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U.S. Defence Secretary Mr. Robert McNamara has ordered a Pentagon study of gunfire support requirements in Vietnam which may involve recommissioning of one or two of America's four 16-inch-gun battleships in the reserve fleet.

An earlier Navy study recommended recommissioning of two more 8-inch gun cruisers to assist inshore bombardments.

According to "New York Times" military writer Hanson Baldwin, the Navy is split on the battleship issue. Previous plans to use battleships have founded on the basis of targets, costs and manpower.

One high-ranking Naval officer is quoted in Washington as describing battleships as "antediluvian monsters out of the dark age of Naval power."

But other officers, notably Vice-Admiral John S. McCain, commander of the Eastern Sea Frontier, have urged recommissioning of battleships for shore bombardment and as Commando-type ships.

According to Hanson Baldwin, "these would be equipped with helicopters, a small Marine landing force and a command and control communications system — a kind of amphibious landing threat compressed into one ship."

"The Marines have solidly supported the relatively few Naval officers who have urged the recommissioning of battleships."

It was not until the White House gave the Navy permission to use its guns against coastal targets in North Vietnam that the arguments for a 16-inch gun, as compared to the 5-inch, 6-inch and 8-inch Naval guns now available, won support at high levels in the Pentagon.

Battleship men are encouraged by Mr. McNamara's action in ordering a review of naval gunfire requirements.

Many navy officers say privately that the Navy went too far too fast in converting its gunned ships to missiles, and that Vietnam demonstrated conclusively that more guns were needed in a balanced fleet.

However, the yardsticks against which the utility of the battleship will be judged are its targets.

Gunfire can be directed against map targets or fixed grid co-ordinates, such as crossroads and bridges, or against coastal targets that can be "seen" by radar without the need of spotting aircraft.

The U.S. has retained four battleships of the Iowa class of World War II in its reserve fleet, each with nine 16-inch guns.

The "Louisiana" is laid up in Bremerton Navy Yard on the Pacific coast: the Iowa, Wisconsin and New Jersey are in the Philadelphia Navy Yard.

Navy sources say there is an ample supply of 16-inch, high capacity, 2,400 pound shells in storage. The powder, which is old, would have to be reworked, but at slight cost.

Recommissioned battleships would have to be furnished with new electronic equipment and thoroughly overhauled. The cost for each ship is estimated at between $1 million to $25 million.

They would require crews, if fully manned, of about 3,500 men, but suggestions to secure one boiler room and to leave undermanned some second-fury battery guns are under study.

Some experts believe that the ships could be operated safely with as few as 1,100 men each.

The time required to take battleships or cruisers out of mothballs, to modernise them and to assemble and train their crews would be measured in months, doubtless more for a battleship than a cruiser.

According to the "New York Times" expert, nine to 16 months might expire before a battleship could be in action off Vietnam after recommissioning started.

Because of this time element, the Navy is pressuring the Pentagon high-ups for a quick decision.
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THIRD NAVAL MEMBER RETIRES

Rear Admiral Frank Leveson George, C.B.E., 57, who has been Third Naval Member of the Naval Board and Chief of Naval Technical Services since February, 1963, retired on 14th March.

Admiral George was succeeded by Captain Frederick William Purves, O.B.E., who has been promoted to Rear Admiral.

Since graduating from the Naval College at Jervis Bay in 1924, Admiral George has specialised in engineering and has held many of the Navy's senior engineering posts, including that of General Manager of Garden Island Dockyard, Sydney. He was the first Captain of the R.A.N.'s Training Establishment, H.M.A.S. "Nirimba", and, with the rank of Commodore, the first Engineer officer to command H.M.A.S. "Cerberus".

During the Second World War he served in the Mediterranean and Pacific.

Admiral Purves, like Admiral George, has specialised in engineering since joining the R.A.N.R. (Seapoint Branch) as a Lieutenant in 1940. He was granted a permanent commission in 1946 with the rank of Lieutenant Commander.

Prior to his appointment as Third Naval Member, Admiral Purves had been in England for two years on the staff of the Australian Naval Representative as Chief Staff Officer (Technical).

UNITED STATES NATIONAL WAR COLLEGE

A party from the U.S. National War College visited Australia during April in the course of a tour of the Far East.

The group comprising 34 students (senior officers from the U.S. Departments of State, Navy, Army and Air Force) and members of the faculty staff was led by Colonel Stuart M. Porter. The National War College was established in 1946 and is controlled by the American Joint Chiefs of Staff. It prepares selected members of the Department of Defence, the State Department and other agencies of the Federal Government to exercise high level policy, command staff functions. Other groups from the College are currently visiting countries in Europe, the Middle East, Africa and Latin America. These visits are an integral part of the College curriculum and permit firsthand observation by the students of conditions in various parts of the world in preparation for their future duties.

FLAGSHIP TO DELIVER NEW AIRCRAFT

The aircraft carrier H.M.A.S. "Melbourne" (see photo) will sail to the United States about October/November to take delivery of fourteen S-2E Tracker aircraft, eight A-4G Skyhawks and two, two-seat TA-4G Skyhawk trainers, together with ground equipment and training aids for use at H.M.A.S. "Albatross", the Naval Air Station at Nowra, N.S.W.

"Melbourne" will sail to the U.S. after service in South-East Asian waters, attached to the British Commonwealth Strategic Reserve.

JOINT AUSTRALIAN/U.S. DEFENCE REVIEW

The second annual review of Cooperative Logistics between the Australian and American Governments, was held at the Department of Defence, Canberra, from April 26 to May 4.

In addition to reviewing planned procurement of weapons from the U.S., the representatives also discussed the feasibility of Australian production of supplies and equipment for U.S. military forces in South-East Asia.

A Logistics Arrangement, first agreed to in February, 1965, between the two Governments, was...
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The Collins Trophy donated to the R.A.N. by the Fairey Aviation Company for annual competition between Squadrons of the Fleet Air Arm was won last year by 723 Squadron.

The Squadron which is stationed at H.M.A.S. Albatross, has the responsibility of training helicopter pilots and is also involved in search and rescue duties (see photo). The men of 723 Squadron played a prominent part in the search for survivors from the dredge "W. D. Atlas" during May last year, rescuing four men from the sea.


H.M.A.S. "PERTH", the first of Australia's Guided Missile Destroyers purchased from the United States.

VISIT BY TUNKU GENERAL OSMAN

The Chief of the Malaysian Armed Forces Staff, General Tunku Osman bin Tunku Mohamed Jewa, P.M.N., visited Australia during May.

While in Australia he exchanged views on matters of mutual interest with the Chiefs of Staff Committee and others and undertook a programme of visits to Service establishments in three States where he saw at first hand the training being undertaken by the Malaysian Services personnel in Australia under the Malaysian Aid Programme.

ARMED SERVICES STATISTICS

A statement released on May 1 gave details of recruiting for the Armed Services for February and March of this year.

Actual strengths at March 31 were: Navy 15,795; Army 39,187 (25,291 regulars and 13,896 National Servicemen); Air Force 20,064.

COLLINS TROPHY—1966

The Collins Trophy donated to the R.A.N. by the Fairey Aviation Company for annual competition between Squadrons of the Fleet Air Arm was won last year by 723 Squadron.

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A Westland Wessex H.C.2 helicopter of the type flown by the winning squadron.
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H.M.A.S. BOONAROO
"Boonaroo" was commissioned as an R.A.N. ship on March 1 and has since carried a cargo of munitions and other supplies for the Australian forces in South Vietnam.
H.M.A.S. "Boonaroo" decommissioned from the Royal Australian Navy at an informal ceremony held on Monday, May 8, 1967, was handed back to her civilian owners, the Australian National Line.

H.M.A.S. OXLEY COMMISSIONED
At the yards of Scotts' Shipbuilding and Engineering Company, Greenock, Scotland, on March 21, H.M.A.S. "Oxley", first of four Oberon Class submarines for the R.A.N. was commissioned.

The commissioning of "Oxley" marked the re-introduction of a submarine force into the R.A.N. for the first time in 35 years. "Oxley" was launched (see photo) on September 24, 1965, by Lady Downer, wife of the Australian High Commissioner in Britain. The second of the class "Otway" was launched by Princess Marina in November, 1966. "Ovens" is expected to be launched early in 1967 and "Onslow" about a year later.

H.M.A.S. OXLEY at her launching. She is now a commissioned vessel in the R.A.N.

TECHNICAL CO-OPERATION PROGRAMME
The ninth annual meeting of representatives of the U.S., U.K., Canada and Australia on the Technical Co-Operation Programme took place at Canberra on May 15.

The mission of the Programme is to further defence research and development among the four countries, to avoid duplication of effort and to provide economies in the use of scientific resources of the member countries as well as to afford mutual assistance through collaboration among scientists engaged in selected fields of research.

VISIT BY NEW ZEALAND ADMIRAL
The Royal New Zealand Navy's Chief of Naval Staff, Rear Admiral John O'Connor Ross, C.B., C.B.E., visited Canberra last March.
While at Canberra he held discussions with the Australian Naval Board, the Chairman of the Chiefs of Staff Committee and the Secretary, Department of Defence. He also visited the R.A.N. College at Jervis Bay to see the New Zealand Cadet Midshipmen in training. Finally on March 14, Admiral O'Connor Ross held discussions with the Flag Officer in Charge, East Australia Area. Rear Admiral T. K. Morrison. C.B., C.B.E., D.S.C.

UNITED STATES ARMED FORCES STAFF COLLEGE
Three officers, one from each Service, have been selected to attend the 42nd course at the United States Armed Forces Staff College at Norfolk, Virginia.
The officers selected are Commander J. G. Sommerville, R.A.N., Lieutenant Colonel K. P. Outridge, Army and Wing Commander H. J. Hurley, R.A.A.F.

AUSTRALIAN TECHNICAL MISSION TO MALAYSIA
An Australian Technical Mission visited Malaysia from May 22-June 15 for discussions on defence aid.

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Commenting on the object of the course, the Honourable Allen Fairhall, M.P., Minister for Defence, said that it was in the best interests of both the Government and the industrialists to keep abreast of developments in industry and defence. Planning necessary to meet equipment needs of the forces could then be undertaken.

A model of the Patrol Craft recently launched from Queensland yards for the R.A.N.

was agreed that the current defence aid programme would be extended until the end of 1970, the termination date for Malaysia's present expansion programme.

The current programme covers the provision of training courses in Australia for Malaysian Servicemen, the secondment of Australian Servicemen to the Malaysian Armed Forces and a wide range of military equipment.

In addition to discussions with the Malaysian Ministry of Defence and Royal Malaysian Police authorities, the members visited Service installations, ammunition depots and dockyards to obtain as complete a picture as possible of Malaysia's defence and internal security requirements.

The problems associated with industrial support for the Defence effort were discussed by more than 100 representatives of industry, the armed forces and State and Commonwealth Departments at an Industrial Mobilisation Refresher Course in Sydney on May 10 and 11.

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H.M.A.S. "Hobart" for service with the U.S. Seventh Fleet in Vietnamese waters in mid-September.

AUSTRALIAN SHIPS VISIT JAPAN

Flagship of the Royal Australian Navy, the aircraft carrier, H.M.A.S. "Melbourne", the fleet tanker H.M.A.S. "Supply" (see photo on previous page) and the destroyer escort H.M.A.S. "Derwent" made goodwill visits to Japan during May-June.

"Melbourne", currently serving with the British Commonwealth Strategic Reserve called at Yokohama from May 25-29 and Kure from May 31-June 3.

"Supply" was in Yokosuka from May 25-June 2, and "Derwent" visited Tokyo, May 25-27, Hiroshima, May 29-31, and Sasebo from June 1-3.

RECORD CHART SALES

Sales of Royal Australian Navy charts reached the record number of 24,118 in 1966.

Nineteen new charts were published last year, including Mackay, Cairns, Whitsunday Passage, Groote Eylandt, Port Hedland and Dampier and a yachting chart of the approaches to Port Jackson.

There are 34 new charts scheduled to be produced this year, covering the entire coast of Tasmania, approaches to Melbourne and Fremantle, Queensland and North-western Western Australia.

OUR COVER

Rear Admiral T. K. Morrison, C.B., C.B.E., D.S.C., Flag Officer in Charge, East Australia Area, inspecting members of the guard at the annual Church Parade of the New South Wales Division of the Australian Sea Cadet Corps, Garden Island, Sydney (see story under heading "Sea Cadet Corps News").

— R.A.N. Official Photograph.
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BOOK REVIEW —
"From the Dreadnought to Scapa Flow"

Author: Arthur J. Marder, Professor of History, The University of California, Irvine.


In a number of years it has become easier to study the First World War. A generation ago, much information was available but it was rather incomplete and sometimes of official origin. Professor Marder's history of the Royal Navy in the Fisher era is an important contribution. It is well researched, full of detail and contains many useful quotations from letters and diaries. The book is a valuable source for students of naval history.

The Royal Navy in the Fisher era is divided into three volumes. The first two volumes cover the period from 1904 to 1916, and the third volume covers the period from 1916 to 1919. The book is well structured and easy to read. Each chapter is divided into sections, each of which is devoted to a particular subject. The book is well illustrated with maps and charts.

Professor Marder's history of the Royal Navy in the Fisher era is a valuable addition to the study of naval history. It is well researched, full of detail and contains many useful quotations from letters and diaries. The book is a valuable source for students of naval history.
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JAPAN'S MARITIME SELF-DEFENCE FORCE (MSDF)
A survey compiled from information supplied by the Maritime Staff, Japanese Defence Agency and other sources. All photographs produced are official. The Editor expresses his appreciation for the assistance and co-operation rendered by Chihiro Katsuta, a Consul in the Consulate-General of Japan.

More than 2,000 years of victory had come to an end when the Emperor of Japan called upon the Supreme Commander of the Allied Powers in 1945. With the end of the War, Japan was thrown into confusion. A Navy which had once been the pride of the nation was forgotten as were all other things military. But, by the end of a decade the new Japan was a stable reality.

THE MISSION OF THE SELF-DEFENCE FORCES
Japan has no navy, army or air force but she does have Maritime, Ground and Air Self-Defence Forces whose basic mission, organisation, equipment and training are generally the same as those of the military forces of other nations. The primary mission of the three Self-Defence Forces, as defined by the Self-Defence Forces Law “... is to defend our country against direct and indirect aggression for the purpose of preserving peace and the independence of our country, and to maintain the national security and when necessary, take charge of maintaining public order.”

When Japan was occupied by the Allied Powers in 1945, she was totally disarmed. All regular officers of the armed forces were demobilised as were members of parliament, businessmen and industrialists. However, in 1952, as the Korean War continued, General Douglas MacArthur, Supreme Commander Allied Powers, authorised the formation of a Maritime Safety Force, the forerunner of the Maritime Self-Defence Force and on 12th November of the same year Japan concluded an Agreement with the United States for the loan of Naval vessels.

Mutual Defence Assistance Agreement and Establishment of the Maritime Self-Defence Force
During the first half of 1954 the Mutual Defence Assistance Agreement was signed by Japan and the United States of America. Also further agreements for the loan of U.S. Naval vessels were concluded whereby eight destroyers, one submarine and aircraft together with ammunition, were supplied. Thus Japan, like Spain, Iran, South Korea and Taiwan is now classified as a U.S. Bilateral Treaty Power.

On 1st July, 1954 the Coastal Safety Force became the Maritime Self-Defence Force (MSDF). The same year saw the formation of the Ground Self-Defence Force (GSDF) and the Air Self-Defence Force (ASDF).

Together with the establishment of the Joint Staff Council and with the increase of civilian staffs, the Self-Defence Forces (SDF) were formed and the Japan Defence Agency (JDA) was established as the overall administrative body.

Two distinct features of the total defence establishment are the Defence Agency and Defence Academy. Except for the defence capability plan and the operating plan of the Joint Staff Council and the three Services, all major defence plans are formulated within the defence Bureau of the Defence Agency without the direct participation of uniformed personnel and it should be made clear that there appears to be no objection to the
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Defence organisations being administered by civilians.

Defence Academy
The Japanese are one of the first powers to fully realise the feasibility, importance and advantage of three-force co-operation, viz: a single combined force to play the major role in any future war, thus the Defence Academy is a combined naval, military and air college where a total of 330 cadets (current figure) are admitted annually.

The first year of the four year course provides a common curriculum for all cadets regardless of service interest, but from the second year 100 are assigned as officer candidates for the MSDF, 300 for the GSDF and 130 for the ASDF. From this time on cadets receive a specialised education in the service to which they have been assigned.

Unique Features of the Japanese Self Defence Forces
There are five very interesting and distinct facets peculiar to the Forces, namely:

(1) No person serving in the Forces can be court martialed; instead, a defendant is brought before a civil court and may choose his own counsel who in turn has access to any classified information regardless of his security rating.

(2) Censorship is prohibited — freedom of expression in any form is permitted and guaranteed by the Constitution.

(3) All members must be volunteers; conscription is not permitted, neither are Reserve forces except for 19,000 in the GSDF Reserve. When a man leaves the Service his obligations also cease, he retains neither rank nor uniform and even in a national emergency no former member of the forces is obligated to re-enlist.

(4) The terms of the Constitution prohibit the sending of any Self-Defence Force unit abroad for defence purposes.

(5) The Emperor holds no rank in the forces, nor does he wear Service uniform, and to date, has never visited a Self-Defence Force Unit.

The MSDF Today
There are at present more than 35,180 officers and ratings in the MSDF and some 4,980 civilian personnel. Japan's total Defence Estimates for 1966/67 were 340,635,000,000 Yen, equal to $946,000,000; which figure is 1.3% of the Gross National Product and 8.2% of total government expenditure. There are approximately 205 ships and 240 aircraft attached to the MSDF.

Present Strength
Destroyers, Total: 22.
(a) Antisubmarine type of the improved "Moon" class. Takatsuki—DD164 (Photograph) is the first of four of this class to be completed, one sister ship will be named Mochizuki—DD165 and the remaining two to be listed as DDA's are as yet unnamed. Ships of this class have combined masts and stacks. Displacing 3,000 tons and having a length of 426.5 feet and a beam of 44.5 feet, vessels of this class mount two, 5 inch dual purpose guns in single mounts. Anti-submarine equipment comprises octuple ASROC; a DASH helicopter; one, four-barrelled rocket launcher and two, triple homing-torpedo launchers. Two Foster-Wheeler boilers together with geared turbines turning two shafts, develop 60,000 B.H.P. equal to 32 knots.
MAKIGUMO, a recently constructed Destroyer, is equipped with Octuple Asroc.

(b) Diesel type of the “Cloud” class.

Of a total of seven to be constructed, the Yamagumo—DD113 and Makigumo—DD114 (photograph) have been completed, the third vessel has as yet only been named, Murakumo—DD115: the naming of four of this class will be built under the five year defence plan—1962 to 1966.

Vessels of the “Cloud” class are fitted with a lattice mast and two funnels. Their official displacement figure is 2,050 tons; dimensions: 347 feet in length with a beam of 38.5 feet. Weapons include four, 3 inch anti-aircraft guns in two twin mounts: Octuple (viz: eight) ASROC; one, four-barrelled rocket launcher; two, triple homing torpedo launchers. Power is provided by Mitsubishi B & W diesels turning two shafts and developing 26,500 B.H.P. equalling 27 knots. Complement—215 officers and men.

AMATSUKAZE (photograph) DDI63 was laid down on 29th November, 1962, launched 5th October, 1963 and completed 15th February, 1965: a creditable feat for a prototype of the size and complexity of this vessel. Displacing 3,050 tons standard and 4,000 tons full load, she is the largest naval vessel completed in Japan since the end of World War II and the first to be armed with a guided missile launcher. She is distinguished by very clean lines, with flush deck and a marked absence of superstructure.

This ship has an overall length of 429 feet and beam of 44 feet and is fitted with the radar guided, surface-to-air guided missile, “Tartar”, in one single launcher.

This destroyer is equipped with four, 3 inch anti-aircraft guns in two twin mounts: her anti-submarine weapons comprising one set of Short Torpedo Dropping Gear on each side and two Hedgehogs. Ship’s complement is 290 officers and ratings. Two Ishikawajima Foster-Wheeler boilers and geared turbines turning two shafts and developing 60,000 shaft horsepower provide a speed of 33 knots.

Amatsukaze is designed to carry a helicopter and it is understood she is shortly to have ASROC fitted amidships.

(c) Guided Missile Armed Type—one only.

Amatsukaze (photograph) DDI63 was laid down on 29th November, 1962, launched 5th October, 1963 and completed 15th February, 1965: a creditable feat for a prototype of the size and complexity of this vessel. Displacing 3,050 tons standard and 4,000 tons full load, she is the largest naval vessel completed in Japan since the end of World War II and the first to be armed with a guided missile launcher. She is distinguished by very clean lines, with flush deck and a marked absence of superstructure.

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Amatsukaze is designed to carry a helicopter and it is understood she is shortly to have ASROC fitted amidships.

(d) Two, “Moon” class—Akizuki—DD151 (photograph) and Teruzuki—DD162.

Destroyers of a new design having a long forecastle hull these vessels were built in Japan under an Off-Shore Procurement Agreement. They serve as Flotilla leaders and senior officers’ ships. Akizuki visited Sydney and Melbourne during August last year with the MSDF training squadron.

Having an overall length of 387 feet and a beam of 39 feet, vessels of the “Moon” class are fitted with three, 5 inch dual-purpose guns in single turrets and four, 3 inch anti-aircraft guns in two twin mounts:

They are equipped with four, 21 inch (quadrupled) torpedo tubes and anti-submarine weapons include two Hedgehogs, two Y-guns, one U.S. model Mk 108 rocket launcher
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and two depth charge throwers. These destroyers are also equipped with two homing-torpedo launchers, two radar systems and two sonar installations.

Shacht horsepower is 45,000 equal to 32 knots. Ships’ complement is 330 officers and men.

(c) Seven Tshi-Submarine (“A” Type DDK)—“Wave” class: Akanami, Isosanai, Shikinami, Takanami, Uranami, Oonami (photograph) and Makinami.

All vessels of this class were completed during the period 1938/1960 under the First Defence Build-up Programme and are reported to be very successful ships.

Displacing 2,500 tons, full load, vessels of this class measure 357 2/3rd feet at the waterline and are 35 feet in beam. Armament consists of six, 3 inch anti-aircraft guns in three twin turrets; four, 21 inch (quadrupled) torpedo tubes (four torpedo loading racks are mounted in pairs abreast the after funnel); four fixed anti-submarine homing torpedo launchers mounted on the quarter deck; two U.S. model Mk 15 hedgehog type depth charge throwers mounted on turntables before the bridge, and two 3-guns.

Machinery consists of two Mitsubishi-Nagasaki CE type boilers supplying high-pressure superheated steam to two sets of Mitsubishi-Fischer-Weiss geared turbines turning two shafts and developing 35,000 shaft horsepower, equal to a speed of 32 knots. These destroyers carry 229 officers and men.

(d) Other older destroyers include three anti-aircraft (“A” Type DDA) of the “Rain” class, Harusanai, Mutenai and Yudachi; two of the “Wind” class Harukanai and Yukikaze. Classed as high speed escort vessels, they were modelled after the Shiratsuyu of the Imperial Japanese Navy and “Gearing” class destroyer of the U.S. Navy; two “Twilight” class being ex-U.S. vessels of the late “Fletcher” type—Arlake and Yuiguroe were modernised in 1962; finally, two “Breeze” class being ex-U.S. vessels of the “Gleaves-Livermore” Type. Frigates and/or Destroyer Escorts, Total—18.

Fourteen of the vessels in this classification were completed before 1956. Japan’s latest vessels are four of the “River” class. Isuzu and Mogami were completed in 1961 whilst Kinkamai (photograph) and Ois were completed in 1964 and have a number of improvements in armament and other equipment and are reported to be of slightly different dimensions.

Destroyer Escorts of this class displace 1,490 tons standard and 1,700 tons full load, having an overall length of 308 feet and beam of 34 feet.

Four. 3 inch guns in twin mounts; four, 21 inch (quadrupled) torpedo tubes; one, four barrelled rocket launcher; two, triple homing torpedo launchers; one depth charge thrower and one depth charge rack comprise their armament.

Machinery consists of four diesels. Two shafts. Brake horsepower: 16,000 equal to 25 knots. These airconditioned vessels carry a crew of 180.

Completed in 1965, OOSHI is the 9th of the vessels of this type.

Submarines. Total—6
(Four yet to be built under the Five-year Defence Plan. 1962-1966)

(a) Of the two boats of the “Oshio” class, “Asashio”, SS562 and “Oshio”, SS561 (photograph), the latter is the only boat yet completed. Of a large design these boats are being constructed to obtain improved seaworthiness, increase torpedo carrying capacity, be fitted with more comprehensive sonar and electronic devices and be capable of diving to a considerable depth.

Standard displacement is 1,600 tons, the dimensions being 278 x 27 x 151 feet. Six bow and two stern. 21 inch torpedo tubes are fitted.

Designed surface speed is 14 knots, submerged speed 16 knots, power being derived from two sets of Kawasaki MAN diesels or two electric motors.

(b) “Hayashio” class. Total—4.
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A drawing of Japan's new training ship—her keel was laid during March, 1967

Details of the training ship (photograph) are as follows:
Her keel was laid during March this year and she is scheduled for completion in 1969. Overall length to be 415 feet with a beam of 49 feet (approx. figures). Armament to comprise four, 3 inch rapid fire guns in twin mounts, a rocket launcher and two sets of three torpedo tubes mounted abreast the funnel. This vessel will be provided with a helicopter landing platform. Design speed is 25 knots (approx.). Ship's complement will be 460 officers and men.

Third Defence Build-up Programme
This programme was finalised by the National Defence Council in March, 1967, whose objective is to promote home production of equipment to support the build-up attained by the Second Programme (1962-1966).

The Defence Council has agreed to build 60 Self-Defence ships having a total tonnage of approximately 53,000, including 14 destroyer escorts and 5 submarines, with the objective of maintaining 207 ships (total tonnage approx. 142,000) by the end of 1971. The Council hopes to have 196 Supporting ships in commission by the end of 1971—total tonnage approximately 21,550. Besides maintaining 60 fixed wing aircraft for anti-submarine search, 33 helicopters and 28 training planes the Council intend having 218 operational aircraft by the end of 1971.

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Aircraft in Service with the JMSDF

The Naval air component currently comprises Trackers, Neptunes and anti-submarine warfare helicopters. Other lesser known types include: Eight HSS-2s, American designed anti-submarine warfare helicopters; variants of the Sikorsky S-61B-1 (SH-3A Sea King), see photograph.

One H-65, a light executive transport seating 4 to 5 passengers. It is a non-pressurised version of the U.S. built Beech 55 King Air.

One NAMC YS-11M, a short-medium haul commercial transport. One, S-62, Sikorsky General Purpose Transport helicopter already operated by the ASDF.

An unknown number of medium assault transport helicopters known as V-107 (Boeing-Vertol CH-46A Sea Knight). Their principal tasks will include anti-submarine functions, mine-sweeping, reconnaissance, rescue and transport duties (see photograph).

Development of A.S.W. systems has lagged behind that of the vessel that they are intended to counter, and considerable effort is being expended in the West (and presumably in the Soviet Union also) to close the gap and nullify the threat posed by the nuclear underwater vessel that can lay submerged at great depths and undetected until it launches its missiles and then moves stealthily away. It would be idle to suggest that the necessary breakthrough in the development of A.S.W. systems has yet been made, but the vehicles that will carry such systems when they become available are already taking form, and the Japanese have had two new maritime patrol aircraft under development for some considerable time: The shore-based PX-L, and the waterborne PX-5.

**NEPTUNE DERIVATIVE**
The PX-L, which recently commenced its test programme, is a derivative of the Lockheed P-2H Neptune evolved by the Japanese Neptune licencee, Kawasaki. Although widely considered to be too small to carry adequately comprehensive A.S.W. gear, an updated Neptune is attractive to the Japanese on the score of cost, for the existing jigs and tools on which Kawasaki has manufactured 48 P-2H Neptunes can also be used for its proposed successor, known to Kawasaki as the GK-210 and to the Japanese Maritime Self-Defence Force as the P2V-Kai. Apart from inadequate internal capacity, the existing Neptune is somewhat short on range and speed, and lacks the crew comfort demanded if peak efficiency is to be maintained over long-duration patrols. Kawasaki's only concession to increasing internal capacity has been the insertion of a 45-in section in the fuselage between the wing leading edge and the flight deck, but it has an additional crew member to be carried by the P2V-Kai (a tactical co-ordinator), the problem of providing sufficient space to accommodate new A.S.W. systems as they are developed. The PX-L will include anti-submarine functions, mine-sweeping, reconnaissance, rescue and transport duties.

The PX-L has a new search radar, the Westinghouse J-3-JH-7C turboprop, and the waterborne PX-5 is equipped with the Thomson-CSF Atlas 5400. Kawasaki has manufactured 48 P-2H Neptunes and the PX-L is intended to replace the P2V-Kai. The Japanese have had two new maritime patrol aircraft under development for some considerable time: The shore-based PX-L, and the waterborne PX-5. **JAPAN'S MINESWEEPING HELICOPTER, THE V-107**

Japan's new Anti-Submarine Patrol Aircraft PX-L

**THE NAVY**

May-June, 1967

Catholic Protection Unit

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Aircraft in Service with the JMSDF

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The PX-L, Japan's new Anti-Submarine Patrol Aircraft PX-L

**THE NAVY**

May-June, 1967
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A model of the Shin Meiwa PX-S four-turboprop flying-boat being developed for anti-submarine and patrol duties for the Japanese Navy. Weighing 40 tons, it is expected to fly this year. Preliminary research has been done, using a converted Grumman Albatross.

and are now of twin-wheel type, and the vertical tail surface area has been increased by a foot extension of the tip chord. By comparison with the P-2H, empty weight of the P2V-Kai has been reduced by some 10,000 lb. gross take-off weight being 8,000 lb lower.

Current plans call for the acquisition of 48 P2V-Kai maritime patrol aircraft by the JMSDF.

THE PX-S FLYING BOAT

Apart from the Soviet Union only Japan appears to retain any interest in the flying boat for the maritime patrol task, although the U.S. Navy has apparently thought twice about phasing out the Martin SP-5B twin flying boats that still equip three patrol squadrons, and is initiating a retrofit programme in which a single General Electric J85-GE-2 turbojet is mounted in the rear of the hull to reduce take-off time and distance at the high gross weights that the Martin now operates with its ever-increasing load of ASW gear. In Japan, the PX-S programme for a new patrol flying boat will bear fruit with the completion of the first prototype flying boat built to meet the requirements of the JMSDF's specification. Flight trials will not begin until August (refer page II, Aug.-Sept., 1966, edition). Like the P2V-Kai, the PX-S has 2,800 shp Th41H-10 turboprops, and boundary layer control (BLC) is utilised for high lift, this being supplemented by an airscup slipstream deflection system and it is claimed that the high length-to-beam ratio will endow the PX-S with outstanding seaworthiness, a groove-type spray suppressor evolved by Dr. S. Kikuhara aiding operating in rough seas. With empty and normal gross weights of 50,700 lb. and 72,750 lb. and an overload gross weight of 88,200 lb. the PX-S has an estimated maximum speed of 345 mph, a cruising speed of 230 mph, and normal maximum ranges of 2,300 miles. Offensive stores are to be housed in underwing pods between the engine nacelles, each pod housing two homing torpedoes or depth bombs.

The second PX-S prototype is expected to be completed in March, 1968, and if flight trials are successful, it is anticipated that 22 flying boats of this type will be delivered to the JMSDF between 1971 and 1973.

Anti-submarine fixed-wing aircraft currently in service with the JMSDF is the P2V-7, which, like its successor, the P-2J, belongs to the "Neptune" family (see photograph). The P-2J is still in process of development, however, major modifications include the installation of home-manufactured turbo-prop engines and the enlargement of the airframe thus providing increased anti-submarine patrol capabilities.

Conclusion.

The relatively orderly advance of all Self-Defence Forces is due to the support rendered by the United States — support in the form of weapons, vehicles, ships, aircraft, communications equipment and other aid. At the same time, the knowledge gained in the use of that equipment has developed Japan's operational and technical ability to overcome and supplement her deficiencies.

In the wider sense, it is essential that Japan, in its vital strategic and tactical position in the world, develop long-range, co-ordinated defence programmes of her own so that she is in a position to counterbalance the changing developments in the Far East and other areas as problems arise.
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Nautical Notes from All Compass Points

By SONAR

CANADA
NEW A.D.A. SYSTEM

Britain has her Action Data Automation system, but America has her Naval Tactical Data System and now Canada is to have a system called Command and Control System 280. All three are highly sophisticated methods of collecting all the information obtained by the various sensors, such as radar, sonar, reports from other ships and so on, and then analysing these reports and displaying them to the Command.

The Canadian system is being developed by Litton Industries of the U.S.A. and will be the first of such equipments to be largely micro-electronic. The heart of the system will be a 1340F computer, which is the latest version of the Litton 300 series of computers and there will be a number of newly developed modular displays consoles.

The system is intended principally for anti-submarine work and will be fitted in Canada's helicopter destroyers now under construction.

SEA SPARROW

The Canadian Navy is to develop Sea Sparrow, the U.S. close-range surface-to-air missile system, for her four new helicopter destroyers now building and two new operational support ships. The system will use the Sparrow III missile coupled with a Dutch fire-control system and a Canadian launcher.

ANTISUBMARINE EXERCISE

A combined U.S. and Canadian antisubmarine exercise took place in the Caribbean from January to the end of March with ships operating out of Roosevelt Roads naval station, Puerto Rico.

Canadian ships taking part included the mobile repair ship, Cape Scott, helicopter destroyers Saguenay, Annapolis, Skenea, Assiniboine, Maritime and Ottawa, the destroyer escort Kootenay, Resolute, Mackenzie and Saskatchewan. Argus maritime aircraft, navy Tracker aircraft, Sea King and Sikorsky helicopters were also involved. The naval aircraft operating from Shearwater Naval Air Station, Nova Scotia, also is very similar to its surface-to-surface SS.12 version and has the same warhead. It, too, is in service with several types of aircraft and helicopters.

In the same trial period at Toulon, two navalised SS.12's were fired from the coastal patrol boat "La Combattante" at a moving target over 6,000 yds. distance. Both hit the 12 ft. x 16 ft. target within a yard of its centre and about one yard above the waterline. According to the manufacturer, the missile's high accuracy is as much due to a special optical sight as the missile's inherent flight accuracy. Developed by the Puteaux Arsenal (a branch of the Technical Direction of Land Armaments), this sight was originally designed for helicopter use, but is being adapted to other vehicles. It has a high degree of magnification and is completely gyro-stabilised to compensate for ship movements.

During recent trials at Toulon, the lightweight launcher can accommodate two SS.12 or four SS.11 missiles. Optical sighting, guidance and control facilities are self-contained.

The versatility of the Nord Aviation family of tactical missiles is evident in many successful variations of the basic type. The SS.11, originally developed as an anti-tank weapon, has since been used in an AS.11 version in an air-to-surface role; it is also basic armament on military helicopters. The AS.12
FIRST ATOMIC SUBMARINE

The French Navy launched its first nuclear-powered "Polaris-type" submarine, the Q122 Redoubtable, at Cherbourg on March 29. France has already ordered three of this French-developed type, described as SNLE (Sousmarin Nucleaire Lance Mines) and may increase the order to five. They are due to enter service in the 1970-74 period. With a length of 420 ft. and a beam of 34.76 ft., they have a displacement of 7900 tons (surface) and 9600 tons submerged, and will be armed with 16 MSBS (underwater-fired sea to shore ballistic strategic) nuclear missiles, and four torpedo tubes. MSBS missiles, already tested aboard the 3800 tons Gymnote (for article "French Submarine Effort" below) experimental submarine, have a 10-ton thrust (P10) first stage and a four-ton thrust (P4) second stage, both solid propellant. They can be launched from a depth of 60 ft., using compressed air, with aiming and firing after they break surface, and have a range between 1250 and 1900nm. Size problems now limit them to 200 kiloton doped nuclear warheads, but they will eventually have megaton thermo-nuclear warheads when miniaturisation problems imposed by SNLE capacity are overcome. Powered by a PWR type atomic reactor, developed by the Cadarache Nuclear Research Centre, and delivering 20,000 h.p., they will have a submerged speed of more than 0.5 knots, and an endurance, without fuelling, of three years. Cruise endurance capability submerged is stated as 90 days, but in practice will be about three days.

FRENCH SUBMARINE EFFORT

It looks as if, following the United States and British lead, France is to stop building conventionally powered submarines and concentrate in future on nuclear power.

The latest project is "Rubic", a nuclear-powered fleet submarine of 3800 tons with a length of 275 2-3 ft. and a beam of 341 ft., of a new hunter-killer type with high performance. This is evidently the prototype for the French submarine fleet of the future.

For the construction of this vessel, and for the construction of France's first nuclear-powered ballistic-missile-armed submarine, "Redoubtable", experience was undoubtedly gained with the building of Gymnote, completed at Cherbourg last year.

"Gymnote" was specifically designed as an experimental platform for testing fleet ballistic missiles designed for "Redoubtable", prototype of the Force de Frappe of three, or possibly five, such vessels. The French Navy hopes to have in the 1970s.

She was also intended for use as an underwater laboratory to prove trial equipment and arms for nuclear-powered submarines. With a displacement of 3800 tons, a length of 275 ft. and a beam of 34ft. She is quite unlike any other submarine in appearance, her two prominent features being her high missile-section shaft the conning tower fin or "sail" and the sonar dome forward. The missile section, housing four vertical tubes for Polaris-type fleet ballistic missiles extends upwards a deck higher than the normal upper deck. She is conventionally powered with diesels and electric motors, her 2600 brake horsepower and two shafts giving her a speed of 11 knots on the surface and 10 knots submerged.

"Redoubtable" is reputed to be designed for a displacement of 7900 tons on the surface and 9000 tons submerged with a length of 420 ft. and a beam of 341ft. She will be armed with 16 Polaris tubes and four torpedo tubes and will have a speed of 20 knots on the surface and 25 knots submerged.

DOLPHIN MATELOTS

The French Navy has recruited a number of dolphins. They are to be trained to respond to commands underwater and the French hope that it might eventually be possible to use them to tow frogmen and for other experimental underwater work.

The French are showing considerably more interest in the ocean depths than we are and are now spending almost as much money on oceanography as are Russia and the U.S.A.

British oceanographers fully realise the importance of extending their work, but are having a hard time in convincing the Treasury.
IRAN
MORE SHIPS

It turns out that the four new warships, the order for which Vosper Limited, Portsmouth, announced on August 25, 1966, had been received from the Imperial Iranian government and which the Imperial Iranian Navy referred to as "destroyers", will not in fact be anything like the conventional fleet destroyers as we know them today, that is the big vessels with the heaviest possible gun and torpedo-tube armaments commensurate with the highest possible speed derived from orthodox propelling machinery comprising boilers and geared turbines, and built by most of the major naval powers during and since the Second World War.

Rather will they be a revival, in size but not layout, appearance, armament or propulsion, of the small destroyers of pre-war years and of the famous escort destroyers of the "Hunt" classes afterwards rerated as frigates.

In fact the four ships being built for the Iranians are to the Vosper Mark 5 Frigate design, an improved and considerably enlarged version of the handsome and successful corvette type now proved in service in the navies of Ghana and Libya. So the evolution and development of this new type has been entirely different — not from diminutive steam torpedo boat to destroyer but from the Vosper conception of small corvette to frigate.

The artist's impression of the Vosper Mark 5 Frigate.

The artist's impression of the Vosper Mark 5 Frigate, while not picturing the exact design of the ship which will be delivered to Iran, has been provided by the builders as being quite sufficiently to give readers a good general idea.

Two of the ships will be built at Woolston, Southampton, shipyard of John I. Thornycroft & Co. Ltd., recently taken over by the Vosper Group, and two at the New Castle-upon-Tyne shipyard of Vickers in conjunction with Vosper, thus perpetuating the association of the two firms initiated with the building of the recent corvettes.

It is estimated that the new frigates will turn out at about 1,200 tons displacement. As well as one main gun forward they will be armed with powerful anti-submarine and anti-aircraft weapons, and will have a very high speed obtained from Bristol Siddeley marine Olympus gas turbines, with diesel triple-hulled anti-submarine depth charge motors. Her propelling machinery comprises two Admiralty three-drum boilers and a two-shaft arrangement of Parsons geared turbines aggregating 50,000 shaft horse-power designed for a speed of 35 knots. She will doubtless require extensive modification to render her suitable for conditions in the Imperial Iranian Navy and in particular for exacting service in the Persian Gulf.

ITALY
POLARIS

The guided-missile cruiser "Vittorio Veneto" (8,850 tons) is to be fitted with Polaris and a helicopter platform. She has been taken in hand for a refit at Castellamare di Stabia near Naples.

NORWAY
IROQUOIS HELICOPTERS

In addition to the 16 Bell UH-1F's in service or in process of delivery to "Lufotrafveret", the Norwegian Government is to place supplementary orders for the Iroquois to bring the total for tri-service operation to 40 helicopters of this type. One Iroquois will be carried by each Norwegian Navy "Osto" class destructor.
JAPAN
GIANT DRY DOCK

The Hitachi Shipbuilding and Engineering Company has announced plans to construct a 400,000-ton deadweight building and repair dock at its Sakai shipyard in western Japan by the end of next year.

The giant dock will be 1,246 ft. long, 203 ft. wide, and 29 ft. deep. One of the three 173,900 ton deadweight oil tankers, ordered by Shell International Marine of London, will be the first vessel to be built there.

UNITED KINGDOM
NEW-LOOK CHARTS FOR ROYAL NAVY

New-look, easier to read charts are to be produced for the Royal Navy, according to the annual report of the Hydrographer of the Navy, Rear-Admiral G. S. Ritchie.

Features of the new charts, which will be available later this year, are the use of colour to show land areas and inter-tidal zones modern symbols to mark traditional features and modern lettering and numerals.

Though designed for the Royal Navy, admiralty charts are widely used by merchant fleets of many countries. Last year’s sales of charts and sailing directions totalled $1,665,000.

An agreement with Australian authorities resulted in the reproduction of 12 Australian charts during the year. The resulting improvement in charting applied in particular to here recent mineral developments necessitated charting of new and expanded ports.

MINELAYER LAUNCHED

One of the rarest ships in the Royal Navy — a minelayer — was launched on January 27. In line with the tradition she was named “Abdiel” and she was built by Lady Hopkins, the wife of Admiral Sir Frank Hopkins, Commander-in-Chief, Portsmouth.

“Abdiel” is designated an exer-layer and will have a displacement of about 1,500 tons, an extreme length of 265 ft. and a beam of just over 38 ft. She will be powered by two Paxman “Ventura” diesel engines. Her complement will be 14 officers and 109 ratings.

SIXTH NUCLEAR SUBMARINE
DEFINITE

Vickers Ltd. has been awarded the contract, worth about $20m. (£550m), to build the Royal Navy’s sixth hunter-killer submarine at Barrow-in-Furness, and it was announced in London that a seventh of the type is to be ordered later this year.

The submarine, with a submerged length of 360 ft., beam of 36 ft., and displacement of 4,000 tons, will be armed with the new Polaris anti-submarine weapon. The submarine will be the first vessel to be built there.

SUB AID FISHERMEN

British scientists have designed a two-man submarine to help deep-sea fishermen catch more fish.

The project, still in the blueprint stage, was announced at the London International Engineering and Marine Exhibition.

The submarine, with a submerged draft of six knots, could carry a pilot and observer 600 feet under water.

They could follow the trawl net of a fishing vessel to see how it behaved — and how fish entered it.

UNITED STATES OF AMERICA

SUBMARINE NAVIGATION

U.S.N. has awarded Sperry Rand a $15m. (£4m.) contract to continue development of the Polaris-Position submarine navigation system, which constantly provides the position, altitude and velocity needed to put the missiles on target. Accuracy goals are reported to be 400 per cent better than the system now backing the Polaris A-3 system.

One microminiaturised digital computer will replace the three computers now used, and a new technique will be employed for calibrating at sea the system’s inertial gyros.

M.C.M. SUPPORT

One of the most remarkable looking specialist warships ever commissioned to the U.S.S. “Ork”, its first mine-counter-measures support ship ever built for the United States Navy. This vessel has had a very chequered history. Originally intended to be a transport with the designation AP 107, she was actually designed as a Large (Cruiser) Mine-layer and numbered CM 7, but she was subsequently converted into a vehicle landing ship and redesignated LSV 2.

Originally built by Willamette Iron and Steel Corporation, Portland, Oregon, she has latterly been entirely rebuilt as a minesweeper and converted to the Dry Dock Corporation, Norfolk, Virginia, and she is now capable of transporting, maintaining, operating and supporting with anti-submarine warfare equipment.

The submarine, with a submerged length of 455 ft. and a beam of 60 ft., is capable of carrying 20 aeroplanes and 400 men. The submarine, with a submerged length of 455 ft. and a beam of 60 ft., is capable of carrying 20 aeroplanes and 400 men. The submarine, with a submerged length of 455 ft. and a beam of 60 ft., is capable of carrying 20 aeroplanes and 400 men.

“STANDARD” ANTI-AIRCRAFT MISSILES

U.S.N. contract worth $120m. has been awarded to General Dynamics Pomona Division for quantity production of the Extended Range (ER) and Medium Range (MR) Standard anti-aircraft missiles that will replace Terrier, Tartar and Talos missiles on ships now equipped with the "3 Ts" range, which, according to Defence Secretary McNamara, have proved "disappointing" in service. Closely resembling the Tartar-Terrier missiles, also designed by GD, the Standard missiles can be used in their place with...
minor changes to magazines, radars, and launchers on the guided missile ships, but improvements incorporated are reported to make the Standards twice as effective with unliability rate halved and shipboard test equipment and maintenance eliminated. Pre-firing warm-up time on the launcher is reported to have been reduced from about 30 sec. to one sec. The ER and MR versions differ only in propulsion, and feature solid state electronics, re-packaging, maintenance simplicity, faster reaction time, a semi-active homing guidance system (said to incorporate improved penetrability against counter measures) and enlarged growth potential. Standard MR, to replace the RIM-24B Improved Tartar, has dual solid thrust propulsion, a launch weight of 1700 lb., a max. altitude of 50,000 ft., and a range of 35 miles. Standard length is 5 ft. (ER, with booster, 27 ft.) and diameter 13 in.

POSEIDON
The United States is to fit the Poseidon missile into 31 of their 41 ballistic missile submarines. The remaining 10 will have the A3 Polaris missile. Both missiles are to have the MRV multiple warheads. In this system, each warhead is capable of being guided on to a different target.

OCEANOGRAPHIC BUOYS
The U.S. Navy has recently been carrying out experiments with large buoys moored in deep water and fitted with electronic devices to collect oceanographic data and transmit it to the shore, over considerable distances, by H.F. radio.

The buoys are said to be as much as 40 feet in diameter, weigh 50 tons and are topped by a 40 foot aerial mast.

Although the buoys are expensive, they are said to be much cheaper in the long run than using ships to obtain the same data.

U.S.S.R.
FLEET CONTROL
A system of controlling Russia's merchant fleet based on the use of computers is being developed in the Soviet Union, according to the Soviet News Agency, Tass. Soviet sea transport had become one of the most complex, multi-faceted branches of the national economy, creating a need for such a system, Tass said.

RUSSIAN NAVAL STRENGTH
IN THE BALTIc
Over a quarter of the Soviet Navy is currently based in the Baltic, according to a statement issued by the West German Defence Ministry. Its present strength there is said to consist of the following:

- 5 Conventional Cruisers
- 4 GM Ships
- 20 Conventional Destroyers
- 20 Escort Destroyers
- 130 Minesweepers
- 185 Fast Patrol Boats, of which 65 have guided missiles
- 130 Minesweepers
- 70 Landing Vessels
- 80 Submarines
- 200 Naval Aircraft

The German report stresses the build-up of Russian amphibious capacity in the Baltic and it is stated that the Warsaw Pact countries have, for many years, carried out amphibious landing exercises in the Baltic area.

NEW Towed SONAR
Brief details have been released of a new towed sonar being developed by the Hughes Aircraft Company for the U.S. Navy.

It is apparently a listening sonar only and consists of a string of hydrophones which are towed at a great distance astern of the ship and, when necessary, at great depth. In addition to the underwater array there are five cabinets of processing and display equipment on board the ship.

AIRCRAFT DEVELOPMENT
Development of a torpedo-carrying version of the Hughes OH-6A, possibly for the U.S. Navy, is now being undertaken. Cabable of carrying two 400 lb torpedoes, it will feature a longer undercarriage and will be cleared for deck operations.

Several European navies are allegedly evincing interest in this development.

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Navy League Visit to U.S.C.G.C. “Glacier”

On 19th March last, about 150 Fellows of the New South Wales Division and their friends inspected the U.S. Coast Guard Cutter GLACIER (WAGB-4), the United States’ largest and most powerful icebreaker, which is under the command of Captain Opie L. Dawson, U.S.C.G.

“Glacier” was designed and constructed to open polar regions never before accessible to ships. Her primary missions are to provide icebreaking services and to support polar scientific research programs. Her tasks include the escorting of other ships through the ice, logistic support of polar stations, oceanographic and survey work, and weather ice observations in polar regions. She also shares the responsibility of protecting life and property on the high seas with her sister Coast Guard cutters.

As a U.S. Navy vessel, “Glacier” participated in each of the Navy DEEP FREEZE operations in the Antarctic from 1955 to 1965. Her transfer to the U.S. Coast Guard on June 30, 1966, did not alter that assignment; she continues to lead the annual re-supply mission.

She is fitted with the largest diesel-electric propulsion plant afloat, with a total of 31,000 horsepower. Designed to provide flexible power for continuous icebreaking operation. Two 17° 06”, 17 ton propellers are mounted on shafts over two feet in diameter. Shafts are driven by two 10,500 horsepower motors that receive power from 10 diesel-driven generators. Maximum speed is 18 knots.

To loosen gripping ice “Glacier” has a built-in heeling system that induces an artificial 10 degree roll by rapidly pumping 140,000 gallons of water from side to side.

The ship has a flight deck, hangar and maintenance facilities for two helicopters, used for ice reconnaissance, transport, and exploratory work. “Glacier” is equipped for scientific research and data collection with oceanographic, hydrographic, and photographic laboratories, as well as deep-sounding equipment and extensive communications and radar capabilities.

— Official Coast Guard photograph.
NEW SOUTH WALES DIVISION

Report of Activities and Training Undertaken by the New South Wales Division for the Quarter Ending 31st March, 1967.

Periods of continuous training were carried out in the following establishments and the opportunity was taken to conduct courses as indicated.


A total of 200 Cadets plus Officers and Instruction attended these courses.

Harbour and weekend training took place in the following ships and establishments.

H.M.A.S. "Vendetta", 10th-12th February.


H.M.A.S. "Creswell", 10th-12th March.


The Annual Swimming Carnival was held in H.M.A.S. "Penguin" on Saturday, 25th February, at which some 200 Cadets and parents were present. Both T.S. "Tobruk" (Newcastle Unit) and T.S. "Sydney" (Snapper Island) topped the point score, gaining equal first place.

Unfortunately, due to inclement weather on Sunday, 26th February, there was no option but to cancel the transfer of the A.S.C.C. Colour from T.S. "Tobruk" (Newcastle Unit) to T.S. "Albatross" (Wollongong Unit). The ceremony had been scheduled for 1500 in H.M.A.S. "Watson".

L. MACKAY-CRUICE
Lieut-Commander R.A.N.R.
Senior Officer.

Annual Church Parade of the New South Wales Division

The annual Church Parade of the New South Wales Division of the Corps was held at H.M. Australian Dockyard Church, Garden Island, Sydney, on Sunday, 7th May, 1967.

More than 300 Cadets paraded and were inspected prior to the Service by the Flag Officer in Charge, East Australia Area, Rear Admiral T. K. Morrison, C.B., C.B.E., D.S.C. (see photograph, front cover).

The Service was conducted by the Reverend L. W. Long, Thl., R.A.N., and the lessons were read by Petty Officer Ian Hind, A.S.C.C. and Rear Admiral T. K. Morrison. The Division's Colours were "laid up" in the Sanctuary during the Service.

The East Australia Area Band of the Royal Australian Navy, conducted by Lieutenant N. G. Gullick, R.A.M., R.A.N., provided the music for the service which commenced with the Hymn "O God Our Help in Ages Past", then followed the Seafarer's Psalm, Psalm 113.
Best wishes from STEWARTS...

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—and—
ALBION HOTEL
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HULL SPEED AHEAD
Japan's rapidly growing shipbuilding industry has been given another edge over its competition with a new automatic welding system developed by a team of engineers. The machine, which embodies nine welding processes, makes it possible to weld a ton of steel in seven hours — half the time required by conventional methods. With the new device, the Japanese say they can build a 100,000 ton vessel in four and one-half months (compared with a normal seven to eight months). The welder, jointly developed by Kawasaki Dockyard, Kobe Steel, Yawata Steel and Osaka Transformer Manufacturing Co., is capable of handling bottom welds and welds in curved hull plates. The engineers responsible have been given the Okochi Memorial Award (the highest award for scientific achievement in Japan), for outstanding industrial development.

The service concluded with the hymn "Soldiers of Christ Arise", the National Anthem and the Blessing.
A large number of families and friends of the Cadets witnessed the Parade and Service, which events were mentioned over the radio news and featured in the daily press and by TV Channels 2 and 10 during subsequent programmes.
At the conclusion of the Service, the Division, led by the R.A.N.R. band, "Marched Past" outside the Chapel, Admiral Morrison taking the salute.
The Editor is always pleased to receive news and photographs concerning the activities of all Divisions of the Corps.

AHOY THERE!
A new life raft that might be mistaken for an unidentified object from outer space, but which will carry and shelter from sun, wave and wind as many as 30 survivors, has been invented by Danish boatswain Anton Bak Sorensen. The doughnut-shaped Survivosphere is fire-resistant and carries its passengers inside the welded hull. Power is supplied by an 18 h.p. Evinrude outboard motor that propels the 4,500 pound craft at 10 m.p.h. The Survivosphere is a prototype craft and production costs are not yet available.

Members of the Australian Sea Cadet Corps, New South Wales Division, marching to H.M. Australian Dockyard Church, Garden Island, Sydney, to attend the Division's Annual Church Parade.

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Phone 95-4131

Page Forty-six THE NAVY May-June-July, 1947
**JOIN THE AUSTRALIAN SEA CADET CORPS**

If you are between the ages of 13 and 18 years

The Australian Sea Cadet Corps is a voluntary organisation administered by the Commonwealth Naval Board and the Navy League of Australia.

The aim of the Australian Sea Cadet Corps is to provide for the spiritual, social and educational welfare of boys and to develop in them character, a sense of patriotism, self-reliance, citizenship and discipline. Uniforms are supplied free of charge.

Cadets are not required to undergo any medical examination and are fully insured against accident while on duty.

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

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

Instructional camps are arranged for Sea Cadets in Naval Establishments, and they are also given opportunities, wherever possible, to undertake training at sea in ships of the Royal Australian Navy. Cadets, if considering a sea career, are given every assistance to join the Royal Australian Navy, the Mercantile Marine or the Royal Australian Naval Reserve, but there is no compulsion to join these Services.

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

Senior Officers, Australian Sea Cadet Corps

New South Wales: "El Abrigo", 4 Rangers Ave., Cremorne.
Queensland: C/- Box 376E, G.P.O., Brisbane.
South Australia: C/- 30 Pirie Street, Adelaide.
Tasmania: C/- 11 Quorn Street, Sandy Bay, Hobart.
Victoria: Room 8, 8th floor, 528 Collins St., Melbourne, C1.
Western Australia: 182 Coode St., Como.
Australian Capital Territory: Industry House, National Circuit, Barton.
Northern Territory: Box 444, P.O., Darwin.

TO: The Senior Officer, Australian Sea Cadet Corps

I am interested in joining the Australian Sea Cadet Corps and would be pleased to receive further information.

NAME

ADDRESS

PHONE NO.

STATE OR TERRITORY

AGE

(Please print clearly)

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

May-June-July, 1967

THE NAVY

Page Forty-eight
Argentina has always shown a lively interest in naval affairs. Whenever any new warship type has been evolved or developed out of the orthodox by the chief maritime countries abroad, Argentina has shown a ready appreciation of the major warships of the principal naval powers as potential for her own Navy. This is because of Argentina's financial position. Similarly, when Argentina came straight to Great Britain and the U.S.A. and the U.S.S. in particular for the construction of four general purpose frigates of the “Leader” class — two from J. Samuel White & Co. Ltd., Cowes, Isle of Wight, and two from Yarrow & Co. Ltd., Scotstoun, Glasgow. This first rate and very versatile anti-submarine class of improved “Type 12” had proved to be highly successful and more than one country abroad were casting envious eyes in their direction. Unfortunately only four months later it was officially stated that the orders had been shelved for an indefinite period because of Argentina's financial position. Similarly, John I. Thornycroft & Co. Ltd. and Thornycroft & Co., Southamton, were selected by the Argentine Navy to build six non-magnetic coastal minesweepers of the well-proved British “T” class, built in large numbers for the Royal Navy. The order was placed at the same time as that for the frigates but was also shelved later for reasons of financial stringency.

Now comes an echo from those distant shores in Argentina still has a requirement for both escorts of the “Leader” size and the coastal minesweepers and taking belated steps to acquire them, but whereas the original acquisitions would have been new ships and all from Great Britain, giving work to three shipyards (of which White's has since gone out of business as shipbuilders, and Thornycroft's has been merged with Vosper's) the acquisitions presently decided are secondhand ships and only the coastal minesweepers will be purchased from Great Britain, the inducement for the bigger warships going to the United States.

From the U.S.A. the Argentine Navy is getting two destroyers of the later “Fletcher” class, “Charles J. Badger” and “Hickox,” both completed in 1943, the former by the Bethlehem Steel Company San Francisco, and the latter by the Federal Shipbuilding & Dry Dock Company, Port Newark. With a displacement of 2,050 tons standard and 3,050 tons full load, they have a length of 376½ ft. overall and a beam of 39½ ft. They originally carried five 5-inch, 10 and 40 mm. anti-aircraft guns, but are being re-armed with four 5-inch guns and six 3-inch dual purpose guns. They are also armed with five 21-inch, two 24-inch and 16-inch tubes, two side launching torpedo racks and a depth-charge rack. Their propelling machinery comprises four Babcock & Wilcox boilers supplying high pressure superheated steam to a two-shaft arrangement of General Electric geared turbines developing 60,000 shaft horsepower and equal to a speed of 34 knots. With a bunker capacity of 450 tons of oil fuel they have an endurance of 6,000 miles at 13 knots. They have accommodation for 24 officers and 300 men, but normally have a complete
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in Adelaide Wine and
Restaurant
dine at the . . .

PORT ADELAIDE
Service Station

Best wishes to the Boys from . . .

The representation of British-built and United States-built warships in the Argentine Navy is al-
to assume a more formidable and very considerable. The fleet comprises the aircraft carrier "In-
dependencia," formerly the British Royal Navy's "Victory," 19,540 tons full load, and the
submarines "Santa Fe" (ex-U.S.S. "Lamprey") and "Sanctiago de Estero" (ex-U.S.S. "Macabu"),
4,242 tons submerged; the cruisers "General Belgranito" (ex-U.S.S. "Phoenix") and 9 "de Julio"
(ex-U.S.S. "Boise") both 13,645 tons full load, and the British-built "La Argentina," 8,630 tons full load; nine destroyers, in-
cluding the three former U.S. vessels mentioned above, and six
British-built ships of 2,000 tons full load, two from Vickers-Armstrongs Ltd., Barrow-in-Furness, two from
Cammell Laird & Co. Ltd., Birkenhead, and two from John Brown & Co. Ltd., Clyde-
bank; three frigates, two of 1,400 tons full load built at Astillero Nav. Rio Santiago, and one form-
er U.S. vessel of 2,415 tons full load; three corvettes, two of 1,032 tons full load built at the Rio San-
tiago Naval Yard and one former British vessel of 1,375 tons full load; four minesweepers built in local shipyards; a U.S. built motor
torpedo boat; eight patrol vessels, all former U.S. units; three survey-
vessels; five landing ships; two medium landing ships; three infantry landing craft; a salvage vessel, two training ships, five
transports, four oilers, an ice-breaker (Argentine research ship), and
10 tugs.

Rescue Submarines For The United States Navy

The Navy has ordered the first of six baby subs designed to rescue
crews from disabled submarines.

The 25-ton, 44-foot long "sub-
marine rescue vehicles" will be
equipped also for underwater re-
search, oceanography and for search
missions.

Lockheed Missile and Space Co.
Sunnyvale, California, has been
asked to build the first model. Fol-
lowing evaluation, contracts will be
awarded for the five sister craft.

The baby subs mark the first step
in developing an operational sub-
marine location, escape and rescue
system under the Deep Submergence
Systems Project run by the Special
Projects Office. The need for the
subs was illustrated by the loss of
19 men in the "Thresher" disas-
ter three years ago and the long
and arduous search for Air Force's
lost H-bomb off Spain.

The size of the baby subs is dic-
ted by the requirement that they
must be able to respond to a sub-
marine disaster anywhere in the
world in 24 hours. They will be
bred, fully assembled, in a C-141
aircraft, in a surface ship, or piggy-
back on a nuclear submarine. The
rescue subs should be able to oper-
ate under any weather conditions
and under ice.

At a disaster, the subs will oper-
ate from a mother submarine or a
surface ship, making shuttle trips
to the sunken submarine, and could
take a crew of 12 to 14 survivors
each time.

The prototype will be operational
early 1968 and the rest of the
fleet will be in service by the end
of 1970. This will give the Navy a
two-ocean rescue capability.

Existing miniature subs like the
"Alvin" and "Aluminaut" were used in the H-bomb search, but they
have no submarine rescue equip-
ment and are not very maneuver-
able.

Lockheed already has under con-
struction a research submarine,
"Deep Quest," which will be in
operation this fall. A 50-ton, mul-
nission research craft, "Deep Quest" will carry a crew of four and 7,000
pounds of scientific equipment to
a depth of 6,000 feet.

The problems of operating at
extreme depths was emphasised by
Lt. Comdr. J. Bradford Mooney at a conference on oceanography here
told of a close call in the
bathyscaphe "Trieste II" off Cape
Cod.

"We were down to 8,400 feet searching for the "Thresher" ren-
ains when an electrical short
went out in the H-bomb tank,"
Mooney said. "It was only inches
from a gas tank and, of course, that
could have been fatal." This
was the first mention of the near
disaster.
Best of wishes from . . .
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Best wishes from . . .
THE NAVY
MAY-JUNE-JULY, 1967

H.M.A.S. "PERTH"
By JOHN MORTIMER

H.M.A.S. "Perth" is one of three modified Charles F. Adams class destroyers purchased by Australia from the United States. The "Perth"'s sister ships are the "Hobart" and "Brisbane". The "Perth" was laid down and be agained on the 21st of September, 1965. She was subsequently commissioned at Boston, Massachusetts on the 17th July, 1965.

While the "Perth" was under construction, officers and men of her crew undertook courses in the United States to familiarise themselves with their new weapon. As part of her commissioning the "Perth" carried out a series of trials and tested her Tartar missile system. These were successful, and in March, 1966, the "Perth" reached Australia.

During March and April, 1966, the "Perth" made visits to all the Australian capital cities. On the ship was open to public inspection. When this was completed, the "Perth" returned to Garden Island, where it has remained, apart from coastal exercises.

The reason for the "Perth"'s inactivity has been due to her being fitted with the America Guided Missile. The Tartar Anti-Submarine missile. The "Perth" is the first destroyer in the world to be fitted out with the Ikaras missile system and has recently carried out sea trials with the missile. The Ikaras now makes the "Perth" more advanced than her American counterparts which are fitted with the Atao Anti-Submarine missile. However, this missile lacks both the range and accuracy of the Australian built weapon.

The Ikaras carry a homing torpedo and are controlled from the ship until it drops its torpedo in the vicinity of the submarine. Then the homing device guides the torpedo to its target. The mechanism of this is simple and direct.

The "Perth" is also armed with the Tartar Surface to Air missile system, which has a range of 15 to 20 miles. The missile has one rocket engine, which, when fired, produces a sound quieter than that of sound.

The engine then cuts back its power to give the missile endurance for a long high-speed chase. The Tartar missile is fired from the ship's radar, but once in flight it changes to its own guidance system which enables it to follow a moving target. The "Perth" has a single rail launcher in "X" position and carries 42 missiles.

The "Perth" also has two single tubes 5 inch 34 caliber, rapid firers fully automatic guns. One is placed forward in the "A" position and the other in the aft "Y" position.

Besides this formidable armament the "Perth" also has two triple anti-submarine torpedo launchers. These have a shorter range than the Ikaras and are found on both sides of the deck just behind the forward 5 inch gun turret.

This fire-power is linked with a control system that automatically selects targets, aims the weapons, and then locks them onto the target.

The "Perth" has a standard displacement of 3,370 tons and a full load displacement of 4,500 tons. She has an overall length of 457 feet, her beam is 47 feet and her draught is 20 feet.

The "Perth"s" geared steam turbine engines have a shaft power to develop 70,000 shaft horse power and this gives her a speed in excess of 30 knots.

The "Perth" also has the latest equipment in long range sonar and radar. This, coupled with her communication and electronic equipment, provides the operations room with the necessary up to date information.
VISITS TO AUSTRALIAN PORTS BY THIRTEEN U.S. WARSHIPS TO COMMEMORATE THE 25th ANNIVERSARY OF THE CORAL SEA BATTLE

Admiral David L. McDonald, U.S. Navy Chief of Naval Operations, Official Guest of Honour at the 25th Coral Sea Celebrations, is the most senior U.S. officer to come to Australia since General MacArthur.

Although it is traditional for the Guest of Honour to be a four star officer, this marks the first time that the head of a U.S. military service has taken part in the festivities.

Aged 57, he joined the U.S. Navy in 1924 and has built a reputation as a "master diplomat", a "tough across the table operator in uniform" and is a most likeable and personable man of great character.

He wanted to be a lawyer, but once he had decided to join the Navy, he was soon at sea and as the years have passed, has carried out many difficult assignments.

In 25 years he rose from Ensign McDonald (1928) to Admiral McDonald (1963).

A chronological transcript of Service shows rapid advancement at sea and on land, and decorations during service at sea and in war.

Citations issued upon conferring of honours show Admiral McDonald has been decorated many times.

In World War II he won the Bronze Star Medal when as OIC of the Combat Information Centre of USS "Essex", he evaluated and disseminated combat information which contributed to a decisive defeat of Japanese units in the Battle of Leyte Gulf in 1944.

He is entitled also to wear the Presidential Unit Citation (USS "Essex") for "extraordinary heroism in action against enemy forces in the air, ashore and afloat, in the Pacific War from August 31, 1943, to August 15, 1945.

In post war years he has been Commanding Officer of the carriers "Mindoro" and "Coral Sea", Commander Carrier Division 6, Commander Sixth Fleet and Commander Naval Striking and Support Forces, Southern Europe.

He was awarded the Distinguished Service Medal for "extraordinarily meritorious service" as Commander Sixth Fleet from July 13, 1961, to March 18, 1963.

He became Chief of Naval Operations Navy Department in August, 1963.

A free thinker and forceful speaker, Admiral McDonald pulls no punches when addressing gatherings.

The Anti-submarine warfare carrier "Bennington", the Fleet replenishment ship "Sacramento" and the destroyer "Epperson" visited Sydney;
the Guided Missile cruiser "Canberra", two destroyers of the "Frank Knox" class, "Turner" and "McKean", visited Melbourne, the destroyer of the "Allen M. Sumner" class, "Maddox" and the Guided Missile armed Destroyer Leader of the "Leahy" class, visited Adelaide; the Amphibious Transport Dock of the "Opean" class, "Deluth" and the "Balao" class submarine "Blackfin", visited Perth; the "Balao" class submarine "Carbonero" visited Geraldton and the two converted "Fletcher" class destroyers "Fletcher" and "Nicholas" called at Brisbane.

All vessels being under the overall command of Rear Admiral Ralph Weymouth, Commander Anti-submarine Warfare Group One.

After a week of official function, entertainment and sightseeing, the ships sailed for California on May 7, 1967.

S-2E Grumman tracker aircraft from the carrier Bennington.

**SEA CADET CORPS NEWS**

**QUEENSLAND**

SEA CADETS HELP

TASMANIA

The sum of $119.90 has been forwarded to the Senior Officer of the Tasmania Sea Cadet Division for the relief of the families of Sea Cadets affected by the recent disastrous fires in Tasmania.

This gesture was initiated by the Welfare Committee of T.S. "Gayundah" and supported by the Officers, Instructors and Cadets of both T.S. "Gayundah" and T.S. "Paluma", including the Welfare Committee of the latter Unit.

Both "Paluma" and "Gayundah" are outstanding Units in Queensland. In 1961 "Gayundah" won the Navy League Efficiency Trophy and Paluma is the current holder of the coveted Trophy.

The spirit of mutual help and cooperation which exists between them and other Queensland Units has now been extended outside the state. This can only reflect credit on the A.S.C.C. in general.

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X-ray bursts new defence from missile attack

Tremendous bursts of X-rays from high altitude thermo nuclear explosions will be used to destroy incoming ballistic missile warheads in a revolutionary development of the U.S. missile defence system.

This was disclosed in testimony before the Senate Foreign Relations Committee's disarmament sub-committee, released in Washington recently.

Experts said the new approach of using X-rays for destruction of warheads has opened up a whole new concept in ballistic missile defence and made it possible to develop an "area defence" against missile attack.

The wide destructive range of the X-rays has greatly simplified the complex problem of intercepting and destroying enemy missile warheads.

For high-altitude interception it is no longer necessary for the defensive missile to be aimed directly at the incoming warhead — a problem in ballistics that has been compared with trying to hit a bullet with another bullet.

Because the destructive range of the X-rays extends for several miles, the defensive missile has only to be fired in the general vicinity of the incoming warheads.

Furthermore, it will be possible with relatively few defensive missiles to provide a "first line" defence for all of the United States or an Allied country against small-scale missile attacks, such as might be launched in the future by Communist China.

There has been considerable speculation in recent months that the use of X-rays was a key element in the Nike-X missile defence system being developed by the Pentagon.

The first official confirmation of this development has now come from Dr. John S. Foster, director of defence research and engineering in his evidence before the Congressional group.

In heavily censored testimony Dr. Foster said "a change in the concept of the nuclear warhead" had permitted an "advance" in ballistic missile defences "which made area defence feasible."

The change, he said, was to "a high-yield nuclear warhead" — a technical epithet used by officials for a thermonuclear warhead with a yield measured in megatons or millions of tons of T.N.T.

The fact that the thermonuclear warheads would depend upon X-rays for their destructive effect came out indirectly in a question by Senator Albert Gore of Tennessee, the sub-committee chairman who asked Dr. Foster to indicate "just what would be the kill radius from X-rays?"

Dr. Foster's answer was deleted by Pentagon censors, but the Gore question was left in the published testimony because of the sub-committee's insistence that the Pentagon's reply should not extend to censorship of questions asked by Senators.

From the subsequent statements by Dr. Foster, however, observers said it was apparent that in his censored testimony he had been talking about a "kill radius" measured in miles from X-rays.

N.W. Cape Radio to Operate in June

The U.S. Navy's V.L.F. radio station at North-West Cape became operational on June 11—11 months late.

Some circuits in the installation are already in use and others will be handed over to the station's permanent staff each week.

Training procedures are under way and although the station will be operational in about eight weeks, these procedures could go on until August.

Some of the buildings attached to the station may not be completed until July. Major construction contracts should have been completed by March last year, making them about 15 months late.

However, by improvising some accommodation and moving into some buildings before they have been completed, the Navy has been able to make up some of this time.

About half the 350 American military personnel to be stationed at North-West Cape have already arrived and recruiting has started for the 400 civilians to be employed.

Almost all these will be Australians.

The supply jetty at the Cape, delays on which have caused bottlenecks in other work, is still not completed.

But it has been used by vessels since January.

Coastal ships used it then and ocean-going ships, including a tanker, have called since.

Completion of the station and its support facilities will end a long complex and dispute-riddled project.

The first American Navy staff on the project arrived in W.A. in June, 1962, and the first major construction contract was awarded a year later.

There have been claims for millions of dollars against the U.S. Navy by contractors and more are still to come.

The original cost of the project was between $60 and $80 million, but until all claims are settled no one knows the cost today.

The V.L.F. — very low frequency — radio station will be used for contacting U.S. Navy vessels and bases and particularly submarines.
Anti-sub War in Navy Trainer

Battle situations of an entire anti-submarine warfare task force can be simulated by an electronic trainer developed for the Navy by the Lockheed Electronics Company.

Designed to give officers and men practical experience in sub-hunting without the time and expense of sending ships and aircraft to sea, the equipment is already operating at the U.S. Navy's Atlantic Fleet Anti-submarine Warfare Tactical School.

The trainer has 36 individual units containing the same command and control equipment found on ships and aircraft of an anti-submarine force.

Eighteen of the units may be used as destroyers or submarines, 16 units as fixed-wing aircraft or helicopters, one unit as an anti-submarine carrier and one unit as a plotting centre of the task force commander.

In a make-believe ocean of 360,000 square miles, trains operate these simulated vehicles and their equipment in combat exercises against instructor-controlled target submarines.

Use of this equipment will make possible at least one week of co-ordinated A.S.W. tactical training per year for every A.S.W. decision-maker — from seaman to admiral — in the Atlantic Fleet. It can be done at a fraction of the cost of similar training at sea.

Actions and decisions will be observed and assessed by A.S.W. officers assigned to the school. This group is composed of surface, aviation and submarine officers. In addition, unit and ground commanders can observe and comment on actions and decisions of their subordinate commanders.

Why a ship is called "She"

A ship is called "she" because she's all decked out and usually pretty well stacked. She has pleasing lines from stem to stern and there's generally a gang of men around her. It's not her initial cost which breaks you — it's the upkeep. Her rigging costs a fortune and she always looks best in a new coat of paint.

Bows and bells are standard equipment and sometimes she wears a bonnet. There's usually a lot of bustle about her but she usually manages to show off her superstructure to advantage. When entering port she heads straight for the buoys — when sailing she usually knows her destination, but this is not common knowledge.

When you want to attract her attention, a whistle is the appropriate signal. In some parts of the world the man who takes care of her needs at home is known as her "husband", but when she goes out she leaves him at home. Once you really get to know her you never want to leave her.

On a balmy night she can make tired men forget their troubles. Finally, she has as many tricks and teases as any woman and consequently it takes a capable man to handle one properly.
FRESH WATER FROM SHIP

A ship-borne desalination plant of British design was described at an Athens conference on "Fresh Water from the Sea", held this month.

The ship would serve small communities on islands or isolated coastal sites, who have inadequate natural supplies of water.

A pipeline dropped overside would feed sea-water to a desalination plant housed in the ship's hull. A second pipeline would take the fresh water to storage ashore. The designers claim that this technique will give a cheaper supply than orthodox water tankers operating on a long haul from a mainland base.

Some 200,000 imperial gallons of fresh water could be supplied daily. Plans allow for the storage of 90,000 gallons on board, and the purification process can be carried out when the ship is underway.

Design of the ship is the work of the British Ship Research Association and the United Kingdom Atomic Energy Authority (who are responsible for co-ordinating all U.K. research on desalination).

The B.S.R.A. specification is for a twin screw single deck vessel of 1,350 long tons displacement having a length of 160 feet, a beam of 34 feet and draught of 12ft. 6in.

The desalination plant itself is a well-proven design by Weir Westgarth Ltd. of Glasgow, and would be housed on the main deck. Main engines and ancillary machinery for the purification plant would be situated aft, with accommodation and deck house and bridge forward.

Choice of main propulsion unit was of considerable importance in combining economic ship operation with the production of fresh water as cheaply as possible. The marine engineering division of B.S.R.A. investigated various prime movers and recommended a twin engine installation with reasonable reduction gears driving fixed-pitch propellers.

Complete with equipment, the vessel could be built in the U.K. to Lloyds plus 100 A1 classification at a cost of rather less than £400,000 ($1 million). Fresh water could be produced at about 26/- ($3.25) each 1,000 imperial gallons, including ship operating costs and depreciation.

This figure is based on distribution of fresh water to isolated communities in the Mediterranean or Near Eastern waters. However, the vessel, designed to operate in open water, could be used equally well in other parts of the world.

The design was outlined in a paper on "Mobile and floating flash-distillation plants" by two Atomic Energy Authority authors, K. D. B. Johnson, of Harwell, and D. W. Clelland of the engineering group, Risley.
After reading this you could find yourself all at sea

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‘CANBERRA’ Oriental Cruise. Oct. 19–28 days, from Sydney. Calling at Yokohama (Tokyo), Kobe, Nagasaki, Hong Kong. Returns Sydney. Fares from: First Class, £500 ($1,060); Tourist Class, £252/10:0 ($505).


‘HIMALAYA’ Christmas New Year Cruise. Dec. 25–13 days, from Sydney. To Noumea, Wellington, Picton, Auckland, Bay of Islands (Russell). Returns Sydney. Fares from: First Class, £164/10:0 ($329); Tourist Class, £110/10:0 ($221).

‘IBERIA’ Christmas New Year Cruise. Dec. 20–13 days, from Sydney. To Noumea, Wellington, Picton, Auckland, Bay of Islands (Russell). Returns Sydney. Fares from: First Class, £164/10:0 ($329); Tourist Class, wait list only.

Special Merry-Go-Round Voyage By ‘Himalaya’ Nov. 17–12 days, from Sydney. To Wellington, Auckland, Brisbane, Sydney. One Class fr. £78 ($156).

All dates and fares quoted are from Sydney back to Sydney. Mail coupon for the details of the cruise that interests you. Then see your Travel Agent or P&O for reservations.

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