brown Boveri gas turbines developing 26,000 horse

power so that the two shafts fitted with variable pitch propellers give them a total shaft horse power equal to a speed of 32 knots.

The remaining five frigates are ex-British destroyers and sloops which have been converted and re-fitted:—

Two, "Albrighton" class ("Hunt" class, type III) — "Brommy" and "Ravle".

One, "Blankney" class ("Hunt" class, type II) — "Gneisenau".

Two, modified "Black Swan" class — "Scharnhorst" and "Scheer".

There are 13 Escort and Support ships of the "Rhein" class, all completed in 1961-1964 — "Donau", "Elbe", "Isar", "Lahn", "Lech", "Main", "Mosel", "Neckar", "Rhein", "Rhur", "Saar", "Werra" and "Weser".

They are rated as tenders for minesweepers, submarines, training and motor torpedo boats, but their handsome design, symmetry and armament indicates that they could more successfully be used as frigates.

Vessels of this class displace 2,540-2,680 tons full load and are 324 feet in length and 38 feet in width.

Armament consists of two, 3.9 inch anti-aircraft guns (not installed in "Lahn" and "Lech") and four, 40 mm. anti-aircraft guns.

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The coastal submarine U3.

Machinery consists of Maybach
or Daimler diesels. Diesel electric
are installed in "Isar", "Lahn",
"Lech", "Mosel" and "Saar". Two
shafts. Brake horsepower: 11,400
equal to 22 knots.

sank in the North Sea during a
heavy gale.

GENERAL

The remainder of the fleet com-
prises: 7 corvettes; 24 coastal mine-
sweepers; 10 patrol boats; 49 motor
torpedo boats; 36 inshore mine-
sweepers; 20 coastal patrol craft;



Inshore minesweepers of the "Schutze" class.

3 minelayers; 2 medium landing
ships (rocket); 4 medium landing
ships and one landing craft; 6 repair
ships; 4 rescue launches; 6 supply
ships; 8 oilers and a number of
depot ships and tenders, sail train-
ing ships (see photograph of "Gorch
Fock"), trials vessels and tugs.

NEW CONSTRUCTION PROGRAMME

Destroyers.

Eight guided missile destroyers of
the U.S. "Charles F. Adams" class
(similar to Australia's "Perth",
"Hobart" and "Brisbane"), three to
be built in the U.S.A. and five in
Western Germany. Those from the
U.S.A. are due for delivery in 1968-
1969.

Complete details of this class of
warship have appeared in previous
editions of "The Navy".

Submarines.

Six, Hunter-killer type, U25-U30,
to be built in German shipyards, the
first scheduled to become opera-
tional in 1967.

Many of the details are still secret
but the following information has
been released:—

Displacement to be 1,000 tons,
the vessels to be capable of firing
homing torpedoes. Machinery will
be diesel and electric motors.

Proposed complement—60.

Submarines—total 11
(conventionally powered).

Eight, Coastal type. U1—U8 (see
photograph of U3).

Four more of this type are under
construction (U9—U12) and will
have hulls of different alloys of
non-magnetic propensity. U4—U8
are sheathed with zinc.

These boats displace 450 tons,
are 144 feet in overall length and
are fitted with eight bow tubes.

They are powered when surfaced
by two diesel engines; brake horse-
power 1,200 giving them a speed
of 11 knots. When submerged, two
electric motors are used providing a
top speed of 17 knots.

The crew comprises 21 officers
and men.

Again, these submarines are the
first built by Germany since World
War II.

Other boats are of World War II
construction and comprise:

One, converted Type XXI (ex-
U-2540), also one Type XXIII,
"Hecht" (ex-U-2367). Last Septem-
ber, her sister "Hai" (ex-U2365)

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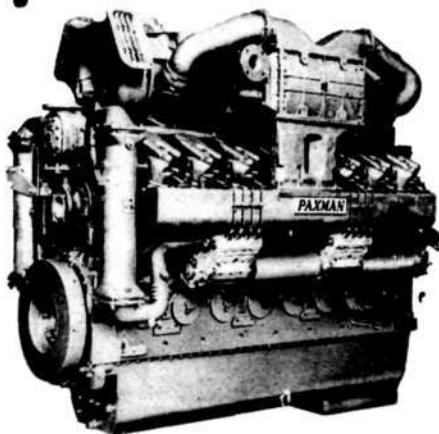
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RH192/4

Twelve, Coastal type, U13-U-24. Are reported to be of similar design to U-4-U9 submarines (refer submarine notes).

Ten corvettes of 2,000 tons (rather large corvettes?) — details not released.

Ten fast patrol boats of 150 tons—details not released.

HYDROFOILS

The German Navy is extremely interested in this new concept of craft and has purchased two Marine Proteus engines to power a prototype Supramar — designed hydrofoil of approximately 160 tons. All other information on this project is restricted at the time of writing.

MISSILES

"Seacat" — short range, ship-to-air missiles. West Germany has placed a \$A3,750,000 order for this British designed and built missile.

Currently, this highly successful, low-cost weapon system is being adapted for operation from fast patrol boats.

NATO countries which have ordered "Seacat" include Holland, and the United Kingdom. It has also been brought by Sweden, Australia, New Zealand, Brazil, Chile and Malaysia.

NAVAL AVIATION

The "Marineflieger der Bundeswehr" is in the process of re-equipment. The first Hawker Sea Hawks (Mks. 100 and 101) were recently phased out of active service and these aircraft have been replaced by Lockheed F-104G Starfighters (see photograph). The decision to use the F-104G's was vigorously opposed by the Navy because they would have preferred to replace the Sea Hawks with aircraft specially designed for operations over sea, such as the British Hawker Siddeley Buccaneer S2. This was refused by the Ministries in Bonn. The next choice was the American McDonnell F-4B Phantom II, but this was also refused for two reasons: firstly its cost and second because it did not fit into the policy of standardisation. The continuing Naval opposition to the F-104G (known as "Widow Makers" by the pilots), was finally silenced by a strict military order given by Bonn, and the

F-104G's now equip the "Marinefliegergeschwader" MFG 1 at Eggebeck and MFG 2 at Schleswig-Jagel.

A Navy spokesman, asked recently how the pilots feel today after they have had some experience in operating the unwelcome F-104G's, stated: "We expected to run into the same trouble the "Luftwaffe" experienced. To our surprise we had no trouble at all. Our pilots are really enthusiastic about the handling characteristics of the F-104G, which has proved a fine and very stable weapon platform irrespective of the altitude they fly. It is more stable than anything else. We have not experienced navigation

problems at all; our pilots do well".

The stability of the F-104G was also highly praised by "Luftwaffe" pilots (the stub wings offering little area to respond to ground turbulence). The experience of Naval pilots is not surprising, for turbulence is usually light over sea. The lack of navigation problems also confirms experience during the last war, when Naval pilots and crews hit their targets with great accuracy because they were better trained in navigation than normal "Luftwaffe" crews.

Introduction of the French Breguet 1150, Atlantic long range anti-submarine and maritime recon-



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naissance bomber (see photograph), as a replacement for the obsolete Gannets has meant a tremendous increase in efficiency. The first two aircraft have already been handed over to the Navy and are stationed at the Nordholz air base. All 20 Atlantics at present on order will be operated by MFG 3.

In addition to Eggebeck, Schleswig-Jagel and Nordholz, the "Marineflieger" has a fourth base at Kiel-Holtenau, and the service's inventory includes a small number of Percival P-69 Pembroke Mk. 54s for communications and transport duties. Fouga CM-170R Magister trainers, Bristol B-171, Sycamore Mk. 14 and Sikorsky S-58 helicopters, and, for search and rescue,

Grumman HU-16 Albatross amphibians, five examples of which have been in "Marineflieger" service since 1958.

Consideration is being given to the acquisition of three more HU-16s, or possibly Dornier Sky servants for the same role.

Replacement of the helicopters with the Bell UH-1D will take place over the next few years, the "Marineflieger" being scheduled to receive a proportion of the 406 helicopters of this type ordered for the German services.

An order valued at more than SA50 million has been placed for the Sikorsky CH-53A anti-submarine helicopter.

It has been decided to form a Trials Unit at Squadron (Staffel) strength of Sikorsky HSS-1s for short-range anti-submarine duties and this will eventually be expanded into a Wing.

In addition, Piaggio P-149Ds are used for liaison as well as Potez-Fouga CM-170R Magisters for various duties. Each "Geschwader" normally has two "Staffeln", or squadrons. Total strength of the "Marineflieger" is in excess of 215 aircraft, including approximately 100 F-104Gs, representing a valuable component of NATO's northern defence line.

CONCLUSION

The Germans have always been good seamen and bold and enterprising warriors. It is a comforting thought that in a possible future war they may be with us and not against us, and that the new German Navy is part of the NATO fleet in Europe.

The Federal German Navy is establishing firm foundations as a European naval power under the aegis of the United States.

The U Boat flotillas continue to grow and in particular the Navy airforce.

The new German Navy, in alliance with the other land, sea and air forces, stands perpetual guard under the international command of NATO.



The Breguet 1150 Atlantic Reconnaissance Bomber.

BOATMAN'S DREAM

A new boon to boat owners — a non-abrasive Marine Liquid Sandpaper — that takes most of the hard work out of refinishing decks, hulls, interiors and brightwork, has been introduced by the General Liquids Corp., of Baltimore, Md. The product cuts sheen, removes scum, embedded dirt, grease and other material harmful to a new finish by the simple process of wiping it on and removing it with steel or bronze wool. It can be applied to any finished

wood, to metal, fibre glass or plywood, inside or out, and develops a porosity that bonds the new finish to the old without crawling or sagging.

16-inch DISPLAY RADAR SYSTEMS

Three companies have announced recently their versions of 16-inch display transistorised sets. Decca Radar, first in the fully transistorised sets with the D202, have now produced the Transar Group 7 sets. They are relative motion

equipments with a display range of 48 nautical miles. They are provided with either 6 ft. or 9 ft. slotted waveguide aerials.

Sperry's Seatrac can be obtained with either a true bearing or relative motion display and claims a similar performance. Great attention is paid, however, to reducing rain and sea clutter by means of circular polarisation and range discrimination by means of logarithmic reception. A discrimination of 25 yards at a mile range is claimed.



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- CORVETTE FOR LIBYA -

The first warship to be designed and built specially for the Royal Libyan Navy is now in commission. Named "Tobruk", the vessel is a 177-ft. corvette and she has been built by Vosper Ltd., of Portsmouth. The ship is a variant of the Vosper 177-ft. corvette designated Mark 1B. She has been designed by Vosper Ltd. in association with Vickers Ltd., and she generally resembles the Ghana Navy's "Kromantse" class, having an identical hull design. The "Tobruk" is intended for three main roles: protection of shipping from air and surface attack, training of junior officers and ratings and state visiting.

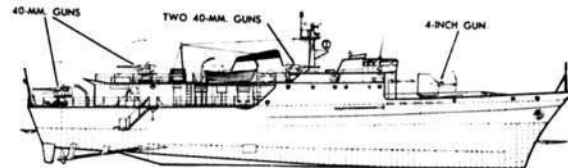
The hull is of mild steel and is generally of welded construction, with light alloy superstructure and partition bulkheads. The longitudinal system of framing has been adopted with deep web frames and fore and aft stringers. Emphasis throughout is on light weight, while preserving ample strength where necessary. The shell plating generally is 0.188 in. thick (7.65 lb.) with heavier plate for the sheer and garboard strakes. There is a box section docking keel and it is filled with plastic foam.

The main armament consists of a 4in. Mark 23 gun, with ammunition hoist, which is carried on an S2 mounting on the foredeck. Four 40 mm. single barrel anti-aircraft guns are carried aft, and on the bridge deck two Mark 5 rocket launchers are fitted, one each side of the signal deck, for target illumination.

The open bridge just forward of the mast is equipped with a chart table, together with internal and external communications facilities. It communicates directly with the bridge deck, which carries three of the 40 mm. guns, the two boats, and the life rafts. The boats carried are a 17 ft. 6in. motor boat and a 23 ft. surf boat. In addition, four 15 man life rafts are carried. An electric winch, provided by Brooklands Aviation Ltd., is fitted on the bridge deck.

Principal particulars of the "Tobruk" are:—

Length over-all 117 ft.



R.L.N. "Tobruk"

Length on waterline	162 ft.	Draught over propellers	13 ft.
Length between perpendiculars	160 ft.	Displacement	440 tons
Breadth, moulded	28½ ft.	Maximum speed	18 knots
Depth, moulded	18 ft.	Fuel capacity	60 tons
		Range (at 14 knots)	3,000 n.m.



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DEFENCE REPORT, 1966

The Royal Australian Navy

Text of the Annual Report presented to Parliament by the Honourable Allen Fairhall, M.P., Minister for Defence.

The Royal Australian Navy is growing at a rate unprecedented in peacetime. Two guided missile destroyers were commissioned during 1965-66 and another 28 vessels — escorts, patrol boats, submarines and an escort maintenance ship — are building in shipyards in Australia, Britain and the United States.

By the end of 1969 the R.A.N. will have in service a well-balanced fleet comprising an aircraft carrier equipped with modern Tracker and Skyhawk fixed wing aircraft and Wessex helicopters, six destroyer escorts, three guided missile destroyers, two destroyers, four Oberon Class submarines, 20 patrol boats and ships for training, logistic support and troop transport.

The growth in fighting power has been matched by a growth in manpower strength. On 30th June, 1966, a total of 14,714 men and women were serving in the Permanent Naval Forces — an increase of 1,211 since last year. The forecast strength at 30th June, 1967, is 16,130. A total of 9,336 civilians is currently employed by the Department of the Navy.

In comparison with 1965-66, estimated expenditure for 1966-67 has increased by \$64.012 million to \$234.634 million, largely due to the purchase of new equipment.

In harbour the Navy's ships are at eight hours notice for steam. At sea they are manned, equipped and stored to fight.

THE R.A.N.'s TASK

The R.A.N.'s responsibilities in time of war are to:

Provide a contribution to Allied naval forces in our areas of strategic interest

Escort Australian military convoys to operational areas.

Protect, in conjunction with the R.A.A.F. within the Australian area, shipping carrying essential imports and exports.

Co-operate with sister services in general operations, including the

defence of the Australian mainland and territories.

Carry out offensive operations against the enemy.

It is with these tasks in mind that the Navy carries out its day to day training and keeps its ships manned, equipped and stored in constant readiness for war or emergency.

The shape of today's Navy, and the pattern of future development is illustrated overleaf. The following pages take a closer look at operational activities, new ships and equipment, personnel aspects, and financial expenditure.

THE FLEET

1 Aircraft Carrier: H.M.A.S. "Melbourne" (Flagship).

2 Charles F. Adams Class destroyers: H.M.A. Ships "Perth" and "Hobart".

3 Daring Class destroyers: H.M.A. Ships "Vendetta", "Vampire" and "Duchess".

4 Type 12 destroyer escorts: H.M.A. Ships "Parramatta", "Stuart", "Yarra" and "Derwent".

1 Battle Class destroyer: H.M.A.S. "Anzac" (Fleet training ship).

1 Type 15 frigate: H.M.A.S. "Queenborough" (Fleet training ship).

6 Ton Class minesweepers: H.M.A. Ships "Hawk", "Gull", "Curley", "Ibis", "Snipe" and "Teal".

2 Submarines: H.M. Submarines "Trump" and "Tabard" (operated by the R.A.N. on loan from R.N.)

In Reserve:

1 Battle Class destroyer: H.M.A.S. "Tobruk".



A Douglas A-4E Skyhawk

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Dried Fruits contain essential vitamins which help to tone up the system and contribute to better health.

THEY CONTAIN IRON

You need iron every day to keep your bloodstream rich and free from injurious impurities. Dried fruits give you iron in a way that makes it easily absorbed into the system.

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The pure grape sugar in Currants, Sultanas and Seeded Raisins does not contribute to tooth decay. Dried fruits are, therefore, ideal for between meal snacks and as a substitute for confectionery.

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2 Type 15 frigates: H.M.A. Ships "Quickmatch" and "Quiberon".

SUPPORT SHIPS

1 Fast transport: H.M.A.S. "Sydney" (also used for training).

1 Fleet replenishment tanker: H.M.A.S. "Supply".

2 Survey vessels: H.M.A. Ships "Moresby" and "Paluma".

1 Survey and oceanographic vessel: H.M.A.S. "Diamantina".

2 General purpose vessels: H.M.A.S. Ships "Bass" and "Banks".

1 Boom vessel: H.M.A.S. "Kimbla" (trials).

In Reserve:

1 Frigate: H.M.A.S. "Culgoa".

1 Survey vessel: H.M.A.S. "Barcoo".

1 Survey and oceanographic vessel: H.M.A.S. "Gascoyne".

Minor vessels: Tugs, boom ships and small support craft.

COMMISSIONING IN 1966-67

1 Oberon Class Submarine: H.M.A.S. "Oxley".

THE FUTURE

1 Charles F. Adams Class destroyer: H.M.A.S. "Brisbane", for completion Sept., 1967.

1 Escort maintenance vessel: H.M.A.S. "Stalwart" due for completion 1967.

3 Oberon Class submarines: H.M.A. Submarines "Otway", "Ovens" and "Onslow" (one due for delivery each year 1967-69).

2 Type 12 destroyer escorts:

H.M.A. Ships "Swan" and "Torrens" due for completion 1969.

20 Patrol boats: Due for completion 1967-68 (5 for use in Papua-New Guinea).

14 S-2E Tracker aircraft: For delivery 1967.

10 A-4G Skyhawk fighter-bomber aircraft: For delivery 1967.

THE FLEET AIR ARM

723 Squadron: Helicopter pilot training and search and rescue duties.

724 Squadron: Various aircraft involved in fixed-wing pilot training, communications and Fleet requirement duties. Special trials.

725 Squadron: Wessex anti-submarine helicopter operational training and Fleet requirement duties.

816 Squadron: "Front Line" Squadron of Gannet anti-submarine aircraft and Sea Venom Fighters.

817 Squadron: "Front Line" Squadron of Wessex anti-submarine helicopters.

GROWING STRENGTH

The construction and delivery of new ships and equipment which will considerably add to the fighting power of the R.A.N. continued during 1965-66 and will increase in 1966-67.

In March, 1966, the first of the American-built Charles F. Adams Class guided missile destroyers, H.M.A.S. "Perth", reached Australia while on 18th December, 1965, the second of the class, H.M.A.S. "Hobart", was commissioned at Boston, U.S.A. The third similar ship, H.M.A.S. "Brisbane" was launched by Mrs. F. C. Chaney, wife of the Minister for the Navy, at Bay City, Michigan, on 5th May and will be completed in 1967.

In Australian shipyards a total of 23 new vessels are under construction. The 14,500-ton escort maintenance ship, H.M.A.S. "Stalwart" launched by Her Excellency, the Lady Casey, wife of the Governor-General, is due for completion at Cockatoo Island Dockyard, Sydney, in 1967. The Type 12 escort H.M.A.S. "Torrens" is under construction at the same shipyard. Another Type 12, to be named H.M.A.S. "Swan", is being built at Williamstown Naval Dockyard, Melbourne. Both escorts, similar to



The first of four "Oberon" class submarines for the R.A.N., H.M.A.S. "Oxley", slips into the water at her launching at Greenock, Scotland



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H.M.A. Ships "Yarra", "Parra-matta", "Derwent" and "Stuart" are due for delivery in 1969.

The Queensland shipbuilders Evans Deakin Ltd., of Brisbane, and Walkers Ltd. of Maryborough, will complete the first of 20 patrol boats early in 1967. The 107-ft. vessels, designed by the R.A.N., will be put into service as soon as they are delivered. It is planned that five will be operated by the R.A.N.'s Papua-New Guinea Division and the remainder will be based at various ports in Australia or be deployed as required.

In Scotland, H.M.A. Submarine "Oxley" is due to complete fitting out at the end of 1966 and arrive in Australia about four months later. Three similar Oberon Class boats, to be named "Otway", "Ovens" and "Onslow" will be delivered at 10 monthly intervals after "Oxley".

The carrier H.M.A.S. "Melbourne" will have a slightly extended refit to enable her to operate the Grumman Tracker anti-submarine aircraft and the Douglas Skyhawk fighter-bombers on order in the United States for delivery late in 1967.

In existing ships, new armaments are improving fire power and fighting strength. More sophisticated anti-submarine torpedoes will soon become available for use by both ships and aircraft of the R.A.N. The Australian-designed anti-submarine torpedo missile Ikara has been successfully fired against a moving submarine and is operational at sea in H.M.A. Ships "Stuart" and "Derwent". Ikara is being fitted to the other escorts H.M.A. Ships "Yarra" and "Parra-matta" during refits and will be installed in H.M.A. Ships "Torrens" and "Swan". Ikara is also being fitted to the guided missile destroyers H.M.A. Ships "Perth", "Hobart" and "Brisbane".

H.M.A.S. "Hobart's" firings in U.S. waters of the Tartar medium-range surface-to-air missile have been very successful. H.M.A.S. "Perth" reported a similar success in her trials with the system last year. Practice firings of the Seacat short-range surface-to-air missile: installed in escorts continue to indicate the suitability of this system

for the close-range anti-aircraft defence of ships.

The surface-to-air practice missile range for Tartar firings in the Jervis Bay area, off the coast of N.S.W., will be operational in January, 1967. During the year H.M.A. Ships "Perth" and "Hobart" will carry out firings at the range. It is intended that navies of other countries will be invited to use the range which will be the only one of its type in the South Pacific.

OPERATIONAL ACTIVITIES

Almost all Australian warships spent varying lengths of time in South-East Asian waters during 1965-66. In May 1966, a total of 12 R.A.N. vessels, manned by 3,584 officers and sailors, were in the South-East Asian area. With the inclusion of personnel serving ashore, the total of R.A.N. personnel in South-East Asia at this time was 3,643. During the year R.A.N. vessels steamed 860,000 nautical miles on operational tasks. A minimum of six ships — two destroyers or destroyer escorts and four minesweepers — served in the British Commonwealth Strategic Reserve throughout the year.

R.A.N. ships visited 132 ports in Australia and abroad. Overseas countries visited were Malaysia, Singapore, Hong Kong, Thailand, the Philippines, South Vietnam,

New Zealand, the Solomon Islands, Fiji Islands, Samoa Islands, New Caledonia, Hawaii, the United States and Canada.

The fast transport carrier H.M.A.S. "Sydney" made three visits to South Vietnam with Australian Army troops and equipment during the year. On each occasion she was escorted by other ships of the Australian Fleet. Each passage was uneventful.

EXERCISES

The main maritime exercise held in Australian waters during the year was Exercise "Warrior" from 8th-26th November. The exercise took place off the east coast and R.A.N., R.A.A.F. R.N., R.A.F. and U.S.N. forces took part. Participating Naval and Air Forces were well exercised in all aspects of anti-submarine warfare.

H.M.A. Ships "Melbourne", "Supply", "Yarra", "Derwent" and "Vampire" took part in the SEATO maritime exercise, "Sea Imp", in the South China Sea in May and June. A total of 39 ships and more than 100 aircraft representing Australia, New Zealand, the Philippines, Britain and the United States took part. The Australian ships co-operated with those of the Allied navies escorting a convoy from Manila to Bangkok opposed by attacking surface and air forces.



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\$800	\$35.67	\$25.40
\$1200	\$38.93	\$30.27
\$1600	\$41.74	\$34.27

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SURVEYING AND RESEARCH

R.A.N. hydrographic and oceanographic vessels steamed about 105,000 miles in widely separated areas during 1965-66.

In the latter half of the year H.M.A.S. "Moresby" began an extensive survey of the north and east coasts of Tasmania with emphasis on Banks Strait. H.M.A.S. "Paluma" continued her survey in the Kavieng area of New Ireland in Papua-New Guinea, while H.M.A.S. "Diamantina" carried out oceanographic cruises in the Indian Ocean. H.M.A.S. "Bass" surveyed in the Torres Strait and Melville Island areas.

The survey to establish safe routes for coastal shipping and ocean-going vessels carrying iron ore from Port Hedland was continued by H.M.A. Ships "Moresby", "Diamantina", "Gascoyne" and "Bass". After this survey "Gascoyne" paid off into reserve in February, 1966.

The R.A.N. has provided further assistance to scientific bodies and State and Federal Government Departments in seismic surveys off the Australian coast. In February, 1966, H.M.A.S. "Kimbla" detonated nine charges of one-ton explosives on the sea bed of Bass Strait to assist in investigations into the earth's crust and upper mantle in the region. Further similar surveys are to be carried out in the

Cape York and Torres Strait area and off the W.A. coast.

PERSONNEL

The manpower strength of the R.A.N. continued to increase during 1965-66. An increase of 1,211 in Permanent Naval Forces personnel during the year brought the total strength to 14,714 on 30th June, 1966. The increase has been due to both active recruiting of new men and to a high re-engagement rate of sailors whose engagements were about to expire. More than half of these sailors, who are fully trained men, signed on for further periods of service. The estimated strength at 30th June, 1967, is 16,130.

Large numbers of R.A.N. officers and sailors continue to train overseas. The entire crew of H.M.A.S. "Hobart", comprising 333 officers and sailors, underwent periods of training in U.S. Navy establishments before taking over their new ship in December. In addition, six officers and 26 sailors who will join the third guided missile destroyer, H.M.A.S. "Brisbane", and the escort maintenance ship H.M.A.S. "Stalwart", are undergoing training in U.S. naval schools.

In Britain, 15 officers and 218 sailors have begun submarine training and are now serving in operational submarines of the Royal Navy.

The R.A.N. has 10 officers and five sailors on loan to the Royal Malaysian Navy, and is training Malaysian Navy personnel in R.A.N. shore establishments.

Training of men who will fly and maintain the new aircraft to be obtained for the Fleet Air Arm in 1967 has begun in both the U.S. and Canada. This will continue during 1966-67, supplementary to the normal Navy pilot training carried out by the R.A.A.F., to provide the numbers required to man the re-equipped R.A.N. squadrons at full strength in 1968.

WOMEN'S ROYAL AUSTRALIAN NAVAL SERVICE

The approved WRANS establishment has recently been increased to 31 officers and 804 WRANS. As accommodation becomes available the additional members will be trained to replace sailors in shore establishments.

NAVAL RESERVE FORCES

Recruiting for the Royal Australian Naval Emergency Reserve began in January, 1965. Numbers have steadily increased to the present strength of more than 700 officers and sailors. During their annual periods of service the members of this force have shown that they have retained their former naval skills and have made a valuable contribution to the running of the R.A.N.

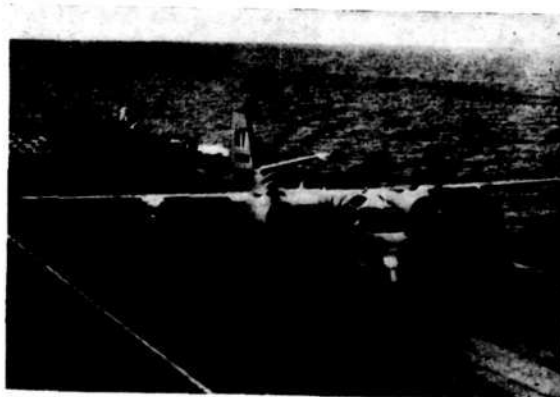
The total strength of the Naval Reserve Forces on 30th June, 1966, was 4,483 officers and sailors, and it is expected that this will increase to 4,930 by 30th June, 1967.

PAPUA-NEW GUINEA DIVISION

Twenty-two Papuans and New Guineans were recruited into the R.A.N.'s Papua-New Guinea Division in 1965-66. They successfully completed their recruit training at H.M.A.S. "Tarangau" at Manus Island, and are receiving their initial specialist training. Recruiting will continue in 1966-67.

CIVIL PERSONNEL

On 30th June a total of 9,336 civilians was employed by the Department of the Navy, an increase of 695 for the year. Of the total, 44 per cent. were employed at the Naval dockyards at Garden Island and Williamstown, and approximately 25 per cent. in



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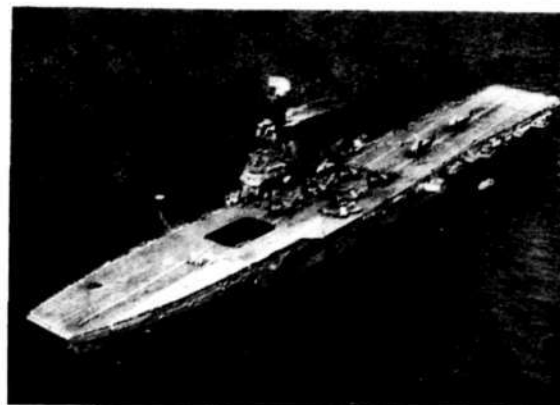
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ally support the Fleet.

BUILDINGS, WORKS AND HOUSING

Expenditure on buildings and
works during 1965-66 was \$6,311m.
an increase of \$2,529m. on the
previous year's expenditure. A
further \$,772m. was advanced to
the States under the Common-
wealth States Housing Agreement
towards the cost of 115 houses and
flats built for Naval personnel.

A new \$2.25m. barracks at Potts
Point, Sydney, for personnel posted
to H.M.A.S. "Kuttatub" or to
ships refitting at Garden Island,
was completed in 1966. Building
of accommodation began at the
Balmoral Naval Depot, H.M.A.S.
"Penguin" and at the training es-
tablishment, H.M.A.S. "Cerberus"
at Westernport, Victoria. Other
projects begun during the year in-
cluded wharfage, workshops and
an administration block for the
submarine support facility at Neu-
tral Bay, Sydney, additional storage
and testing facilities for missiles
at the Kingswood Armament Depot,
Sydney, a weapons workshop at
Williamstown Naval Dockyard,
Melbourne, and facilities at Garden
Island Dockyard, Sydney, for the
support of the new guided-missile
destroyers.

An estimated expenditure of
\$6.8m. during 1966-67 will provide

for such projects as an electronic
data processing and office building
at Garden Island Dockyard
(\$,326m.), technical training centre,
guided missile destroyer support
facilities and other technical facili-
ties at Garden Island Dockyard
(\$,900m.), technical and other
facilities at Williamstown Dock-
yard (\$,94m.), improvements to
water supply and other facilities at
Cockatoo Island Dockyard

(\$,237m.), additional aviation fuel
storage facilities at Sydney
(\$,250m.), facilities for patrol boats
at various locations throughout
Australia (\$,737m.), a new avionics
workshop at the Naval Air Station,
Nowra, H.M.A.S. "Albatross"
(\$,340m.), fuse testing facilities at
Port Wakefield, S.A. (\$,220m.),
WRANS' barracks at Darwin
(\$,388m.), and a new science block
at the R.A.N. College, H.M.A.S.
"Creswell", Jarvis Bay (\$,140m.).

The property acquisition pro-
gramme for 1966-67 includes
\$,567m. for the acquisition of Nel-
son Pier, together with 7 acres of
State-owned land adjoining the
Dockyard at Williamstown, Vic-
toria. Provision has also been
made for \$,900m. to be advanced
to the States under the Common-
wealth-States Housing Agreement.

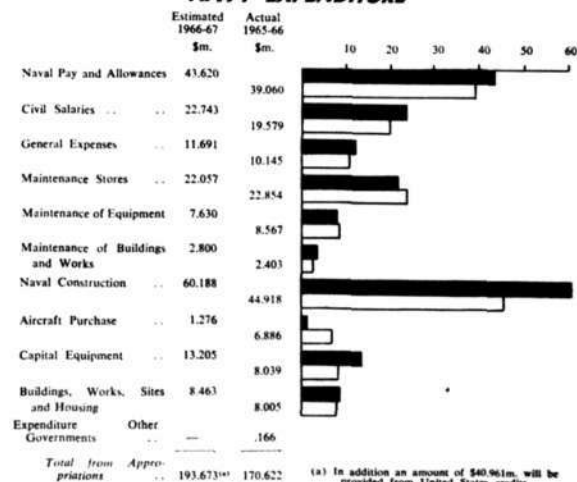
FINANCE

The Navy Estimate for 1966-67
is \$234,634m. This amount com-
prises the appropriation of \$193,-
673m. plus an estimated \$40,961m.
to be spent in the United States on
equipment and stores under the
Logistics Arrangement.

The 1966-67 estimate exceeds
last year's expenditure by \$64,012m.
The increased spending can be at-

(Concludes next page)

NAVY EXPENDITURE



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tributed mainly to the purchase of new ships and aircraft; personnel increases to cope with the expansion; and the procurement of new maintenance stores and capital equipment, particularly in relation to the introduction of complex new equipment and weapons, such as guided missiles.

The chart below shows the major categories of proposed expenditure for the Navy in 1966-67 compared with actual expenditure in the previous financial year.

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BOW-THRUST PROPELLER

Increasing interest is being shown in the fitting of bow-thrust propellers to assist steering at slow speeds in narrow channels and doing without tugs in harbour. The ice-breaking tanker, m.v. "Olau Mark", recently delivered by the Burntisland Shipbuilding Co., has such a propeller in a transverse underwater tunnel in the bow. A four-stroke, pressure-charged, vee-form auxiliary engine, remotely controlled from the bridge, drives the propellers through a gearbox and shaft.

This vessel is also unusual in its cargo tank layout. Sub-division is considerable to reduce the surface area of free liquid and eight different grades can be carried, including solvents.

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History of the Royal Australian Naval Reserve (Sydney Port Division)

On 20th August, 1966, the Sydney Port Division of the Royal Australian Naval Reserve transferred to H.M.A.S. "Watson" from H.M.A.S. "Rushcutter" which had been its home since 1900. This transfer became necessary mainly because of the additional space needed for training the increasing numbers now enrolled in the Reserve, and to make use of the better training facilities available at "Watson", in order that the Reserve can properly fulfil its role of support to the Permanent Naval Forces in this technical and electronic age, should the necessity again arise as it did in 1939.

The R.A.N.R. has come a long way since 1861 when Captain Hixson, R.N., formed the N.S.W. Volunteer Naval Brigade, primarily to assist in the manning of colonial ships. However, their early training was directed towards manning shore batteries, and in 1869 the Brigade took over the entire responsibility for the manning and upkeep of the battery at "Pinchgut" (Fort Denison), and remained in occupation until 1900 when the Sydney Harbour Trust took over this island. One of the conditions was that the light should be kept burning at night and that the fog signal be sounded during foggy weather. Firing practice was carried out at weekends at a target moored about 1000 yards away near Bradley's Head and, when harbour traffic became too heavy, they moved to George's Head and later to Middle Harbour to carry out practice.

In 1882 H.M.S. "Wolverine", a 22-gun screw sloop which had been paid off by the Admiralty, was presented to the Colonial Government, who desired the vessel for sea training of the Brigade. Unfortunately the sea training never eventuated and the ship was only manned in the harbour on weekends and holiday periods. This was not very satisfactory, and in 1889 "Wolverine" was sold to private interests for use as a collier and no other ship was available as a replacement.

Over the years the Brigade continued to grow, and although it lost some of its naval character due to lack of training facilities in ships,

and some of its members were absorbed into land defence forces, its strength at the end of 1900 was 416.

A group of volunteers called the New South Wales Naval Artillery Volunteers saw service during the Boer War in South Africa just before the turn of the century, and this is commemorated in a plaque in the Sydney Town Hall.

In 1900 a contingent of the Naval Brigade saw service in China during the Boxer Rebellion, returning to Sydney in 1901.

When the Naval Brigade vacated "Pinchgut" in 1900 they transferred their activities to Rushcutter's Bay, where the present drill hall was transferred from Port Macquarie.

After Federation, the various Naval Volunteer groups were amalgamated into the Commonwealth Naval Brigade, and some time later the name was changed to the Naval Militia, and in 1913 to the R.A.N.R. (M).

Compulsory training was introduced in 1911, and the numbers of Reservists increased right up to the declaration of war in 1914, when about 1600 members served with the R.A.N., this number increasing to about 2800 by 1919, and in addition, an average of 3000 cadets was in training during these years.

Between the two World Wars training, including a further period of compulsory training, continued at Rushcutter's Bay Depot, which was staffed by members of the R.A.N. Auxiliary Services.

During the late 1930's it was decided that the R.A.N.R. would be trained to play a large part in

anti-submarine warfare, and the Anti-Submarine School was built at Rushcutter's Bay in 1938 and an extensive training scheme put into operation to train both officers and sailors in this medium. Many yachtsmen were commissioned into the R.A.N. Volunteer Reserve and qualified in this regard, and when war was declared in 1939 a considerable number of these officers were ready and available for service in the Royal Navy as well as the Royal Australian Navy, and acquitted themselves creditably in the fight against the deadly submarine.

When war appeared imminent in 1939, many Reservists volunteered for service prior to the actual declaration of war and were used in varying ways, such as guarding ammunition depots and fuelling installations in and around Sydney. These activities continued after general mobilisation. Others were used to man Port War Signal Stations and Boom Defences; many sailors who had qualified in gunnery sailed in merchant ships to man the guns fitted as a defence against raiders and submarines; signalmen were used in the erstwhile passenger liners conveying our troops overseas; writers and stores assistants were used in the growing paper war and in recruiting and kitting up the growing numbers of young men who flocked to join the R.A.N.R.; others hurriedly joined the destroyers that later achieved fame as the "Scrap Iron Flotilla" and did not see their homes again until many months had elapsed; some later served in submarines of the Royal Navy;

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many were trained and employed in mine and bomb disposal, one of the most hazardous occupations; quite a number were drafted to ships of the Fleet to take their places alongside the sailors of the Permanent Naval Forces; and so it went until Reservists or "Rockies" as they were known, were employed in almost every phase of naval activity.

The training between the wars had not been as intensive as it is today, and these young men had a lot to learn—but learn they did—having a background of that most essential qualification—seamanship.

They served in all theatres of war, in all types of ships from small patrol boats and minesweepers to large aircraft carriers and battleships of the Royal Navy.

As the years rolled by they almost completely manned the Armed Merchant Cruisers and minesweepers of the R.A.N., as well as serving in smaller numbers in the larger cruisers, and when the Armed Merchant Cruisers were converted to transports for the Army they still manned these ships as well as the small landing craft which transported the soldiers from the transports to the beaches.

The R.A.N.R. grew up during these grim years. It did not take long for the R.A.N.R. badges on their uniforms to disappear, and they soon looked and acted the same as their Permanent Naval Force counterparts. Many officers were to be promoted to command their own ships, and many sailors achieved the rating of Petty Officer and Chief Petty Officer, fulfilling the same requirements as their P.N.F. brothers. Many of them received decorations—in fact some R.A.N.R. officers were among the highest and most decorated officers throughout the R.N. and R.A.N.—and many of them made the supreme sacrifice.

Then came the end of the war, when, of the total of about 39,000 serving in the Naval Forces, over 30,000 were Reservists. Many were glad to be demobilised and revert to their civilian occupations, build homes and raise families. Some, however, transferred to the R.A.N.

and have since then carried on their careers with much credit.

The R.A.N.R. as an active training unit lapsed, and it was not until the end of 1949 that Reserve Training recommenced at Rushcutter's Bay, which had by now become H.M.A.S. "Rushcutter".

This establishment had grown beyond all recognition in the previous ten years. The park at the northern end of the old depot had been "borrowed" from the local authorities and temporary living quarters and administration buildings had been built to cope with the vastly increased numbers necessary to maintain the depot and carry out recruiting and training.

A nucleus of those who had served during the war commenced the training of new recruits. Not many of the wartime officers and sailors continued on, and of these quite a number have not continued in an active capacity—the pre-war Reservists can be counted on the fingers of one hand—but the remainder of these dedicated people have built up a strong, virile body of Reservists who are being trained to again support the Permanent Naval Forces should another emergency arise.

An example of the increased efficiency of the R.A.N.R. is that H.M.A.S. "Wagga", an ocean minesweeper, was allocated to "Rushcutter" for reserve training purposes for several years; fully manned by Reservists. She carried out training cruises to places such as Melbourne, Hobart, Brisbane and as far as Noumea. Such a scheme would not have been possible prior to 1939. Unfortunately, "Wagga" came to the end of her effective life and had to be paid off, but S.D.B. 1321, a much smaller craft, has been put to good use by the R.A.N.R. since then. This vessel has been used as starting boat for

the Hobart Yacht Race for many years, and is also familiar to yachtsmen competing in the Annual Montague Island Race as the Communications Guard Ship for that event for quite a number of years.

Alterations have taken place at "Rushcutter" since 1949.

The park has been returned to the authorities from whom it was "borrowed" and the living accommodation has been torn down. The Anti-Submarine School has been transferred to "Watson". Other units of the R.A.N. such as the Diving School have been based at "Rushcutter", and there is less available room and additional personnel to occupy it.

Training has become much more intensive in this electronic age, and it has been necessary over the years to have various training activities carried out simultaneously at H.M.A.S. "Penguin", H.M.A.S. "Watson", H.M.A.S. "Kuttabul" and H.M.A.S. "Waterhen"—all shore establishments in the Sydney Port Division.

The Reserve has grown up, and at the same time it had outgrown "Rushcutter" and therefore it became necessary to make other arrangements whereby the Reservists could be trained as far as possible at the one location. Thus the move to "Watson" on 20th August, 1966, so that full use may be made of the infinitely superior training facilities available at that location.

To the younger members this may not mean a great deal, but to the older members who have been attached to the R.A.N.R. for periods of up to thirty years, this break with the traditional home of the R.A.N.R. in Sydney came as a sad parting from the depot that has served so well for so many years, and which they trust that they in turn have also served well.



THE NAVY LEAGUE BALL IN N.S.W.

A Pictorial Record

The annual Ball was held in the Hotel Australia on Friday evening, 4th November, 1966. Guests of Honour were the Governor of New South Wales and Lady Cutler. Some 350 guests were present and the Ladies' Ball Committee are to be congratulated on what was for all persons present a most successful and happy evening.

(Photographs reproduced are by courtesy of the Sun-Herald and Sunday Telegraph newspapers)



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SWEDISH TRAINING SHIP TO VISIT AUSTRALIAN WATERS

EXCLUSIVE RELEASE

Details have just been released concerning the visit to Australian waters by the Royal Swedish Navy's Minelayer H.Sw.M.S. "Alvsnabben" (see photograph), which vessel is also the Cadet's Seagoing Training Ship, "Alvsnabben", under the command of Captain N. Lennart Lindgreen, R.Sw.N., after visiting Tunis, Alexandria, Port Said, Aden, Colombo and the Cocos Islands will call at Fremantle, Hobart and Sydney, in the course of a six months' training cruise.

After leaving Sydney, the "Alvsnabben" is scheduled to call at Wellington (New Zealand), Pago Pago, Honolulu, San Francisco, Puntarenas, Nassau and Dublin, returning to Marstrand in Sweden on the 6th May, 1967.

An item of particular interest, is that one of the 100 cadets training in the "Alvsnabben", is His Royal Highness Prince Carl Gustaf, the Crown Prince of Sweden (see photographs).

TRAINING OF H.R.H. CROWN PRINCE CARL GUSTAF IN THE SWEDISH ARMED FORCES



The fleet minelayer and Cadets' Seagoing Training Ship, ALVSNABBEN.

The preliminary cruise schedule indicates that the "Alvsnabben" will be in Fremantle from the 9th-13th January; Hobart, 20th-23rd January and Sydney, 26th (Australia Day)-30th January, 1967.

It is anticipated that the ship will be open for public inspection, also that Australians will be given the opportunity of entertaining the 286 members of the ship's company.

H.R.H. Crown Prince Carl Gustaf entered the Royal Swedish Naval Academy at Nasbyark on 1st June, 1966. Before commencing training, he took part in various entrance tests and examinations.

His military training will last about two years which corresponds approximately to the training programme for officers in the naval reserve. The purpose of this training is that the Crown Prince should

gain a practical working knowledge of the Swedish national defence and of the demands that the compulsory military training makes on every Swedish citizen.

To consolidate the military training, it will be given mainly as offi-



His Royal Highness Prince Carl Gustaf, the Crown Prince of Sweden.

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cers' training at a military academy of a special service branch. The Crown Prince himself chose the Navy and the Naval Academy. The training programme will also include training in the Army, the Air Force and the Royal Swedish Coast Artillery. The Crown Prince will therefore attend courses at the Army Academy, Karlberg, and at the Air Force Academy, Uppsala.

During the first summer, the Crown Prince received practical instruction in seamanship, sailing, boat handling, signalling, gunnery, elementary navigation and infantry drill. The training programme also comprised four weeks' sailing on board the training schooner "Falken". After the summer term, the Crown Prince was appointed 2nd class sailor and then boarded H.S.W.M.S. "Alvsnabben" for the 6 months' cruise around the world.

During this cruise, he will practice ship's duties and be given tactical training, based on the theoretical knowledge acquired at the Naval Academy. The instruction officers from the Naval Academy are berthed in the Alvsnabben for the cruise. In the summer of 1967, the Crown Prince, by then appointed a Corporal, will study torpedo boat operations on board one of the new Swedish torpedo boats. Then, he will study for about four months at the Army and Air Force Academy.

That period will also comprise educational visits to various military commands, i.e. to that of the island of Gotland in the Baltic. The training programme will also comprise two weeks' service in the Swedish Coast Artillery.

In the summer of 1967, the Crown Prince will be appointed Naval Cadet 2nd class.

The Crown Prince will become a Midshipman in the autumn of 1967 and spend the winter at the Royal Swedish Naval Academy studying among other things: naval history, naval operations, leadership with psychology teaching and instruction, weapon systems, weapon components, ship's organization and regulations and foreign languages.

The physical education programme includes one week of winter training in Northern Sweden. Short courses are planned on board Swedish icebreakers and in the Air Force.

In the summer of 1968, the Crown Prince will join a motor torpedo boat for about one month, of a junior officer. Graduation will then follow at the Naval Academy, Nasbypark, in the autumn of 1968.

The Minelayer "Alvsnabben" (Minfartyg)

Laid down in October, 1942, the "Alvsnabben" was originally designed as a merchantman, but she was purchased by the Navy and her design changed.

Displacing 4,250 tons (standard), "Alvsnabben" is 334 2/3 feet in overall length, beam is 44 1/2 feet and her draught 16 feet.

Armament consists of two, 6-inch guns (single stern mounts); two, 5.7 mm. (single forward turrets) and two, 40 mm. anti-aircraft guns, all of Bofors design.

She can carry a large number of mines and is especially designed to drop them quickly.

Her propulsion machinery is a diesel engine (single screw) giving a maximum speed of 14 knots.

The 47-year-old commanding officer of "Alvsnabben", Captain Lindgreen, is an aide-de-camp to H.R.H. Prince Bertil of Sweden and is also a Member of the (British) Royal Victorian Order.



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KENYA

— News from a Growing East African Navy

The three 103-ft. patrol boats built by Vosper for the Kenya Navy have now been completed, the first, K.N.S. "Simba", having been handed over at the end of May.

"Simba" (meaning lion), is commanded by Lieutenant Commander A. J. D. Coxon, R.N., who is Senior Officer of the Kenya Patrol Craft Squadron. The ship's company of 24 is made up of Kenya and Royal Navy officers and ratings in equal numbers. Kenya Navy personnel have been training at Portsmouth in the last few months, and the R.N. personnel are on loan service with the training team that started the Kenya Navy two years' ago.

After local exercises and work-up at Portland the Squadron sailed for Kenya on August 22 and arrived at their base at Mombasa on October 4. The commissioning ceremony of the Squadron took place at H.M.S. "Vernon" on July 28. This will be

the first time that the Kenya Navy Ensign has been seen in Portsmouth.

"Simba" spent several weeks running in local waters around Portsmouth, testing equipment and training the crews of all three craft before they left for Mombasa, where the boats are used on customs patrol, fishery protection and coastguard duties. All ships of the class have welded steel hulls and Paxman diesels giving speeds over 20 knots, and are air-conditioned and fitted with roll-damping fins. They have round-bilge hulls with a transom stern; there is a marked flare forward, broken at a knuckle, helping to deflect spray.

In December, 1964, the Kenya Navy was officially inaugurated under the command of Commander Walker, and the first order for Kenya's own warships was announced—the three FPB's built by Vosper.

The "Simba" class, of course, has already been used by other Commonwealth Navies. In particular, 10 boats of this type have been used by the Royal Malaysian Navy in operations against Indonesian infiltration around Singapore, Malaya, Sarawak and Sabah, where they have proved so valuable that the Malaysian Defence Ministry has now ordered a further 14.

Kenya has received a gift of £1,300,000 from Britain as part of the long-term aid programme, and £750,000 of this represents the cost of the new craft. The balance has been devoted to expanding the Naval base at Mombasa and to the purchase of maintenance and training equipment.

The first cadets of the Kenya Navy are currently under training at the Britannia Royal Naval College, Dartmouth.

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Nautical Notes from All Compass Points

By SONAR

ARGENTINA

REPLACEMENT FOR CORSAIRS

(refer notes in May/July, 1966 edition, page 39.)

Argentina's "Aviacion Naval" has found a replacement for its recently retired F4U-5 Corsairs in 40 Sud-Aviation Fennec (North American T-28A trainers converted to essentially similar standards as the T-28D) light attack aircraft from a batch of 100 declared surplus by the French government last year. Previously, efforts had been made by the USA to re-purchase the aircraft from France as USAF stocks of T-28A trainers available for conversion to T-28D COIN aircraft are now exhausted.

PURCHASE OF SKYHAWKS

Sale of 25 of the 50 refurbished Douglas A-4B Skyhawk light attack aircraft to Argentina has been suspended pending a review of the supply of these aircraft resulting from Congressional complaints that the aircraft are needed by U.S.N. reserve formations.

BELGIUM

NEW LOGISTIC SUPPORT AND COMMAND SHIP

(see photograph)

An unfamiliar sight in the English Channel recently has been the new Belgian naval vessel "Godetia" carrying out sea trials. This novel logistic support and command ship was built for the Royal Belgian Navy by Jos Boel and Zonen, Temse, with main engines built under licence by Ateliers de Con-

structions Electriques de Charleroi S.A., Ghent.

With a displacement of 1,700 tons light and 2,300 tons full load she has an overall length of 301 feet and a beam of 46 feet, and is armed with four 40 mm. anti-aircraft guns in two twin mountings disposed one forward and the other aft. Her main propelling machinery comprise four M.A.N. diesels turning two shafts and aggregating 5,400 brake horse power equal to a speed of 19 knots. Her range at economical speed with two engines is 6,000 miles at 15 knots. Her ship's company numbers over 100 officers and ratings, and her accommodation includes Royal Apartments and 35 spare billets.

On very pleasing and rakish appearance she has an uncluttered layout of decks and superstructure which allows the provision of a platform which can take a light liaison helicopter. Controllable-pitch propellers give her good manoeuvrability. She was built in a remarkably short time, having been laid down on February 15, 1965, launched December 7, 1965, and completed in June, 1966.

CANADA

BLASTS TESTS

R.C.N. scientists have just conducted a series of tests to see how Canadian-built destroyers can stand up to near-miss explosions. The 2,900-ton "Restigouche" class destroyer "St. Croix" was used for the tests, which took place at a U.S. Navy range off California.

The 226-man crew and 20 test-team members on board were subjected to large-scale underwater detonations, the biggest of which was caused by the equivalent of more than seven tons of TNT. Although the Defence Department did not release full details of the detonations or their range from the ship, it was said that the blast was powerful enough to have flattened a house or a car at the same distance. The Department also stated that the test blast was believed to be the heaviest known peacetime shock ever experienced by an operational destroyer.

The results, which have been assessed in detail at Canadian Forces Headquarters, show that "destroyers can take it". Although



The Belgian warship "Godetia", showing her uncluttered decks.



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there was ample evidence the "St. Croix" had been through the test, her hull remained seaworthy and there was no major damage. Her gas-tight capabilities were retained. The only personnel casualty, thanks to the precautions taken, was a bruised thumb suffered by a sailor when a clock fell from a bulkhead!

In 1965 the "St. Laurent" class destroyer escort "Fraser" underwent blast test off Hawaii, but these were aerial explosions.

Both the "St. Croix" and "Fraser" tests were continuations of similar trials held off Florida four years ago when the destroyer escort "Chaudiere" and the minesweeper "Fundy" were subjected to smaller explosions.

SEAWEED CULTIVATION

Seaweed cultivation studies have been launched at the Atlantic Laboratory of the National Research Council of Canada. They were started after processors expressed concern that known sources of seaweed supply would not be sufficient to keep pace with future demand, a view emphasised at the fifth International Seaweed Symposium held at Halifax in 1965.

The value of seaweeds harvested in Nova Scotia, New Brunswick and Prince Edward Island is about \$1,000,000 a year, and extracts obtained from species such as Irish moss, kelp and rockweed find more than 40 different uses in food, pharmaceutical and textile industries and in agriculture.

Recently a company was formed to harvest seaweed on the west coast of Vancouver Island. The provincial government paved the way for the operation by passing legislation amending the Fisheries Act to allow 21-year licences for the commercial harvesting of aquatic plants. Under the old law only one-year licences were granted.

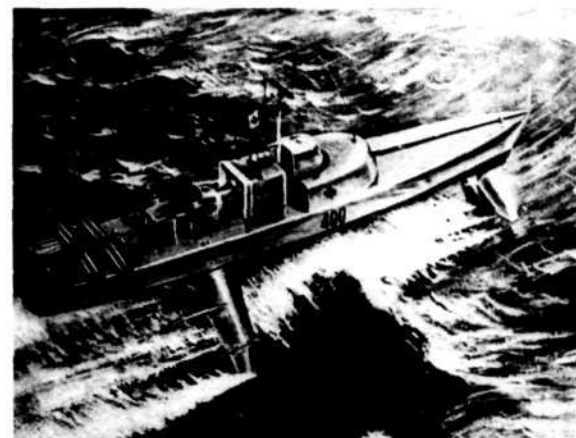
HYDROFOIL SHIP PROTOTYPE

—FHE 400
 (see photograph)

The Royal Canadian Navy has proceeded with design and construction of a 200-ton, 150 foot, anti-submarine hydrofoil ship prototype, having a 22,000 h.p. gas turbine engine. This ship will employ a foil system which is entirely surface-piercing and of canard configura-

tion. She'll operate at speeds up to 70 m.p.h. on the open sea. This programme is being watched with interest in the U.S., because the novel approach may very possibly

develop into a more economical type to construct and yet retain satisfactory sea-keeping performance without need of automatic controls.



Artist's impression of Canada's FHE 400 Hydrofoil Sub-chaser

CHILE

The Chilean Navy has recently acquired two more Beech T-34 Mentors to supplement four already in service. The second DC-6B has also reached the Chilean Air Force, supplied through the U.S. M.A.P.

PEOPLE'S REPUBLIC OF CHINA

RED CHINESE RESEARCH SHIP

Communist China has built its first ocean research ship, the 2,500-ton "Tungfanghung" (The East Is Red), a product of the Hutung Shipyard, Shanghai. A Peking announcement says the vessel will conduct "research in such fields as hydrology, meteorology, geology, physics, chemistry and marine biology, utilizing its many well-equipped laboratories and a variety of winches and special devices for marine study". The ship is described as being specially constructed for ease in manoeuvring "and its design incorporates some highly complex techniques".

FRANCE

SEPECAT JAGUAR

A shipboard version of the Anglo-French (SEPECAT) Jaguar trainer and strike fighter is to be developed for France's "Aéronavale" which will operate the type as a successor to the Etendard aboard the carriers "Foch" and "Clemenceau", the useful lives of which are to be extended until at least 1980 by modernisation. Total Jaguar procurement is now expected to exceed 400 aircraft, and a combined delivery tempo of eight aircraft per month is anticipated by 1971 from the French and British assembly lines. Prototypes are being built both in France and the U.K., and the first of these will fly in 1968.

HOLLAND

As reported in the last edition an order has been placed for 12 Wasp helicopters.

These machines are for operation from the six new frigates of the "Van Speyk" class. Two of these vessels have already been launched

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and two others are under construction.

The Wasps will be equipped as weapons carriers for the A.S.W. role.

HONG KONG REACHING FOR THE STARS

An aid to the teaching of celestial navigation to fishermen has been developed in laboratories of the Department of Agriculture and Fisheries at Aberdeen, on Hong Kong Island. Known as the Planisphere, it reproduces the stars of the Northern Hemisphere as seen in the same latitude as Hong Kong.

Its purpose is to provide young fishermen with a good idea of where to look for the stars that matter, how to bring the star down to the horizon, and how to take an azimuth. One thing it can't do, however, is to simulate a ship's roll.

The "stars" shine through a large glass-fibre dome. There are 346 of them, each having its own bulb behind a plastic window that makes it twinkle. Sizes and colours vary, to simulate the natural sky more closely.

The dome itself rotates slowly, taking one hour to simulate a full 24-hour cycle of sunrise, daytime, sunset and darkness.

The Planisphere, originally developed for an exhibition, was built for about £100 by a local boat builder. Other fishing authorities in the Pacific are showing interest in acquiring such a simulator.

IRAN ARMS ORDER

Iran is to buy five destroyers, other naval craft and ground-to-air missiles worth approximately \$A55.6 million from Britain.

The destroyers, four newly built and one refitted, are due to be delivered in the early 1970's.

MALAYSIA PATROL BOATS

KD "Tombak", fifth of the 14 diesel-engined patrol craft being built by Vosper for the Royal Malaysian Navy, has been launched at Portsmouth by Puan Lim Taik Choon, wife of the Deputy Malaysian High Commissioner to the U.K.

The present order for 14 of the "Sri Sabah" class was confirmed in



A model of the Yarrow CODOG frigate, ordered by the Royal Malaysian Navy.

June, 1965, and is reported to be worth about three million pounds. The boats are variants of the standard 103 ft. Vosper design, especially adapted to meet the requirements of the Royal Malaysian Navy.

When complete, the Royal Malaysian Navy's fleet of patrol craft of this type will number 24, but Vosper are also building four 50-knot gas-turbine-powered FPB's for the R.M.N. and these, too, are nearing completion.

KD "Tombak", like the rest of her class, will be armed with 40 mm. bofors and carry two rocket-flare launchers.

NATO HEADQUARTERS BASE IN HOLLAND

NATO has accepted Holland's offer to house the headquarters of Allied Forces Central Europe, now at Fontainebleau, near Paris.

The Dutch Foreign Minister, Dr. Joseph Luns, told Parliament that the headquarters would be at Brunssum and at Maastricht in the southern province of Limburg.

NATO's Supreme Headquarters Allied Powers, Europe will be based in Belgium.

NEW ZEALAND R.N.Z.N. TO HIRE H.M.S. BLACKPOOL

The British and New Zealand Government have agreed to arrangements for the hire of a "Type 12" frigate to the Royal New Zealand Navy to replace H.M.N.Z.S. "Royalist" on paying off. The frigate to be transferred is H.M.S. "Blackpool". The period of hire will be between four and five years and during this time the R.N.Z.N. will bear all

operating and maintenance costs including refits.

SOUTH AFRICA

NAVY'S MASSIVE GROWTH

Increased Naval responsibilities have led to a massive expansion of the South African Navy. The extension of the territorial water limit from three to six miles as well as the fixing of a six-mile fishing zone means more ships and men.

The naval modernisation programme included the conversion of two old destroyers into helicopter-carrying offensive patrol vessels.

Since 1960 three new "President" class frigates have been bought. The frigates incorporate the latest anti-submarine equipment. They were fitted out in South Africa with helicopter decks.

Since 1961 a large section of South African industry has been geared to defence production. These factories are turning out a wide variety of equipment ranging from armoured cars to ammunition.

The Defence Research Council was established in 1961. Expenditure by the Council has increased from 300,000 rands in 1962-63 to several millions rands a year today.

Another indication of the vast expansion of the country's defence strength during the past five years is the expenditure on uniforms, camp equipment and general defence needs from 1.5 million rands to 8 million rands a year.

UNITED KINGDOM BOAT IN A BOOT

The Avon Rubber Company of Britain have introduced an inflatable high-speed boat, the "Red Swift", which when stowed into its cases will fit into the boot of a car.

Happy Christmas and Prosperous New Year to all Members of the R.A.N. from . . .

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The boat is 10 ft. 6 in. long with a beam of 5 ft. It has a wooden transom, floorboards and stringers (lengthwise beams) and weighs 104 pounds complete.

NEW HELICOPTER

The R.N. is to get a new anti-submarine helicopter known, at the moment, as the SH-3D. Although it has been announced that the Navy Department has approved the order in principle, little detail was given about the equipment to go in the helicopter although it is understood that the British hardware incorporated in the largely American-design helicopter will be revolutionary in many respects.

The SH-3D will be built in the U.K. by Westland Aircraft Limited and will be a more powerful version of the Sikorsky "Sea King", with two Bristol Siddeley Gnome engines and British A/S equipment. A final decision to proceed will be made when design details, dates and costs have been agreed between the Ministries of Defence and Aviation and the company.

It will be armed with homing torpedoes and Sonar equipment by the Marine Systems Division of the Plessey Electronics Group; Ekco Electronics will be responsible for the radar and tactical co-ordination equipment; Marconi will provide the Doppler navigation equipment and Louis Newmark will supply the all-weather flight-control system.

Although primarily designed to find and kill submarines in all weathers, day and night, it will be a versatile aircraft also capable of carrying 20 fully-equipped troops.

UNITED STATES OF AMERICA

TOWED SONAR FOLLOWS SUBS.

A new towed-array sonar system — as long as a football field — that is said to be capable of following submarines far beneath the surface is being built by Hughes Aircraft Co. for the Navy.

The system is trailed on a cable far behind the ship and, when necessary at great depth. It is less affected by interference noises generated by

the mother ship than present systems.

Brubaker said the programme is in its third year at Hughes under funding from the Bureau of Ships.

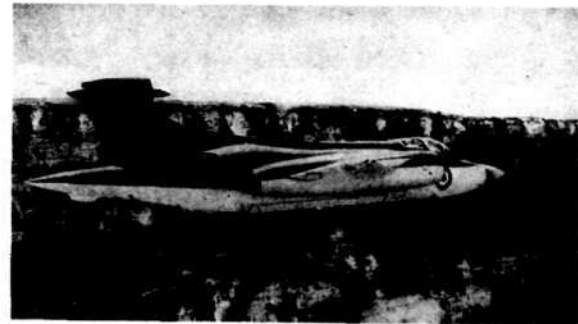
The multiple hydrophones (instruments for listening to sound through water) of the relatively lightweight system are arranged along a long, flexible string, resembling a multi-sectioned fire hose. In earlier sonar configurations, the hydrophones were in clusters.

The system has been undergoing evaluation tests off California and Hawaii. A Hughes research-test vessel was used with a Navy submarine.

In addition to the flexible underwater array, about three inches in diameter, the sonar system consists of five cabinets of processing and display equipment, Brubaker said.

BUCCANEERS FOR THE R.N.

Hawker Siddeley Aviation has been given an initial Ministry of Aviation order for supply of a further unspecified number (part of the original requirement for 100 aircraft) of Buccaneer Mk. 2 aircraft to the Royal Navy (see photograph) H.S.A. will handle production of these aircraft at Brough. Two squadrons equipped with this aircraft are now in operational service. Recently an aircraft of No. 801 squadron from H.M.S. "Victorious" made a 2,300 miles non-stop flight from the Irish Sea to Gibraltar and back.



The British Buccaneer Mk. 2

A.S.W. HELICOPTER

The U.S. Navy is reducing drastically procurement of the Gyrodyne QH-50C Dash drone anti-submarine warfare helicopter. U.S. Navy spokesmen have stated that the Honeywell Asroc ASW missile is making good progress and promises to provide a better anti-submarine weapon than the QH-50C. Nevertheless, the U.S. Navy is renewing its studies on the possible need for a small manned ASW helicopter suitable for operation from destroyers. The "Dash" concept employing the QH-50C drone has the major drawback that current guidance techniques prohibit deployment beyond line of sight.

THE SILENT WAR

Navy intelligence has identified more than 30 Soviet submarines on regular patrol duty in the Atlantic and Pacific oceans. The Navy says "several" of the Kremlin's missile-firing submarines now stand on station several hundred miles off the East and West coasts of America.

WORK FOR THE FLEET

The Navy's carrier-based planes are now getting a bigger share of the bombing raids over North Vietnam. Heavy losses suffered by the Air Force F-105 jet fighter-bombers flying from bases in Thailand prompted the Pacific command to shift more of the load to the carriers. The Navy now shares five of the six "packages" (areas for air operations) in North Vietnam.

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SHRIKE MISSILE

Texas Instruments Inc., Prime
contractor for the guidance, control
and airframe sections of the
"Shrike" air-launched anti-radiation
missile, has been awarded a
\$3,500,000 follow-on contract from
the U.S.N. Air Systems Command
for production of the missile, lifting
its total awards for the pro-
gramme to nearly \$32,000,000.
"Shrike" has homing capability
against radar installations.

HYDROFOIL GUNBOAT ORDERED

The United States Navy has
awarded a \$3.6-million contract to
the Grumman Aircraft Engineering
Corporation for the design, con-
struction, and testing of a prototype
hydrofoil patrol gunboat.

The craft, designated PG (H), will
be 75 feet long, have a beam of
22 feet and will displace 57 tons.
Its hydrofoils will be submerged
while cruising. The foils are con-
trolled by an auto-pilot system
manufactured by the Garrett Cor-
poration.

The propulsion system of the
patrol boat will be a 3,600 horse-
power marine version of the Rolls-
Royce "Tyne" gas turbine engine,
driving a pusher propeller mounted
on the end of a tail strut pod. Tur-
bine and propeller are to be linked
through a novel right angle trans-
mission built by the Indiana Gear
Works.

The hullborne propulsion system
will be comprised of two General
Motors diesel engines driving twin

water jets manufactured by the
Buehler Corporation.

The speed, range and other per-
formance characteristics, as well as
weapons equipment of the PG (H)
are classified.

Grumman has built other hydro-
foils, including an open ocean
hydrofoil craft, the "Denison",
which was constructed for the U.S.
Maritime Administration and went
into service with the Navy last year.
The "Denison" is an 80-ton vessel
with a rated speed of 60 knots.

TA-4F DELIVERY

The first three Douglas TA-4F
Skyhawk trainers have been deliv-
ered to U.S. Navy Training
Squadron VA-125 at Lemoore
Naval Air Station, California.
Delivery was made ahead of sched-
ule following Navy trials with the
TA-4E prototypes at Patuxent River.

NAVY PLANS NEW MISSILE

The Navy has announced plans
to obtain test models of the new
"Condor" missile, an air-to-ground
rocket which will be guided by a
television system in its nose.

An announcement said North
American Aviation, Inc., of Colum-
bus, Ohio, which worked out the
programme along with Northrop
Norair, has been chosen to develop
and produce the test models.

Little has been said publicly and
officially about the Condor, one of
a coming series of highly advanced
missiles which can carry conven-
tional or nuclear warheads.

It has been under development

for several years, however, and has
encountered several delays. They
have been caused partly by doubts
about the effectiveness of the tele-
vision guidance system and by com-
parison studies with other coming
missiles which have the same
general purpose.

Technical journals have described
the "Condor" as a possible weapon
for the Navy's A-6 Intruder jet
attack plane and for the Navy ver-
sion of the F-111.

According to these reports the
"Condor" would fill several needs
left open by present missile-bombs.
It would permit a pilot to control
delivery of the weapon from a dis-
tance of 40 to 50 miles, avoiding
fire from the ground and at the
same time remaining outside the
blast area of his own nuclear
weapon.

It also is described as a successor
to the Bullpup missile, in terms of
both greater range and a more ad-
vanced guidance system.

MISSILE SUBMARINE

U.S.N.'s FBM Submarine, "Will
Rogers", 41st and last of the cur-
rently programmed Polaris under-
water fleet, was launched from the
GD Electric Boat Division yards at
Groton, Conn., on July 21. When
it becomes operational, it will carry
16 A-3 Polaris missiles, with a range
of 2,900 miles. The GD Division
has now received a \$111,400,000
Defence contract to design and con-
struct four nuclear-powered attack
submarines for the U.S.N., and this
work will be performed at Groton.

Contributions Invited

The editor invites persons to submit articles and photographs for
inclusion in the magazine, but regrets that no payment can be made for
contributions submitted. Contributions should be addressed: The Editor,
"The Navy", Box C178, Clarence Street Post Office, Sydney, N.S.W.,
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SEA CADET CORPS NEWS

NEW SOUTH WALES DIVISION

Report of Activities and Training Undertaken by the New South Wales Division for the Quarter Ending 30th September, 1966

The transfer of the Headquarters Staff of the A.S.C.C., New South Wales Division from H.M.A.S. "Rushcutter" to H.M.A.S. "Watson" took place concurrent with the establishment of the R.A.N.R. Sydney Port Division within the N.D. and T.A.S. School, Sydney.

Two officers, two instructors and 10 cadets were indeed fortunate to be able to participate in continuous training at sea in H.M.A.S. "Melbourne" and H.M.A.S. "Vendetta" from 26th August to 5th September. Care was taken with the selection of cadets for this posting to ensure that the utmost benefit would be derived from this form of invaluable training which for obvious reasons can only be made available on rare occasions. Apart from general keenness and efficiency, one of the main stipulations was that each cadet must have indicated to his Commanding Officer a desire to join the Royal Australian Navy, the Royal Australian Naval Reserve or to remain in the A.S.C.C. as an instructor.

No periods of continuous train-

ing were carried out in shore establishments during the quarter under review but harbour and weekend training was conducted in the following ships and establishments:—

H.M.A.S. "Albatross", 15th-17th July.

H.M.A.S. "Creswell", 15th-17th July.

H.M.A.S. "Sydney", 29th-31st July.

H.M.A.S. "Vendetta", 29th-31st July.

H.M.A.S. "Sydney", 5th-7th August.

H.M.A.S. "Vendetta", 5th-7th August.

H.M.A.S. "Creswell", 12th-14th August.

H.M.A.S. "Sydney", 19th-21st August.

H.M.A.S. "Vendetta", 19th-21st August.

H.M.A.S. "Vendetta", 9th-11th September (at Newcastle).

H.M.A.S. "Watson", 16th-18th September.

The Annual Athletics Meeting for all Units was held in Cahill Park, Arncliffe on Sunday, 18th September, and it was pleasing to see such a large gathering of parents to watch their sons participate. T.S. "Tobruk" were the winners of the points score trophy, closely followed by T.S. "Albatross" in 2nd place and T.S. "Sirius" 3rd.

This year, as in 1965, one of the Country Units T.S. "Albatross" has achieved the distinction of being adjudged the most efficient Unit within the New South Wales Division. This Unit situated in Wollongong will be inspected shortly by the Director of Naval Reserves, as will the top unit in each Division, with a view to selecting the Unit said to be the most efficient in Australia.

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H.M.A.S. MELBOURNE — Aircraft Carrier

(Submitted by Master John Maher,
aged 13½ years)

H.M.A.S. "Melbourne" is one of the first aircraft carriers of the Royal Australian Navy. The "Melbourne", formerly of the British Majestic class, being the ex-H.M.S. "Majestic". She was launched on the 28th of February, 1945, by Lady Anderson, the wife of the Chancellor of the Exchequer at this period. At the end of the Second World War she was still incomplete, work was virtually stopped pending a decision as to future naval requirements. Full-scale work resumed in 1947, after the Australian Commonwealth Naval Board had made arrangements to take the "Majestic" (cost £A8,39,000). After the decision to take her over she underwent reconstruction and modernisation (in Great Britain) — this included the increasing of her flight deck for modern aircraft at that period. In 1952 she was fitted with a 6 degree angle deck, steam catapult and mirror deck landing sights being necessary for modern aircraft which she was receiving at this time and was transferred to the R.A.N. on completion. She was commissioned and renamed at Barrow Furness on 28th October, 1955, sailed from Portsmouth on 5th March, 1956. She became flagship of the Royal Australian Navy on 5th March, 1956. It has been officially announced that the "Melbourne" would remain in commission after 1963 as an anti-submarine helicopter carrier.

In the present "Melbourne", three

types of aircraft are carried, these being the Gannet, a twin-engined anti-submarine aircraft. "Sea Venom", a two-seater, all weather interceptor jet fighter. The third is the Westland Wessex anti-submarine helicopter but the Navy is to receive 10 Douglas A-4E Skyhawk Shipboard Attack Bomber to replace the obsolete Sea Venom and, also, the Navy is receiving 14 Grumman S-2E four-seater Shipboard Anti-submarine Aircraft to replace the Gannet — these will greatly increase "Melbourne's" fighting power and our Fleet Air Arm.

STATISTICS

H.M.A.S. MELBOURNE

Standard displacement: 16,000 tons. Full load displacement: 20,000

tons. Length: 701½ feet. Draught: 25 feet. Anti-aircraft guns: 25-40. Aircraft: 22-27. Complement: 1,200. Propelling Machinery: Parsons geared turbines. Shaft horsepower: 40,000. Boilers: 4 Admiralty. Speed: 24½ knots. Name: "Melbourne". Begun: 15th April, 1945. Completed: 8th November, 1955. Engineers: Builders: Vickers-Armstrong Ltd., Barrow.

Editor's note: It is indeed most gratifying to hear of at least one young man sufficiently interested in the R.A.N. to write an article for the magazine — well done, John. I would be delighted to receive articles of naval interest from other young people interested in the fighting services.



H.M.A.S. "Melbourne" at Garden Island, Sydney.
Photograph by Courtesy—Master John Maher

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VISIT TO AUSTRALIAN WATERS BY UNITS OF THE BRITISH FAR EAST FLEET

EXERCISE "SWORDHILT"

The largest maritime exercise ever held in Australian waters began on Sunday, 16th October. A total of 24 surface ships and an undisclosed number of British and American submarines participated in the exercise.

PHASE I

In the first phase, Australian Naval forces (H.M.A. Ships "Melbourne", "Sydney", "Hobart", "Vampire", "Vendetta", "Duchess" and "Derwent", in company with H.M.N.Z.S. "Taranaki"; the U.S. destroyer "Taussig" of the "Allen M. Sumner" class and the U.S.S. "Boyd", a "Fletcher" class destroyer were commanded by Rear Admiral V. A. T. Smith, C.B.E., D.S.C., Flag Officer Commanding the Australian Fleet. With the assistance of maritime aircraft of the Royal Australian Air Force, they successfully located and attacked the British strike carrier "Victorious" (see photograph on front cover) which was escorted by guided missile destroyers of the "County" class, "Kent" and "Hampshire" and the "Leander" class anti-submarine frigates "Leander", "Arethusa" and "Cleopatra". The British forces were commanded by the Flag Officer, Second-in-Command, British Far East Fleet, Vice Admiral C. P. Mills, C.B., C.B.E., D.S.C.

The exercise area was approximately 4,000 square miles, embracing the Solomon and Bismarck Seas.

Phase I of the exercise was successfully completed on Monday, 17th October.

PHASE II

Participating forces repositioned for Phase II which commenced at 6.00 a.m., Tuesday, 18th October.

A combined Australian, British, United States and New Zealand task force under the command of the

Flag Officer commanding the Australian Fleet, attempted to force a passage against sustained opposition from land-based aircraft, surface ships and an undisclosed number of submarines.

A surface action group consisting of the carrier "Victorious", destroyers "Vampire" and "Boyd" and frigate "Cleopatra" under the tactical command of Vice Admiral C. P. Mills, endeavoured to prevent the successful passage of the task force.

PHASE III

Phase III began early in the morning of Monday, 24th October, and was the most complex of the exercises ever held off Australia as it involved large-scale co-operation with the Army in their exercise "Barra Winga" held in the Rockhampton-Shoalwater Bay area.

The phase was designed to exercise naval support of army operations ashore and the defence of an amphibious assault group from submarine and land-based aircraft attacks.

Troops were landed from the Australian military transport "Sydney" and the British commando carrier "Bulwark". Naval air support to the army ashore was provided by jet strike aircraft (Buccaneers and Sea Vixens) from the 35,000 ton (full load) carrier "Victorious", while the naval forces were attacked by Canberra bombers of the R.A.A.F.

Operations ashore were assisted by a naval gun fire support group of 14 destroyers and destroyer escorts, including Australia's guided missile destroyer (DDG) "Hobart".

Protection from submarine attack was provided by anti-submarine destroyers and frigates, Westland Wessex helicopters and Gannett aircraft from H.M.A.S. "Melbourne".

PHASES IV and V

Phases IV and V were conducted simultaneously and commenced at 6.00 a.m., Tuesday, 25th October.

Phase IV:

The carrier "Victorious" launched



(L. to R.) Midshipman Peter Stonestreet, R.N., Mr. Dennis Trickett, Mr. Michael Phelps and Midshipman Tony Dyason, R.N., inspecting the pilots' briefing room, H.M.S. Victorious.

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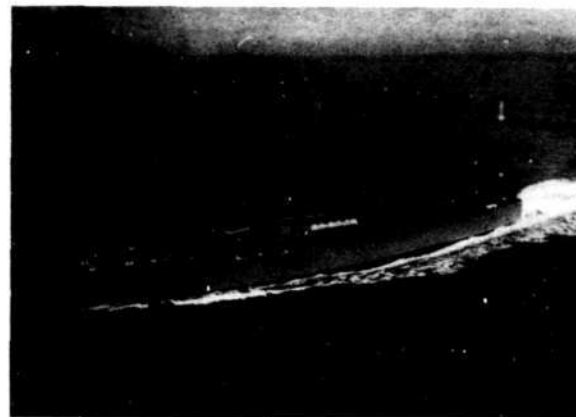
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her jet aircraft against a heavily defended R.A.A.F. base. On passage to the position from which to launch her aircraft, "Victorious" was opposed by an undisclosed number of submarines, and aircraft of the R.A.A.F.

Phase V:

Involved an anti-submarine force headed by the Flagship of the Royal Australian Navy, "Melbourne" and assisted by aircraft of the Royal Australian Air Force ("Canberra" bombers, "Mirage" and "Sabre" fighters) and the United States navy attempting to ensure a safe passage for "Victorious" against sustained submarine attack.

The maritime reconnaissance aircraft engaged during the exercise were "Orions" of the U.S. Navy, "Shackletons" of the R.A.F. and "Neptunes" of the R.A.A.F.

A special team of assessors, embarked in H.M.A.S. "Melbourne" have now commenced the long, arduous and responsible task of producing a comprehensive report on the success or otherwise of this large-scale, four national maritime exercise. The results should prove most interesting.

At the conclusion of exercise "Swordhilt", 12 British, Australian

and New Zealand warships and four Royal Fleet Auxiliaries entered Sydney Harbour on Friday, 28th October; the British ships only staying for short periods before visiting the other ports of Melbourne, Brisbane, Newcastle, Hobart, Adelaide, Albany, Fremantle, Geraldton, Darwin and Bunbury.

The British ships were open for public inspection at all ports of call and many of the visiting officers and ratings were entertained by Australian families.

In conclusion, the editor expresses his gratitude to the undermentioned officers for the courtesy and co-operation extended to him and his party when visiting units of the British Far East Fleet in Sydney: Mr. Tom Pearce, Public Relations Officer, British Far East Fleet; Lt.-Cmdr. Gallagher (H.M.S. "Victorious"), Midshipman Peter Stonestreet and Midshipman Tony Dyson (H.M.S. "Victorious"); Lt.-Cmdr. J. W. Roskill (H.M.S. "Kent") and Lt. R. Guy (H.M.S. "Oberon").

In past editions of this magazine, space has been devoted to the activities of the U.S. 7th Fleet; it is now an opportune time to briefly review the responsibilities of the Royal Navy's Far East Fleet.

THE ROYAL NAVY'S FAR EAST FLEET

The Far East Fleet, which varies in strength from between 70 and 80 ships, functions in area ranging from approximately the Maldives in the west to the international date-line in the Pacific in the east; from the Aleutians in the north to the Timor Sea in the south.

Regions for which the Royal Australian Navy and Royal New Zealand Navy are responsible are excluded from the Fleet's operational area given above, although the Royal Navy has special obligations towards them.

At the same time there is an inter-change of ships with the Middle East Command which has its headquarters in Aden and should a major Naval commitment arise, say for example off the east coast of Africa, ships from Singapore would be made available.

The distances involved are immense and sometimes not understood. From west to east, the command covers some 6,500 miles—four times the distance London to Moscow and more than twice the distance from Southampton to New York.

The stated intention of the British Government is to keep two aircraft carriers or Commando ships east of Suez in addition to other major vessels. The total manpower involved is approximately 14,000 officers and men.

One or more guided missile destroyers are normally included in the strength of the Fleet with escort squadrons of destroyers and frigates, mine counter-measure squadrons, a submarine division and a variety of essential support ships, survey vessels, boom defence vessels and Royal Fleet Auxiliary replenishment tankers and stores ships.

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- The carrier force with its aircraft, escorts, aircraft, fuel ammunition, store and food ships.

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slightly according to the aircraft
carrier serving on the Station, but
would normally include Buccaneer
low level strike aircraft; Scimitar
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weather fighters, and Gannet air-
borne early warning radar aircraft.
Both the Buccaneer and Sea Vixen
have conventional or nuclear
capabilities.

In addition to the Wessex Com-



H.M.S. KENT—Guided missile destroyer.

mando helicopters embarked in
Commando ships, anti-submarine
Wessex helicopters are carried by
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while some of the frigates now arri-
ving in the Far East are equipped
with an anti-submarine Wasp heli-
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— BOOK REVIEWS —

“SAILING INTO SOLITUDE”

Author: Val Howells,

Publisher: Temple Press, London, \$2.50.

Review by: IKARA.

Crossing the Atlantic in a small boat, although still a rather dangerous practice, has become almost fashionable these days, and only recently did Captain John Ridgway, having completed a transoceanic voyage in a rowing boat, announced that he wanted to enter the third Single Handed Trans-Atlantic Race for yachts. It is interesting, then, to read Val Howells' account of his part in the First Single Handed Trans-Atlantic Race held in 1960.

Mr. Howells was to make this journey, of more than two months duration, in a 25-foot Folkboat. The other competitors were Francis Chichester, now making a single-handed sail to Australia, and Blondie Hasler, of “Cockleshell Heroes” fame.

The author sailed by way of Bermuda, his only stop on the entire journey, which took fifty-six days actual sailing time. During this time, his only companions, for good and evil, were the sea and the boat. The story is not that of a race at breakneck speed, but that of how a man must face up to the tribulations of journeying alone, and how he must face up to himself. In his conquest of the ocean we are made to see both the insignificance and the grandeur of man.

This may sound high-flown and pretentious, but the book is primarily the story of a practical man making a journey few of us would dare to attempt. From this we can get some idea, perhaps, of how we might react to similar circumstances.

This does not mean that the book, and the author, are entirely without fault. It would not be hard for the reader to gain the impression that Mr. Howells' preparations for this journey were the most chaotic and haphazard of the four competitors. For a man who spent eight years at sea and is apparently a very good navigator, Mr. Howells' lack of preparations as far as navigation was concerned was almost suicidal. He left behind an important set of nautical tables, admittedly inadvertently, but deliberately took only one sextant, an essential instrument, and only one chronometer, which he wore on his wrist at all times, even taking in sail in a howling gale. He was quite satisfied with the accuracy of this wrist chronometer, but it only worked accurately on his wrist, so there the chronometer stayed, until it was lost overboard, an almost inevitable result when taking in sail in the middle of a sharp squall. The author was very lucky in that he only lost the chronometer when he was in a position to find Bermuda comparatively easily. He carried a radio transmitter, whose battery was ruined on the second day, and a direction-finding (presumably transistor) radio for which he carried no spare batteries. Inevitably, the batteries of this direction-finding radio went flat, and this emergency navigational aid became useless. Even more astonishing, his bucket had no line attached, so that when he dipped it in the sea while the boat was moving the bucket immediately filled with water and was torn from his grasp, and of course sank. It only takes a weekend on a Hal-

versen cruiser to learn that simple fact.

The book, too, has its faults. The interlude at Bermuda is entirely out of place. Some of the descriptions of this episode seem to have been suggested by the kind of editor who would (as “Punch” assures us) ask a historian: “Surely there might have been some orgies, even in Calvin's Geneva?” Misprints also are no help, like that on page 72, where his mileage logged from the start is given as 11,155 instead of 1,155 — such a mistake is inexcusable in this sort of book. Another borer is on page 46, where he speaks of the importance of keeping the south westerly wind on the port quarter, when he means south-easterly. A south-westerly in this situation would have blown him to the north pole.

It should be pointed out that Mr. Howells was very lucky in the weather the whole time. The worst that he suffered was a short squall when he could have been run into a storm lasting five or six days.

The various criticisms I have made, though necessary, should not detract from what is a very well written book, with absorbing descriptions of the ocean, the author's own reactions, and the boat itself, with its ingenious self-steering gear. This is an attractively printed book with a very good set of illustrations, many of them taken by the author. On the back cover the publishers ask the reader to write to them for details of their other books about the sea. I certainly shall.

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"THE WARSHIP IN HISTORY"

Author: Philip Cowburn.

Publisher: MacMillan, London.

Price: \$6.40.

Review by: T. B. Millar (reproduced with authority from The Sydney Morning Herald).

This is a book for the connoisseur or the collector, for everyone who has ocean salt in his blood and is affected by the romance of going down to the sea in ships and doing business in great waters.

Philip Cowburn was for 17 years on the staff of the Humane Studies Department at the Royal Naval College, Greenwich. (He is now in the Department of History at the University of N.S.W.) This volume obviously comes out of that experience and is a labour of love, both by him and by the publisher. It is a production worthy of its subject.

For, over the centuries, men have put into vessels of war great ingenuity and skill, at times also some of their nobility and sense of beauty. Perhaps this is because every ship is a challenge to the elements, and a warship bears the additional task of meeting or meeting out man's hostility to his own kind.

This book is by no means a complete history of warships. Such a task would require a series of volumes. But the author has traced the main stages of the development of the warship from the third millennium B.C. until the present day, illustrating his essays with a large number of excellent reproductions of paintings, carvings, models, engravings and photographs.

The combination of sail and oar as a means of propulsion lasted some 5,000 years or more, and the refinements developed were surprisingly few. For a long time the only difference between a warship and any other ship was the intention of the occupants.

Early developments were the high washboards to protect the

oarsmen, the crow's nest for extra vision, additional banks of oars, a keel and a rudder. For offence, a "beak", often of bronze, was fitted to ram the opposition, and raised platforms from which to shoot arrows or drop weights upon him. The size of vessels, and the shape and positioning of sails, also gradually changed.

Sea fighting at a distance began with catapults, fitted to some of Rome's Byzantine fleet. These could throw half a ton of lead about 750 yards, Mr. Cowburn records, but their accuracy was limited.

Another Roman secret weapon was a form of maritime napalm, called by Gibbon "Greek fire". This was apparently a mixture of liquid bitumen or of naphtha with pitch extracted from coniferous trees. It was blown laterally through long copper tubes placed in the bows and "shaped into the mouths of savage monsters" to add to the terror.

Gunpowder did not come until the fourteenth century, and the first gun was placed on board an English ship, Christopher of the Tower, in 1406. This revolutionised naval tactics, making ships stand off from each other rather than grapple in personal combat. Once guns were in they were in with a vengeance, but in quantity rather than in quality. Henry VIII's best-known warship, Henry Grace a Dieu or Great Harry, a four-master of 1,000 tons, carried 173 guns of 12 different kinds.

Although not carved and gilded as later became fashionable, this ship must have been a gay sight in a good breeze. Mr. Cowburn relates that her mainmast carried

two streamers, one 40 and one 51 yards long, while those on the foremast and the mizzen were 36 and 28 yards, respectively. It had, in addition, 28 banners wrought with gold and silver and with silk fringes, 10 flags of St. George, and seven other buckram banners.

For the next 300 years there was little change in basic ship design. Some of the wooden ships had remarkably long lives. The first Vanguard, built in 1586, lasted 80 years. The Warspite, renamed Edinburgh, had 105 years of service.

The really revolutionary changes came, of course, at the beginning of and during the nineteenth century. Steam replaced sail; breech-loading guns, firing pointed explosive shells from rifled barrels, led to armoured protection and then to almost wholly metal ships; wireless provided inter-communication. The revolving turret brought greater flexibility. The submarine and the torpedo increased offensive capacity, while mines gave all-weather, day and night protection to harbours. In the twentieth century, the aircraft-carrier, radar, nuclear propulsion and the nuclear missile have continued the revolution.

Mr. Cowburn does much more than give a catalogue of ships and their characteristics. He discusses changes in naval strategy and tactics and gives vignettes of great sailors and accounts of some of the great sea battles of history. He writes interestingly, with enough detail for most specialists but not too much for the layman.

Yet, with due respect to him, it is the illustrations that really make the book into a collector's item. Here he has drawn on the immense

resources of London's museums. We see Odysseus' ship passing the Sirens (taken from a Greek wine jar of about the fifth century B.C.); a Viking longship of about A.D. 900; crusading round ships at the conquest of Constantinople in 1203; Maltese and Turkish galleys, Dutch and Elizabethan galleons.

There is Fulton's Demologus, launched in 1814, the first steam warship in the world; and a paint-

ing of a tug-of-war between two British sloops, one with paddle-wheel and the other with a screw propeller, to see which was the more powerful. At full steam for both the screw ship pulled the other ignominiously backward at three miles per hour.

And so on, into the dreadnoughts, the pocket battleships, aircraft-carriers and submarines. The narrative provides the essential

links and details, but the pictures tell the story. One aspect that stands out is the extreme conservatism of naval designers and their masters, their reluctance to innovate and experiment. Yet that conservatism may itself be a tribute to the sea and its power, which cannot be dared too far. As Mr. Cowburn quotes Conrad: "The sea has never been friendly to man. At most it has been the accomplice of human restlessness."

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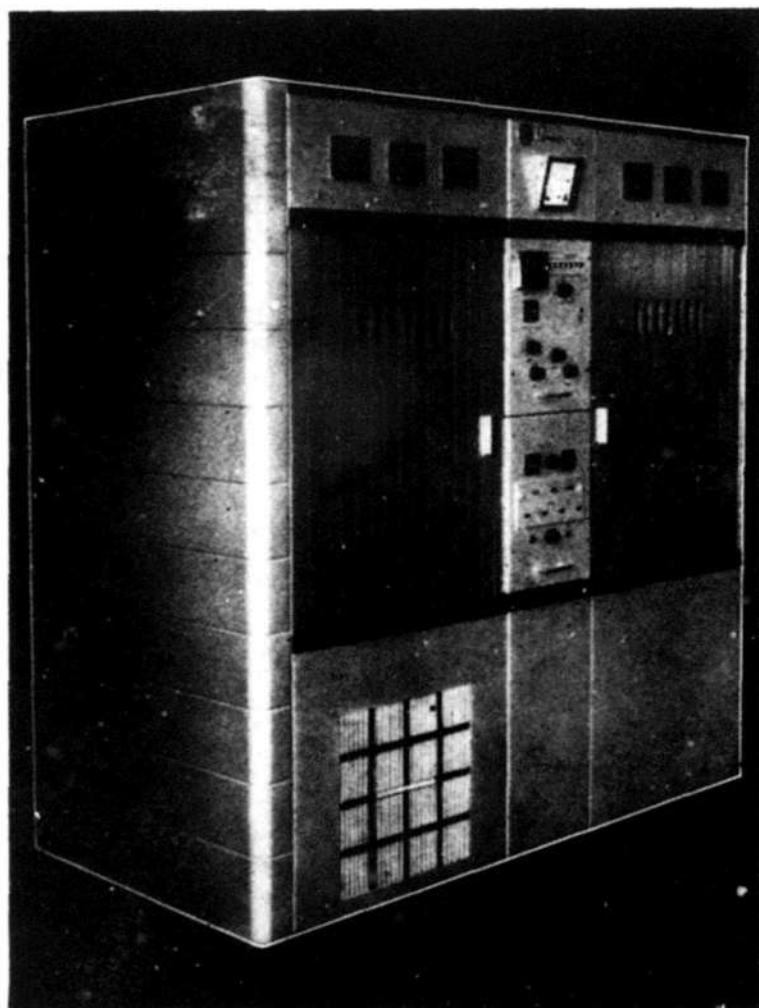
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