The CROWSNEST

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The CROWSNEST

Vol. 14 No. 6 THE ROYAL CANADIAN NAVY'S MAGAZINE APRIL 1962

CONTENTS

The Cover—Silhouetted against the sunset while cruising the South China Sea with ships of the Second Canadian Escort Squadron in February of this year is HMCS *Ottawa.* The frame is the design used to encircle all RCN ship badges. (CCC2-671)

OUR NAVY

This is the tenth edition of *Our Navy* and the fourth which has appeared as a special issue of *The Crowsnest.*

A number of the articles first appeared in the RCN issue of *Canadian Shipping and Marine Engineering News,* Toronto. Most of the regular *Crowsnest* departments have been omitted to make way for special features.

On the Opposite Page: Early this year HMCS *Crescent* sailed from Halifax to carry out trials in European waters with her Canadian-designed variable depth sonar. She is shown entering Gibraltar after exercising with NATO forces in the eastern Atlantic and Mediterranean in mid-March. (HS-67600-88)

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The Purpose of the RCN

TIME HAS NOT dulled, nor have new weapons, new strategies or new international situations altered the essential purpose of the Royal Canadian Navy.

The RCN's purpose is to assure, with the co-operation of the forces of the free world, that Canada will be able to utilize the seas, without restriction, in peace or war.

In support of this purpose, the Royal Canadian Navy is charged with the defence of sea lines of communication through control, escort and convoy of shipping, the guarding of our shores from attack from the sea—in these days of submarine-launched missiles a more serious threat than ever known before—and the contribution of forces to the NATO mutual defence system. It may be asked to lend support to the United Nations, whenever and wherever it is required.

The Royal Canadian Navy must, therefore, be ready at all times to undertake all or any of a variety of operational tasks, varied only by the circumstances, which could be a police action, a conventional war, or limited or all-out nuclear conflict.

More and more, as population pressures increase and standards of living rise, the countries of the world depend on each other. This is reflected in such statistical facts as the presence each day on the North Atlantic of an average of 3,350 merchant ships carrying millions of tons of cargo. Set against the fact that the vast majority of submarines in existence today are primarily equipped for the destruction of shipping, the importance of the Navy's role becomes apparent.

Although it is obvious from this that the Navy's main function lies in the field of anti-submarine warfare, other eventualities (the Korean War is an example) must be taken into consideration. It must be ready to transport, land and support Canadian Army units. It must be ready to provide mobile command and base facilities for the military undertakings far from home.

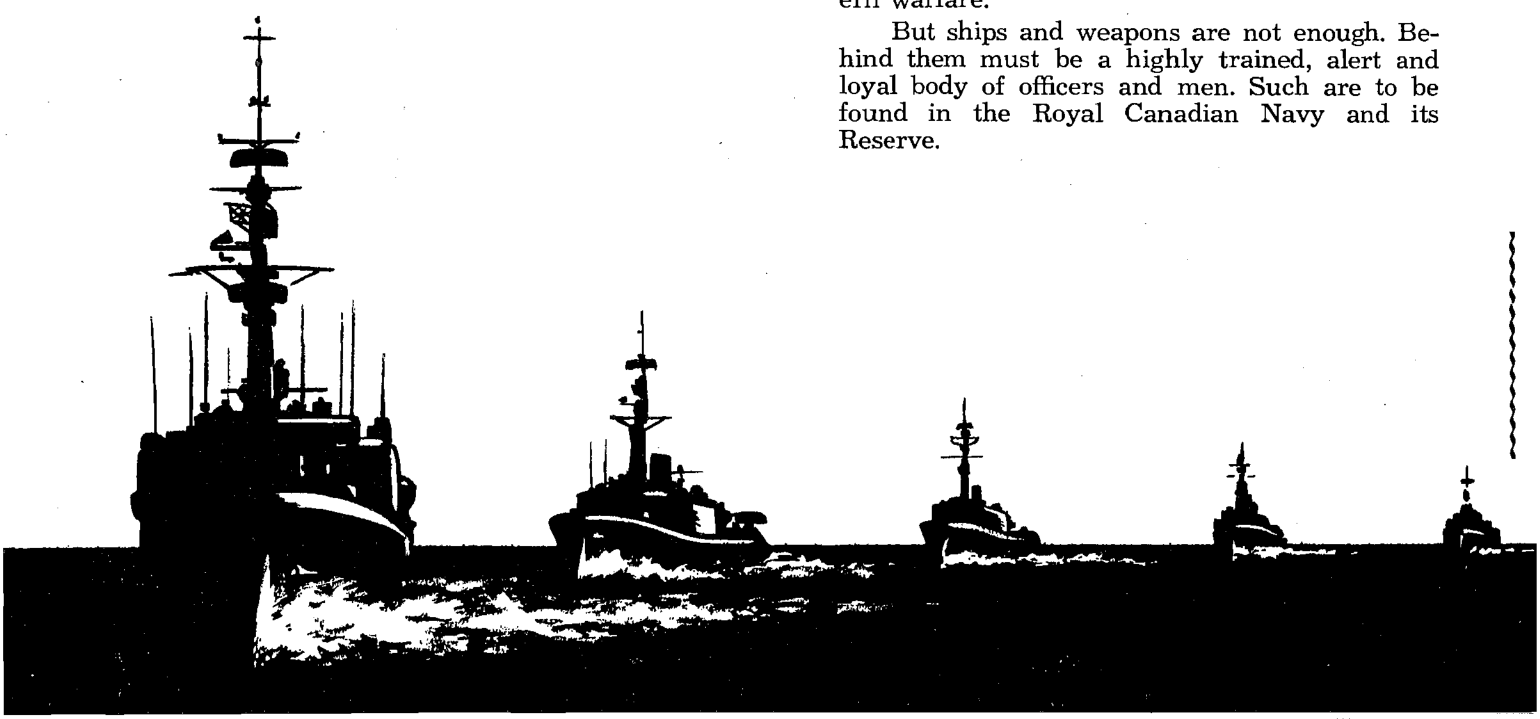
The Navy must give protection to Canada's coastline, by offshore patrols and inshore mine-sweeping operations. It must contribute early warning of attack from over, on or under the sea.

The most demanding task of all is based on the ability to find and destroy enemy submarines—a science which has been highly developed in the Royal Canadian Navy and one which is essential in the shepherding of convoys, the destruction of submarines proceeding to and from their areas of operation or the prevention of missile-armed submarines from coming within firing range.

In peacetime the skills and equipment of the RCN are called upon time and again to take part in search and rescue operations and in the performance of other humanitarian services. Should war come, these same resources will be available in the cause of national survival.

On the opposite page is tabulated, ship by ship, the strength which the Royal Canadian Navy at present possesses to carry out its allotted tasks. It will be apparent from the information given there that the RCN is far from a static force, that it is steadily improving its freedom of action and its weaponry to keep abreast of the formidable technological developments of modern warfare.

But ships and weapons are not enough. Behind them must be a highly trained, alert and loyal body of officers and men. Such are to be found in the Royal Canadian Navy and its Reserve.



COMPOSITION OF THE FLEET

The Royal Canadian Navy's 62 commissioned ships (a 63rd will be added in October) range from an aircraft carrier through 14 modern destroyer escorts, 11 destroyer escorts of earlier design, 18 frigates, a submarine, 10 minesweepers, two escort maintenance ships and down to seven smaller craft. Two Royal Navy submarines serve in the Atlantic Command under the operational control of the RCN. Three ships are on loan to other government departments. There are 129 auxiliary vessels, ranging from survey ships, oilers and ocean tugs down to small yard craft.

The RCN has three first-line air squadrons, one with Tracker anti-submarine aircraft, one with Banshee all-weather jet fighters armed with Sidewinder air-to-air missiles, and one operating anti-submarine helicopters. Four other squadrons are engaged in training, evaluation and other duties.

Six more destroyer escorts are building in Canadian shipyards and one of these, the *Mackenzie,* is due for completion in October. Also under construction is a 22,000-ton tanker-supply ship, the *Provider*. Modification of St. Laurent class destroyer escorts to carry variable depth sonar and helicopters has begun.

The authorized manpower of the RCN was increased in September 1961 to 22,469 officers and men, including officer cadets, apprentices and wrens. The actual strength on January 1, 1962, was 21,151. More than 51 percent of personnel were serving afloat.

Atlantic Command - Ships Based at Halifax

HMCS *Bonaventure*, aircraft carrier

First Canadian Escort Squadron
(destroyer escorts)

HMCS *Algonquin*	Algonquin class
HMCS *Crescent*	" "
HMCS *Haida*	Tribal "
HMCS *Nootka*	" "
HMCS *Micmac*	" "
HMCS *Cayuga*	" "
HMCS *Athabaskan*	" "

Third Canadian Escort Squadron
(destroyer escorts)

HMCS *Iroquois*	Tribal class
HMCS *Huron*	" "
HMCS *Sioux*	"V" "

Fifth Canadian Escort Squadron
(destroyer escorts)

HMCS *Gatineau*	Restigouche class
HMCS *Restigouche*	" "
HMCS *St. Croix*	" "
HMCS *Kootenay*	" "
HMCS *Terra Nova*	" "
HMCS *Chaudiere*	" "
HMCS *Columbia*	" "

Seventh Canadian Escort Squadron
(frigates)

HMCS *Fort Erie*	Prestonian class
HMCS *New Waterford*	" "
HMCS *Lanark*	" "
HMCS *Outremont*	" "
HMCS *Victoriaville*	" "
HMCS *Inch Arran*	" "

Ninth Canadian Escort Squadron
(frigates)

HMCS *Cap de la Madeleine*	Prestonian class
HMCS *Lauzon*	" "
HMCS *La Hulloise*	" "
HMCS *Swansea*	" "
HMCS *Buckingham*	" "

First Canadian Minesweeping Squadron
(minesweepers)

HMCS *Resolute*	Bay class
HMCS *Chignecto*	" "
HMCS *Fundy*	" "
HMCS *Quinte*	" "
HMCS *Thunder*	" "
HMCS *Chaleur*	" "

Special Duties

HMCS *Cape Scott* Cape class escort maintenance ship
HMCS *Granby* Diving depot ship (converted Bangor M/S)
HMCS *Porte Saint Jean* Porte class gate vessel
HMCS *Loon, Mallard, Cormorant*—Bird class harbour patrol craft.

Sixth Submarine Squadron (RN under RCN operational control)
One or two "A" class submarines

RCN Air Squadrons

VF-870	F2H3 Banshees
VS-880	CS2F-2 Tracker A/S aircraft
VU-32	T-33 Silver Star jet trainers
	CS2F-1 Trackers
	CS2F-2 Trackers
HS-50	HO4S Sikorsky A/S helicopters
HU-21	HTL Bell helicopters
	HO4S Sikorsky helicopters
VX-10	Various aircraft for experimental purposes.

Pacific Command - Ships Based at Esquimalt

Second Canadian Escort Squadron
(destroyer escorts)

HMCS *Ottawa*	St. Laurent class
HMCS *Saguenay*	" " "
HMCS *St. Laurent*	" " "
HMCS *Margaree*	" " "
HMCS *Fraser*	" " "
HMCS *Skeena*	" " "
HMCS *Assiniboine*	" " "

Fourth Canadian Escort Squadron
(frigates)

HMCS *Jonquiere*	Prestonian class
HMCS *Sussexvale*	" "
HMCS *Beacon Hill*	" "
HMCS *Antigonish*	" "
HMCS *Ste Therese*	" "
HMCS *New Glasgow*	" "
HMCS *Stettler*	" "

Second Canadian Minesweeping Squadron
(ninesweepers)

HMCS *Fortune*	Bay class
HMCS *James Bay*	" "
HMCS *Miramichi*	" "
HMCS *Cowichan*	" "

Special Duties

HMCS *Cape Breton* Cape class escort maintenance ship
HMCS *Grilse* Balao class submarine
HMCS *Oriole* training sailing yacht attached to HMCS *Venture*, junior officer training establishment.

RCN Air Squadron (Patricia Bay Airfield, near Victoria)

VU-32	CS2F-1 Tracker anti-submarine aircraft
	HUP helicopters
	T-33 Silver Star jet trainers

Commanding Officer Naval Division - Hamilton

As standard practice, two or three ships of the Atlantic Command are placed under the operational control of the Commanding Officer Naval Divisions to train members of the RCNR during the Great Lakes summer training seasons, along with the small cargo vessel, HMCS *Scatari*. There are two RCNR air squadrons, VC 922, attached to HMCS *Malahat,* Victoria naval division, and VC 920, attached to HMCS *York,* Toronto. They are equipped with Expeditor aircraft.

Barber Pole Sails Again

ONCE AGAIN, a "Barber Pole Brigade" is loose upon the North Atlantic.

The original was a mid-ocean escort force, C-5, whose proud ships wore stripes on their funnels in the Battle of the Atlantic during the Second World War.

The present force consists of seven modern destroyer escorts, five of which took part in a trans-Atlantic training cruise that began March 1 from Halifax and continued for seven weeks.

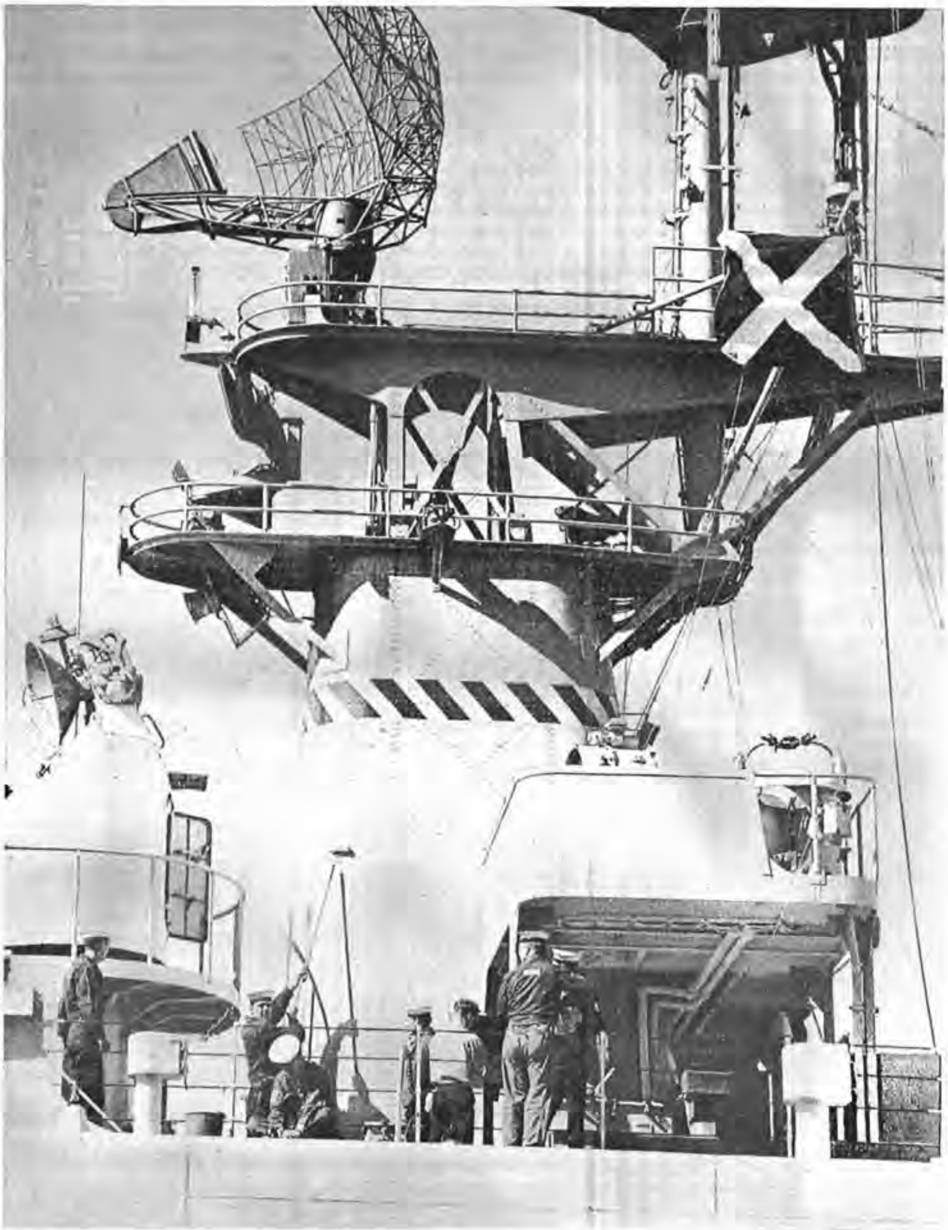
Unity of purpose was strong in the mid-ocean groups of the last war, but nowhere stronger than in C-5. Ships joined the Barber Pole Brigade, did their stint of mid-ocean duty in the longest battle of the war, and left it. But the spirit remained, the Barber Pole legends endure and a song, sung to the tune of "The Road to the Isles", composed by Surgeon Lieutenant W. A. (Tony) Paddon, RCNVR, was duly entered in the pages of naval history.

The C-5 Barber Pole was "stolen" in a sense, from the earlier Task Unit 24.1.13 (dubbed C-3). HMCS *Skeena* produced it sometime in 1942, according to the Naval Historian. Captain of the destroyer was Lt.-Cdr. K. L. Dyer, now rear-admiral and Flag Officer Atlantic Coast. It was adopted by the senior ship, HMCS *Saguenay* (Cdr. D. C. Wallace).

In April 1943, the ocean escort groups were revamped, their American Task Unit numbers discarded and the new designations C-1 to C-5 assigned. In this reorganization, C-5 was created as a brand new group consisting of the *Ottawa, Kootenay, Arvida, Wetaskiwin, Rostern, Dauphin, Kitchener, New Westminster* and HMS *Dianthus*.

Cdr. H. F. Pullen, who retired in 1960 as rear-admiral and Flag Officer Atlantic Coast, was senior officer of this new formation and wished to establish a group spirit as quickly as possible. His destroyer, the *Ottawa*, was originally HMS *Griffon* but, with the change of name to *Ottawa*, a griffon as a symbol was out.

In the new C-5 were HMCS *Wetaskiwin* (ex-C-3) and Lt.-Cdr. Dyer, who now commanded the *Kootenay*. It appears that other old C-3 captains may have been shuffled into the new C-5. So the Barber Pole flourished in C-5 and became naval history. Dr. Paddon's song also said:



The Barber Pole insignia on the lower mast structure of HMCS St. Croix. (HS-67600-72)

"If you know another group in which
you'd sooner spend your hours
You've never sailed beneath the Barber Pole!"

In 1959, the build up of a new post-war fleet caused the formation of a new C-5. The Fifth Canadian Escort Squadron was officially formed on March 2 of that year. One of the units was the *St. Croix*. Harkening back to the war years, her commanding officer, Cdr. K. H. Boggild, proposed that the emblem be re-introduced. The proposition reached favourable ears, for the Flag Officer at Halifax was Rear-Admiral Pullen, the one who adopted the Barber Pole for the old C-5!

A sample produced by Cdr. Boggild in the *St. Croix* received Flag approval for display in all ships of the new squadron. Today, an 18-inch strip of red and white barber pole stripes bands the foremost of these sleek new ships, evoking a multitude of memories of shared adventures on the North Atlantic battle among naval veterans and a source of tradition and inspiration to younger officers and men who now serve in the fleet.

Planned Maintenance

By

Lt. H. R. Percy, RCN.

A NAVY cannot be fully effective unless each ship can be relied upon to do its job at the required time. A ship breakdown in peacetime may cause a great deal of inconvenience, embarrassment and needless expense; in time of war, such a breakdown could result in disaster.

Maintaining warships had always been a great problem and a great expense. Even in the days of sail, when both the problem and the expense were by comparison insignificant, it was not easy to convince treasuries and taxpayers of the need to keep ships for years in costly "idleness" so that they might be ready, perhaps, to justify themselves in "one crowded hour of glorious life." Today, the problem is so complex, and the expense so enormous, that it is no longer permissible to leave anything to chance.

There are two ways of maintaining anything, whether it is a kitchen faucet or an aircraft carrier. The first way is to wait until something goes wrong, and then repair it. This is called *corrective maintenance*. The second way is to try to anticipate breakdowns by carrying out routine inspections and repairs. This is *preventive maintenance*.

Take the faucet as a simple example. By waiting until it leaks, you may get an extra year's service out of the washer. If you are lucky, therefore, the "breakdown" system may be more economical. However, the leakage may score the seating and, instead of replacing a dime washer a few months too soon, you have to buy a new faucet. Nor is that the worst. Not all washers are likely to fail suddenly. Suppose this happens during your vacation, and little Johnnie has left the plug in the basin. You now have to dry out your house, replaster a couple of ceilings, buy a new TV set, and so on. You'll wish you'd renewed that washer.

Corrective maintenance may be satisfactory for your radio set at home, provided you don't mind the inconvenience of being without it for a few days when it goes wrong. This kind of maintenance is less satisfactory for your car. You want your car to be *reliable, safe* and *economical*. For this reason you get it serviced regularly and have certain mechanical checks made from time to time. But, for a modern warship, corrective maintenance is no good at all. If she and her crew are to be in a state of immediate readiness at all times, without making inordinate demands on the national treasury, these factors of reliability, safety and economy must be guaranteed.

Ship maintenance in the Navy has always been planned to some extent. We have tended to follow a policy midway between corrective and preventive maintenance. Maintenance by experience, we might call it. The man responsible for each piece of equipment came to know, in time, how long it might be expected to run without attention and he would evolve a miniature planned maintenance system of his own. And of course there were many routine inspections, regular refits, and periodical overhauls. But there came a day when the poor old maintainer could no longer catch up. He took care of the breakdowns and the more vital inspections, and hoped for the best. As General Orders succinctly put it: "It is not in human nature to leave machinery broken down while other machinery, running well, is stripped for scheduled maintenance."

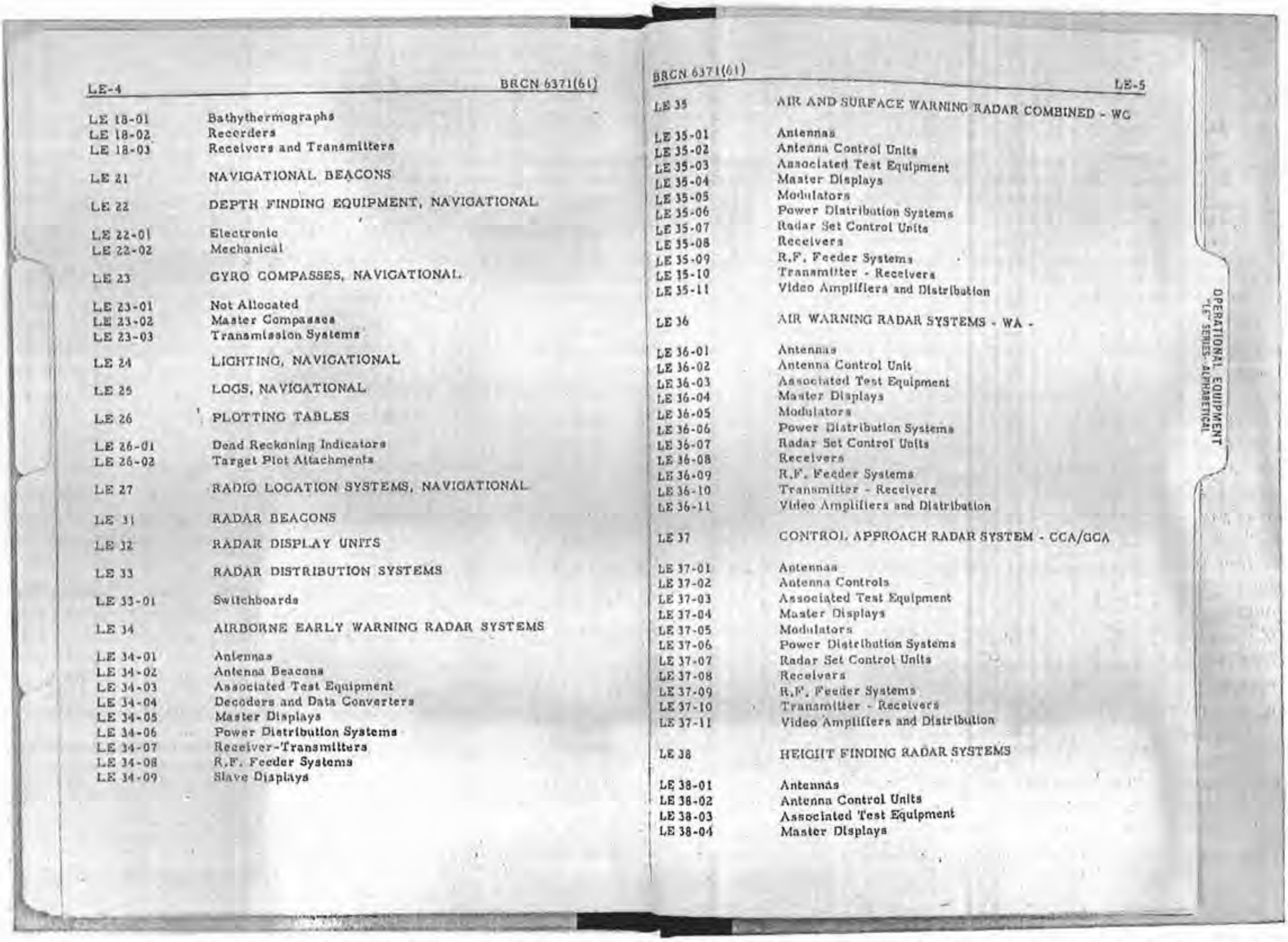
In the old days relatively few skilled tradesmen in a ship took care of maintenance, and no one else gave it much thought. But as the complexity of ships increased and every man's job called for some degree of technical knowledge, it became obvious that complete and careful planning of maintenance was imperative, and that such planning was everybody's business.

The problem was to get fairly started —to gain a long enough respite from defects and breakdowns to get a system of planned maintenance into operation and give it a fair trial. The RCN's extensive program of new construction presented the ideal opportunity and, although there have been many difficulties to be surmounted, many sceptics to convince, and many second thoughts, the RCN Planned Maintenance System has never looked back.

Planned maintenance is good for morale, says the author of the accompanying article. Ord. Sea. John C. Bolt, of Happy Valley, Labrador, emerges from one of the boilers of HMCS St. Croix to report that everything is shipshape and clean as a whistle. (HS-67600-82)

APART FROM the necessary benefits already mentioned — reliability, safety, and economy—planned maintenance offers many advantages.

The most apparent of these is improved operational planning. Early and detailed planning of the Fleet's operational role is not possible unless all ships and their equipment can be



LE-4 BRCN 6371(61)

LE 18-01	Bathythermographs
LE 18-02	Recorders
LE 18-03	Receivers and Transmitters
LE 21	NAVIGATIONAL BEACONS
LE 22	DEPTH FINDING EQUIPMENT, NAVIGATIONAL
LE 22-01	Electronic
LE 22-02	Mechanical
LE 23	GYRO COMPASSES, NAVIGATIONAL
LE 23-01	Not Allocated
LE 23-02	Master Compasses
LE 23-03	Transmission Systems
LE 24	LIGHTING, NAVIGATIONAL
LE 25	LOGS, NAVIGATIONAL
LE 26	PLOTTING TABLES
LE 26-01	Dead Reckoning Indicators
LE 26-02	Target Plot Attachments
LE 27	RADIO LOCATION SYSTEMS, NAVIGATIONAL
LE 31	RADAR BEACONS
LE 32	RADAR DISPLAY UNITS
LE 33	RADAR DISTRIBUTION SYSTEMS
LE 33-01	Switchboards
LE 34	AIRBORNE EARLY WARNING RADAR SYSTEMS
LE 34-01	Antennas
LE 34-02	Antenna Beacons
LE 34-03	Associated Test Equipment
LE 34-04	Decoders and Data Converters
LE 34-05	Master Displays
LE 34-06	Power Distribution Systems
LE 34-07	Receiver-Transmitters
LE 34-08	R.F. Feeder Systems
LE 34-09	Slave Displays

BRCN 6371(61) LE-5

LE 35	AIR AND SURFACE WARNING RADAR COMBINED - WC
LE 35-01	Antennas
LE 35-02	Antenna Control Units
LE 35-03	Associated Test Equipment
LE 35-04	Master Displays
LE 35-05	Modulators
LE 35-06	Power Distribution Systems
LE 35-07	Radar Set Control Units
LE 35-08	Receivers
LE 35-09	R.F. Feeder Systems
LE 35-10	Transmitter - Receivers
LE 35-11	Video Amplifiers and Distribution
LE 36	AIR WARNING RADAR SYSTEMS - WA -
LE 36-01	Antennas
LE 36-02	Antenna Control Unit
LE 36-03	Associated Test Equipment
LE 36-04	Master Displays
LE 36-05	Modulators
LE 36-06	Power Distribution Systems
LE 36-07	Radar Set Control Units
LE 36-08	Receivers
LE 36-09	R.F. Feeder Systems
LE 36-10	Transmitter - Receivers
LE 36-11	Video Amplifiers and Distribution
LE 37	CONTROL APPROACH RADAR SYSTEM - CCA/GCA
LE 37-01	Antennas
LE 37-02	Antenna Controls
LE 37-03	Associated Test Equipment
LE 37-04	Master Displays
LE 37-05	Modulators
LE 37-06	Power Distribution Systems
LE 37-07	Radar Set Control Units
LE 37-08	Receivers
LE 37-09	R.F. Feeder Systems
LE 37-10	Transmitter - Receivers
LE 37-11	Video Amplifiers and Distribution
LE 38	HEIGHT FINDING RADAR SYSTEMS
LE 38-01	Antennas
LE 38-02	Antenna Control Units
LE 38-03	Associated Test Equipment
LE 38-04	Master Displays

OPERATIONAL EQUIPMENT "LE" SERIES- ALPHABETICAL

Two pages from the Ships' Equipment Guide List, which show the coding system that makes it possible to pinpoint items on board ship that require attention. The letters indicate the class of equipment (LE signifies "electronic"), the first group of digits represents the parent equipment and subsequent groups represent components and subcomponents.

counted upon to operate efficently when they are required. The breakdown of one ship can upset the operation, refit, or leave plans of another. With good planning, the maintenance work load can be spread out over the available period; whereas operational breakdowns must be corrected as they occur—seldom at convenient times.

Not so apparent are the beneficial effects of maintenance planning on morale. If you have ever served in a ship with a reputation for being a "wallflower", you know how frequent breakdowns and failures to meet commitments affect the spirit of the ship's company. They create a general feeling of ineffectiveness and frustration, they interfere with leave, and they result in rush jobs and irregular hours of work.

Planned maintenance helps morale in another way: junior men are given responsibility for routine maintenance of certain equipment, and they are able to feel that they have an important part in the efficient running of the ship. Nothing is better for morale than this sort of responsibility and the pride it begets.

Planning and standardization of maintenance make it possible to keep complete and meaningful records; and these records, in turn, become the basis of the system. By analysing them, and by relating the records from various sources, it is possible to detect faults in material on design, poor workmanship, abuse of equipment, and other causes of failure which might otherwise go undiscovered or unexplained. Such analysis also reveals shortages or improper distribution of manpower, weaknesses in logistic support, inadequate training or lack of realism in maintenance schedules.

THE MAGNITUDE of the task of introducing a system of planned maintenance can be imagined when we consider a few of the steps involved. It requires an administrative organization capable of producing schedules for the maintenance of every part of the structure, machinery and equipment of every ship of the RCN. These schedules must be based on a continuing study of the maintenance requirements of every part of every one of these items, and the frequency with which they arise. They must cover everything from minor daily checks of lubrication arrangements, etc., to the lifting of the main turbine rotors and the complete survey of the ship's hull at refit periods.

The organization must provide a system of reports on all aspects of maintenance, and a way of processing, analysing and acting on them. It must give direction to all those concerned in maintenance and keep them fully informed of developments, procedures and techniques. It must have maintenance plans drawn up and promulgated by the time new equipment comes into use. It must make sure that timely and adequate logistic support is forthcoming, in the form of spare parts, materials, special tools and equipment, and so on. And it must ensure that operational and maintenance requirements are integrated with a minimum amount of interference with either.

There are many other demands on the system, and all of them must be met without creating an unrealistic burden of paperwork and without making the organization so top-heavy that there are more people controlling the work than doing it.

Above all, the system must be flexible; it must be organic. With the most efficient planning of maintenance there will still be occasional breakdowns, random failures, and accidental damage. The system must be table to take these in its stride without allowing scheduled maintenance to fall behind. It must be able to adapt itself to all manner of changes. It must not be something rigidly imposed on ship maintenance, it must be an integral part of it, must live and breath with it.

BEFORE we can begin to plan the maintenance of our equipment, we must know precisely what equipment we have. This need is met by *Equipment Lists,* which tell us exactly what machinery is fitted in each ship and give us basic information concerning it. Beside serving as the basis of the maintenance system, this information is invaluable to shore maintenance facilities while ships are away from home port.

It is also desirable to be able to identify a piece of equipment or a component readily in relation to its function and to its parent unit, if it has one. For example, if it is a pump, we need to be able to indicate, without writing down a long description every time, that it is, say, a lubricating oil pump which supplies oil for a main propulsion diesel engine.

For this purpose we have the *RCN Ship's Equipment Guide List,* which groups all the equipment according to its function and identifies it within its group by means of a *generic code.* A machine doing the same job in two ships would have the same code number. This code number is used throughout the maintenance and supply systems to ensure quick and positive reference, indentification, and relation of the item to its job. It should not be confused with the RCN Stock Number.

The key to the whole system in the *Maintenance Schedule* A separate one of these is drawn up for every different piece of equipment. Each schedule is divided into numbered "routines", which are grouped according to the frequency with which they are to be carried out (D—daily, W—Weekly), M —Monthly, 3M—quarterly, etc.)

As experience is gained, an entry is made against each routine, indicating the number of man hours normally required to complete it. This figure, once its reliability is established, is of great significance. It is of value not only to departmental officers in planning the work for any given maintenance period, but to higher authority in the attempt to strike a realistic balance between workload and manpower, in complements planning, and in the allocation of refit and maintenace periods.

CNS 5006 (REV. 60)
NOVCAT 7530-21-502-2107

MONTHLY DEFECT AND MAINTENANCE RETURN

HMCS ....NOSUCH.......... MONTH OF ..December........ 19 .61.

DEPARTMENT .... SHEET NO....1......OF ..1.... SHEETS

A – STATEMENT OF DEFECTS INCURRED FOR CURRENT MONTH, WHICH ARE OUTSTANDING

Serial No. of Defect	Equipment/Structure or System	BRIEF DESCRIPTION OF DEFECT	Ship Staff or Repair Facility	Estimated Manhours
E102/61	Telemotor System	System will not retain pressure during creep rest.	SS	8
H119/61	No. 5 Messdeck	20 sq. ft. of vinyl tile lifted from deck. To be renewed.	RF	4
W73/61	Gunsight MK. 29	Gunsight defective. To be replaced and system re-aligned.	RF	40
W74/61	3"/50 MK. 33	Complete Ordmin 3.26/45	SS	16
LE92/61	TED 3-#7	Blower Motor Bearings burned out	SS	4
LE94/61	Plotting Tables	Complete Cammod #1 in accordance with NGO H366	SS	8
			SECTION A TOTAL	80

B – FORMER DEFECTS STILL OUTSTANDING (Omit defects that are officially deferred)

Serial No.	Estimated Manhours	Serial No.	Estimated Manhours	Serial No.	Estimated Manhours	Serial No.	Estimated Manhours	Serial No.	Estimated Manhours
E60/61	6	H93/61	2	EL56/61	10				
E73/61	24	H99/61	4	EL98/61	6				
E91/61	2	H100/61	2	EL99/61	20				
E93/61	6	H105/61	10	EL101/61	2				
E94/61	5	H111/61	6	W15/61	120				
E97/61	30	H117/61	6	W16/61	6				
E98/61	1	H118/61	4	W17/61	18				
E99/61	2								
							SECTION B TOTAL		292

The above is the form on which ships report defects and maintenance routines completed or still outstanding. The various letters and numbers shown are departmental serial numbers.

WE SAID that the system must be living and flexible. One way in which this is achieved is by encouraging suggestions for the improvement of schedules. Anyone involved in the maintenance of a piece of equipment may make such a suggestion, and it will be given serious consideration. If he thinks a routine is being done too often, thus wasting manpower, or not often enough, thus allowing deterioration, or if he considers the routine inadequate for any other reason, he simply completes a Maintenance Schedule. Amendment Proposal worksheet and submits it to his planned maintenance office.

But how does all this affect the man on the job? Well, when a routine becomes due, a *Maintenance Control card* comes forward in the progressive filing system. Corresponding to this is a *Routine Detail Card,* which is given to the maintainer. He takes this with him to the job, and uses it as a guide in carrying out the routine. On completion, he returns the Routine Detail Card and signs the Control Card, entering the date, the time taken, and any spare parts or materials used.

AS WE SAID, the most efficient planning cannot preclude all defects, and these must be dealt with in an orderly manner as part of the maintenance system.

As soon as a defect is discovered, it is recorded, and filed. When the work can be undertaken, the card is handed to the maintainer responsible for the equipment. He does the work, signs the card, and enters on it any pertinent information.

If the work is not within the capacity of the ship's staff, the information is transferred to a *Work Request on Base or Repair Ship.* This form is sent to the repair facility concerned. If the request is approved, a copy of the form is returned to the ship stating the date on which work will start. A representative of the repair facility visits the ship to discuss and inspect the job. While the work is actually in progress the ship's maintainer, who normally looks after the equipment, is closely associated with the work, and when it is completed he signs to the effect that it has been done to his satisfaction.

THE REPORTING and investigation of failures is an important function of the maintenance system. In the early days of the system, this tended to overburden the administrative organization, since it was felt that there might be something to be learned from any failure, however small. This resulted in more failure reports than ships' staffs had time to prepare, or the analysis unit could cope with.

This problem was solved by attacking it from two angles. Ships were instructed to report only significant or noteworthy failures. A *Repair Parts Usage Report* was then introduced into the supply system. Now, each failure report is considered in comparison with the Usage Report for the part concerned, and any need for investigation at once becomes apparent. The results of these investigations, and the action taken to remedy the causes of failure, are made known in periodical summaries to the Fleet.

This is important. Such reports keep us informed of failures occurring in other ships and tell us what we should do to prevent or minimize them in our own.

THE PLANNED maintenance system thrives on information, on communication. It is useless for Naval Headquarters or Flag Officers to issue directives if there is no way of knowing how they are implemented and to what extent they are effective. The Monthly Defect and Maintenance Return is therefore vital.

This return is intended to indicate to the controlling authorities whether the maintenance effort is keeping up with the work load. If maintenance is falling behind, the return reveals why, and gives the authorities concerned a chance to take corrective action before the problem becomes serious. The return may indicate that the complement is inadequate, that the operational program is too vigorous, that there is a shortage of repair parts, or various other reasons why routines on repairs cannot be progressed.

It will be seen from this that it is in the interest of ships' maintenance personnel to make their monthly returns as truthful and accurate as possible. If the maintenance burden is too great, the return is the way of demonstrating the need for assistance. It is therefore foolish to do a routine "on paper" merely for the sake of appearance.

THE RCN Planned Maintenance System has come a long way. It is being studied with great interest by other navies. Already it has shown marked results in improved operational planning, increased economy and efficiency, better distribution of manpower, improved morale and more systematic training of maintenance personnel.

Problems and difficulties still remain, and will yet arise, but they will be overcome by the same means that have enabled the system to become established and to prosper: by drawing on the experience of the past, by adapting it to meet the pressing needs of the present, and by projecting it with imagination into the future.

The Bridge Builder

By

Lt. Austin Winch, RCNR

BLONDE, vivacious Jennifer Fusedale is a bridge builder.

Not in the usual sense, where muscular males heave gigantic spans of steel across gaping canyons and roaring waters.

But a bridge builder, who is charged with the task of spanning the air waves to connect radio station to radio station in the Royal Canadian Navy's cross-country radio network.

Holding the rate of WLCR3, at Toronto's reserve naval establishment, HMCS *York*, Jennifer can send and receive Morse code at 16 words a minute —no mean accomplishment for a girl who spends only two nights of her week in radio communications.

Jennifer is secretary to the director of personnel for Burroughs Business Machines Ltd., in the company's head office in Toronto. Performing a variety of secretarial duties for the director of personnel, her civilian career involves such things as setting up and maintaining all personnel files and records for the company, posting salary changes and performance ratings, compiling figures for employment and manpower reports and, on occasion, performing preliminary employment interviews.

Jennifer is originally from Saskatoon, where her father is director of finance for the city. A major in the Canadian Army during the Second World War, his natural hope was that his children would find an affinity for the army. His son did, and is now a lieutenant in the active force. However, his two daughters did not. Jennifer's sister, who is a few years older, joined the Navy, and won her commission. Jennifer enrolled at HMCS *Unicorn*, the Saskatoon naval division, in February 1958, which was the soonest date possible after her 18th birthday.

She chose the communications trade because "it appeared to be the most interesting of those available. I found out that I certainly had made the right choice. I have never been disappointed."

Keen was hardly the word for Jennifer. She was chosen "Best New-Entry Wren" for that first training period at *Unicorn*, and when she went to HMCS *Cornwallis* that summer, she won the distinction of being the best wren in her class.

In the two subsequent years at *Unicorn* she was president of the Wrens' Mess twice running—a job she found was most interesting. Like the time she organized her mess to cater for a mess dinner for 50 members of the UNTD cadets from the University of Saskatchewan. "We had to borrow and beg utensils and dishes, cook and serve the food and clean up afterwards. Most of us had little or no experience in this kind of work and we were extremely nervous when we were serving, especially when the cadets were making remarks about our serving manners. But we came through all right. And made some money for our mess and did a good turn for the UNTDs."

After spending two weeks last May at the Communications School in HMCS *Patriot* in Hamilton, Jennifer decided to move from Saskatoon to Toronto. And when she was successful in obtaining a job at Burroughs, she transferred to HMCS *York*.

"I was rather frightened in coming to a large division but the Wrens' Mess was most friendly and I was made to feel right at home," she comments.

Jennifer felt right at home, as well, in the communications branch at *York* and immediately proceeded to work on her next specialty group—group four. "Her winter training is going well," CPO Gordon Spiker, her instructor, says. "She has learned—and much of it by herself—the theoretical portion of the course and will in all likelihood move up to specialty group four this summer."

Chief Spiker, a veteran communicator from the RCNVR before the Second World War, says that Jennifer had to be good to qualify for the responsibilities of a member of the Communications Branch. A strict disciplinarian, Chief Spiker demands that his personnel have a high general ability, be alert and possess an above-average intelligence. They must be speedy, accurate and reliable. And at the same time, he says, they must be methodical, tactful, and must exercise discretion in dealing with classified messages.

He generally describes his branch as the section of *York* possessed with the means whereby messages may be passed to and from and relayed between all authorities with speed, reliability and security. In the communication branch of the reserve there are two trades: Communicator (Radio) (CR): and Teletype (T). The duties in these trades are:

- Preparation, dispatch and reception of messages and signals.
- The logging and recording of messages.
- The distribution and duplication of messages.
- The operation and adjustment of and minor repairs to radio equipment.

More specifically, Chief Spiker says, Communicators (Radio) must be able to operate all types of radio transmitters and receivers. On occasion they must be able to set up and operate mobile radio equipment. Junior personnel are

Here are some moments in the busy life of a young Toronto resident—by day a secretary in a large business firm; on drill nights a radio communicator at HMCS York, the Toronto naval division. Formerly of Saskatoon, Ldg. Wren Jennifer Fusedale has been a member of the RCNR for four years.

mainly operators. Senior personnel must be completely familiar with tuning procedures, wave changing, preventive maintenance and the complexities of naval, air and merchant radio organizations.

Working on her specialty, radio, for the past four years, Jennifer has reached the stage where she is taking courses now to fit her for the responsibility of supervising other communicators. This course is divided into two parts. The first is carried out in *York* during the winter and consists of 25 weeks of training in morse transmitting and receiving, communications instructions and radio organization. The second part is conducted during a period of naval training in the Communication Training Centre, HMCS *Patriot*, and lasts two weeks. By the time Jennifer has reached this phase she must be able to send and receive morse code at the rate of 18 words per minute, and must be able to operate in a voice radio net with proficiency.

Jennifer has been working hard every Wednesday night on her course and also reports on board *York* every Thursday to stand her trick on the Canada-wide radio network. Her job here is to apply her theoretical training by receiving messages from one radio station in Canada, then bridging the radio gap, transmitting to another RCN radio station. By so doing, Jennifer is taking part in the essential radio network spanning the country.

"You could call me a Thursday-night bridge builder—one of the scores throughout Canada," Jennifer comments. "It's a description I'm proud of."

To Catch a Submarine

By

Commodore R. P. Welland,

Assistant Chief of Naval Staff (Air and Warfare)

THE SUBMARINE is militarily worthwhile. If it were not, the great, and not so great, powers would stop building them. The submarine has a future because it has a place to hide, it has great endurance, and it packs a dangerous punch. No other military vehicle in this age combines these qualities. The submarine has an illustrious past, and the betting is that its place is assured for at least the next 20 years.

Long-range submarine can be divided into two broad categories: the conventional, diesel-electric propelled boat, and those propelled by nuclear energy. The nuclear boat differs only in the mode of propulsion, but this is significant even though the fighting equipment may be identical in a "conventional" submarine of similar vintage. Nuclear power permits the submarine to remain fully submerged and to maintain high speed to the limit of her crew's endurance; and it gives the ability to surpass in speed most surface ships, especially in rough weather conditions. The diesel-electric boat must surface to re-charge batteries; moreover, it lacks endurance when submerged.

A modern Soviet diesel-electric boat can sail from North Russia, transit the Atlantic to the Canadian Eastern seaboard, remain on station up to 30 days, and return without refuelling. During this patrol, which could occupy three months, nothing larger than the diesel "snort" head (the size of a good fence post) need be above the surface, and this for but brief periods. On board such a submarine there may be torpedoes enough to sink 20 or more ships, mines sufficient to cause havoc in several harbour approaches, missiles with the capability of damaging more than one city—a combination of weapons is popular in the trade. The armament of a nuclear boat is likely to be similar but she can stay on station longer and probably has a better chance of survival in the face of attack.

In order to survive, the submarine commander must avoid being found. To avoid detection by radar, he must deny himself the luxury of appearing on the surface; to prevent having his position fixed by radio-direction-finding he should not transmit on his own radio or radar; to dodge detection by under water acoustics he must not make noise. The silent world in which he lives creates its own problems: the knowledge he has of opposing forces is limited to what he can see through a periscope, or hear through his own radio and sound intercept equipment. These means will frequently be enough for the submarine commander's purpose, but are inhibiting factors to his success.

The experienced submarine hunter will aim to exploit the weaknesses of his quarry. The submarine must be denied the surface in order to aggravate his built-in myopia; his radio and radar transmissions must be intercepted and cross-fixed; the underwater noises he makes must be heard and translated into meaningful terms. When located, he must be dispatched quickly, before a like fate overtakes his pursuer.

The RCN's submarine Grilse from the air. (E-62074)

THE METHODS available to detect a submerged submarine are limited in scope and number. The magnetism of the submarine's hull is detectable to airborne magnetic anomaly detectors, instruments that detect variations from the normal in the earth's magnetic field; the ranges achievable are short, however—a few hundreds of yards—and the aircraft must almost ruffle the water for best results, a neat and skillful trick on a dark night. The noise made by the submarine may be detected, but an alerted submarine need make no detectable noise. Indeed, submarine designers regard the silence of machinery operation as a vital survival factor.

Armatures are perfectly balanced, shafts passing through glands do not squeak or vibrate, valves operate silently, propellers are designed not to cavitate, the external shape is smooth to reduce rush noise. The hunter depending on the submarine making a detectable noise is unlikely to get his name gazetted; more probably he will appear in the obituaries.

To achieve detection of a silenced submarine the hunter must make the noise—a series of noises using sonar. Sound generated at certain frequencies will travel great distances through the water. If this sound is pulsed, and if the pulse strikes the submarine's hull, the echo returning can be detected in the ship or helicopter and translated into a range and bearing. A high degree of accuracy can be achieved over several miles, sufficiently so to place a packet of explosive in the shape of a torpedo or mortar bomb near the target.

But what is sauce for the hunter is sauce for the hunted, and sound is the sauce of underwater warfare. Although the submarine may be detected he is almost certain to know he has been detected, because he also hears the sonar pulse. Either avoiding action or hostile action on his part is the ensuing result; either way the hunter's problems will increase immediately. And nature tends to favour the submarine.

The sea to sonar is not the reliable medium space is to radar. A well-tuned radar will detect an aircraft through fog, heat or rain with great dependability to ranges of a hundred or

The helicopter is regarded as having many advantages as an anti-submarine weapon. It can outspeed any type of submarine, carry out a sonar search and attack with homing torpedoes. (DNS-24081)

more miles. Sonar will detect a submarine, but the ranges are not radar ranges and the reliability factor is lacking, as other things in the sea return echoes, some as solid and musical as those bouncing off a smooth steel hull. Temperature and salinity layers bend the sound beam as a prism does light; the pulse that rippled out from the underwater transmitter may in a second be arcing down to depths no submarine has yet contemplated. These aberrations are predictable, but nothing straightens the beam and the result can be "no echoes".

The submariner can also analyse the sound-speed anomalies caused by non-homogenous water, only in his case they can be used to avoid detection through his manoeuvering the boat above, below or into the refracting layer. Here he may rest, perhaps somewhat nervously, assuming that he is immune. Often he will be.

IN RECENT YEARS, and due in considerable part to Canadian ingenuity, the surface ship problems created by near-surface layering effects have approached solution. By placing the sonar transmitter at the end of a long cable, and towing it at the optimum depth, considerable initiative has been regained. The submariner may still retire into the layers, but with added apprehension. Helicopter-borne sonar dangling far down into the sea also achieves encouraging results.

Many other problems, not all within foreseeable solution, beset the hunter, and again nature seems to smile on his deep-running quarry. The act of submerging below 100 or so feet calms the environment. The boat does not roll, pitch or yaw. There is no reason for the crew to be seasick, or exhausted by simply trying to preserve a normal stance. All is quiet. The submarine commander being pursued may steer an evasive course so as to force his tormentor to stem the sea, and then listen to the pounding of the ship endeavouring to overtake. If the submarine is nuclear propelled the odds are that in all but calm weather the hunter will have real difficulty in overtaking. High winds also affect aircraft adversely, whether they be fixed or rotary wing.

A further automatic advantage gained by submerging is the elimination of propeller cavitation. Below a few hundred feet propellers that were noisy near the surface become silent: the high water pressures prevent the formation of minute gas bubbles which are the cause of much propeller-generated noise. A submarine at 400 feet may be silent at 15 knots, whereas the hunting destroyer of equally sophisticated design is probably detectable at 10 miles through her own cavitation noise, and moreover, quite unable to prevent it, except by reducing speed. This is one of the phenomena that enable submariners to hear surface shipping at ranges quite unfair to the defenders.

In the matter of submarine-killing weaponry, the development of homing torpedoes of increasing intelligence confers reasonable kill probabilities to both aircraft and surface ships. The odds, however, are more or less equalized by the fact that similar torpedoes are available to submarines, and will home onto a ship. Aircraft are as yet immune to submarine-launched weapons, although this may not always be so. Nuclear depth charges are reported to be feasible. These weapons should achieve by brute force what very clever electronics can probably accomplish in a homing torpedo. Nuclear weapons are unlikely ever to be regarded as an ultimate weapon in submarine hunting, as even the largest can have but a few thousand yards' lethal range on a submarine. Moreover, the fallout will not be an underwater hazard, and the sea will repair itself in a few minutes.

The real trick is, and will be, to find the rabbit.

There is little that a submarine can do that cannot be done cheaper by other means—providing there is no opposition. Surface ships and aircraft can sink shipping, lay mines, land agents and fire missiles; but their chances of survival while so doing, on or near an enemy's doorstep, are becoming slim indeed. The submarine assures its future owing to the difficulties inherent in locating it in the big ocean, or for that matter in quite restricted and shallow waters.

MUCH, however, can be done, but it cannot be done quickly, as real progress in solving the fundamental problems lies in the realm of both pure and applied research. There are great gaps in our knowledge: the nature of the sea itself, its peculiar effect on sound waves, its apparent near-impenetrability to electromagnetic waves, the ocean currents, the bottom topography. Knowledge of the earth's magnetic field is incomplete, hydrodynamics require progression, more reliable electronic equipment is needed, better materials for use in sea water are vital in some applications, This is a condensed list. There is the more obvious but perhaps none-the-less difficult task of developing improved vehicles: aircraft that are much more versatile, are not compromised when the weather cuts up, and do not exhaust the crew; ships that are less expensive, more seaworthy, and less immune to counter-attack.

Many of the foregoing areas of endeavour are being pursued energetically in Canada and elsewhere. The advantage in pooling ideas and resources is recognized. The chances of achieving decisive success are, however, not immediate. It is wrong to assume that an attacking submariner would be assured of returning to his base, but it would be less than realistic to suppose that he would not have a chance of surviving several patrols.

Submarines are expensive vehicles, but this is no deterrent to believers. The scoreboard accompanying this article is indicative.

A complete list of countries possessing submarines shows that they are more widespread geographically than are jet bombers, for example, or heavy tanks. This fact is perhaps of some interest to the future organizers of such events as United Nations sponsored military expeditions, and no doubt to the participants, dependent on shipping, as surely they would be.

Naval planners have often contemplated the introduction of submarines into a "small war". The ownership of an aggressive submarine under such circumstances may be most difficult to determine, more so then was, for example, that of the "volunteers" introduced into the Korean war. Direct identification of a submarine can be either inconclusive or illegal or both, which makes the possibilities interesting. Submarine are usually thought of as weapons of major war; this is not necessarily so.

In the last two large wars enemy submarines played a prominent part. On each occasion they were brought under control by a combination of scientific advance and the sheer weight of numbers of the anti-submarine forces. Convoys being the main target, the defenders had but to ensure that no submarine got within about five miles of any ship. A moving rectangle of ocean of some 150 square miles had to be kept "sanitized". This proved on many occasions to be impossible.

World Distribution of Submarines

NATO Countries	Conventional	Nuclear	Nuclear Building	Communist Bloc	Conventional	Nuclear	Nuclear Building	Other Countries	Conventional
Britain	44	1	1	Bulgaria	3	—	—	Argentina	2
Canada	1	—	—	China	25	—	—	Brazil	2
Denmark	3	—	—	N. Korea	2	—	—	Chile	1
France	22	—	1	Poland	9	—	—	Indonesia	2
W. Germany	3	—	—	Roumania	12	—	—	Israel	2
Greece	2	—	—	U.S.S.R.	430	6	4	Japan	2
Italy	6	—	—					Peru	4
Netherlands	6	—	—					Spain	9
Norway	8	—	—					Sweden	23
Portugal	3	—	—					Egypt	9
Turkey	10	—	—					Yugoslavia	2
U.S.A.	156	23	15						
Totals	264	24	17		481	6	4		58

(Source: "Janes Fighing Ships")

Nevertheless, the problem was finite and in due course was solved. Toward the end of the Second World War it was, in fact, solved to the point where west-bound Atlantic convoys in ballast were sometimes deliberately routed through submarine concentrations, this in order that the escorts could force attrition on the U-boats. (The sporting aspect of these operations was not apparent to the veterans of the single-ship combat days of the 1940-41 period).

The recent marrying of missiles to submarines has complicated the hunter's problem by several orders of magnitude. To defend a point target against a submarine with a missile capable of 100 miles range means searching an area of 30,000 square miles. If the missile range is boosted to 200 miles, the dangerous area becomes 120,000 square miles. Destroying the missile in flight seems even more complicated than finding the launcher.

THE MAIN PROBLEM apparent in submarine search operations is where to begin. There are a number of choices: Off enemy ports of egress? This has always been a favourite in naval warfare and has frequently paid large dividends. But the only anti-submarine vehicle that could hope to survive on the enemy's doorstep would be another submarine. Indeed, it is the only vehicle that has the endurance needed for trans-oceanic passage followed by the necessary extended vigil. The advantages of nuclear propulsion are evident in this case. A second place in which to search is in the vicinity of the target: the convoy defence technique. Against missile-fires "vicinity" may mean a radius of 100 or more miles. Quite obviously very large ocean areas are involved and the defenders may be forced to spread themselves too thinly to expect telling results. A third place is in areas where the probability of the submarine passing is high. There are a few such places, as a glance at a map shows. This is a kind of Dew Line—Mid Canada Line approach to the problem. It could even be successful were submarine detective devices as capable of achieving results as is a line of radar stations. If comparable results were attainable the submarine's future would be as debatable as that of the bomber.

If underwater detection devices can achieve only relatively short ranges, an apparent solution is to have a lot of these detectors in areas of probabiltiy. The difficulty in this approach, so far, has been the cost of each unit. Moreover, achieving detection does not solve the problem. The end object is destruction, and submarines are hard-shelled animals and as cunning as their captains. Simple effective vehicles have not evolved; on the contrary, patrol aircraft have cost $10,000,000, destroyer escorts $25,000,000, anti-submarine submarines $20,000,000. The policemen, in fact, are as "expensive" as the thieves, must be at least equally armed, and quite obviously should be far more numerous.

Much, however, can and is being done toward advancing the anti-submarine art. Close liaison between submarine hunters and scientific officers furthers the knowledge of each group. This results in effort being directed toward agreed objectives: Assistance in solving engineering difficulties can be sought throughout appropriate industrial circles; designs can be improved upon, reliability assured, maintenance effort reduced. Within the Navy itself much can be achieved through the attainment of personal excellence in operating the complex machines, and in caring for them; the tactical skill of officers can be advanced through rigorous training in all weather and climatic conditions. Much is to be learned by all anti-submarine people through close association, both at sea and ashore, with submarine people. Indeed, the frequent exercising of ships and aircraft against submarines is essential. This involves having target submarines as training aids. These same submarines can and should double as part of the anti-submarine force. In each case high performance boats are necessary.

THE PERSONAL problems that have to be faced by the various unit commanders in an anti-submarine action perhaps point up some of the practical difficulties experienced at sea. Imagine the captain of a hostile missile-firing submarine, approaching a shore target at which he intends to fire missiles having a range of 200 miles. Assume he is now 800 miles from the target. His immediate aim is to avoid detection, but he must also keep his batteries well charged. This is essential if he is to hope to escape destruction if discovered. He is prepared to take three days to run the last 600 miles.

The enemy submarine commander orders the boat to periscope depth. He believes it safe as he has heard no shipping in his hydrophones. He does not know about aircraft but he must find out. He orders the radar intercept mast extended in order to detect the pulsing of any airborne search radar. His operator hears nothing. He now extends the optical periscope and scans the water horizon. No ship is in sight. He orders the snort mast up; the diesels are started, and while the boat proceeds at a few knots the diesel-driven generators ram amperes back into the propulsion batteries.

The radar operator reports an intercept. The captain immediately orders the diesels shut down, and charging ceases. He knows that his operator will have spotted the approaching radar at about double the range at which the aircraft radar will detect him. Now running on battery, he keeps the intercept mast and optical periscopes up, hoping for a better bearing and perhaps even a visual sighting. The radar may only be from a passing civil airliner. The minutes drag by, the pulses get stronger. He orders the intercept mast down, and now only a two-inch diameter periscope shows above the sea. Through the periscape, low on the horizon he sees and identifies a submarine-hunting naval Tracker approaching. He orders the boat deep and silent.

Now he is blind, but he can make the safe assumption that an aircraft carrier is within several hundred miles, and he can reflect on whether the Tracker approached by accident or through knowledge of some sort, and he can wonder about the inevitable destroyer escorts.

An hour later he goes through the cautious act of coming to periscope depth again. All is clear. The Tracker had simply stumbled into the area, and made no detection. His batteries are now further down, and the recharging is started again. His final success now depends on evasion, and this may well depend on how well a radar-intercept gadget works, or how vigilant a sonar operator is. A few hours and several thousand precious amperes later, the sonar intercept reports a "ping". Charging stops at once, and all attention is given to the probability that a pulse of sound, above the frequency a human ear can detect, passed the boat at 5,000 feet per second. This, translated, means a hunting destroyer or submarine is within ten or so miles. Again the defensive plunge and utter silence, with the possibility of detection followed by the choice to fight or to evade. To be discovered, no matter the result, would compromise the mission, so evasion will be the captain's choice if the choice lies with him. A single mistake cannot be risked. Three days of this will be enough for any man.

TO THE HUNTERS in the ships and aircraft the problems are not dissimilar. An odd signal on a strange frequency may mean "submarine". A stylus fluctuating across the graph-paper of the magnetic detector could be one too. A fleeting radar echo could be a periscope having a last quick look, but could also be a sea bird flapping on takeoff. A returning sonar ping means "submarine". It can also mean a pair of whales, a tidal eddy, a shoal of pollack.

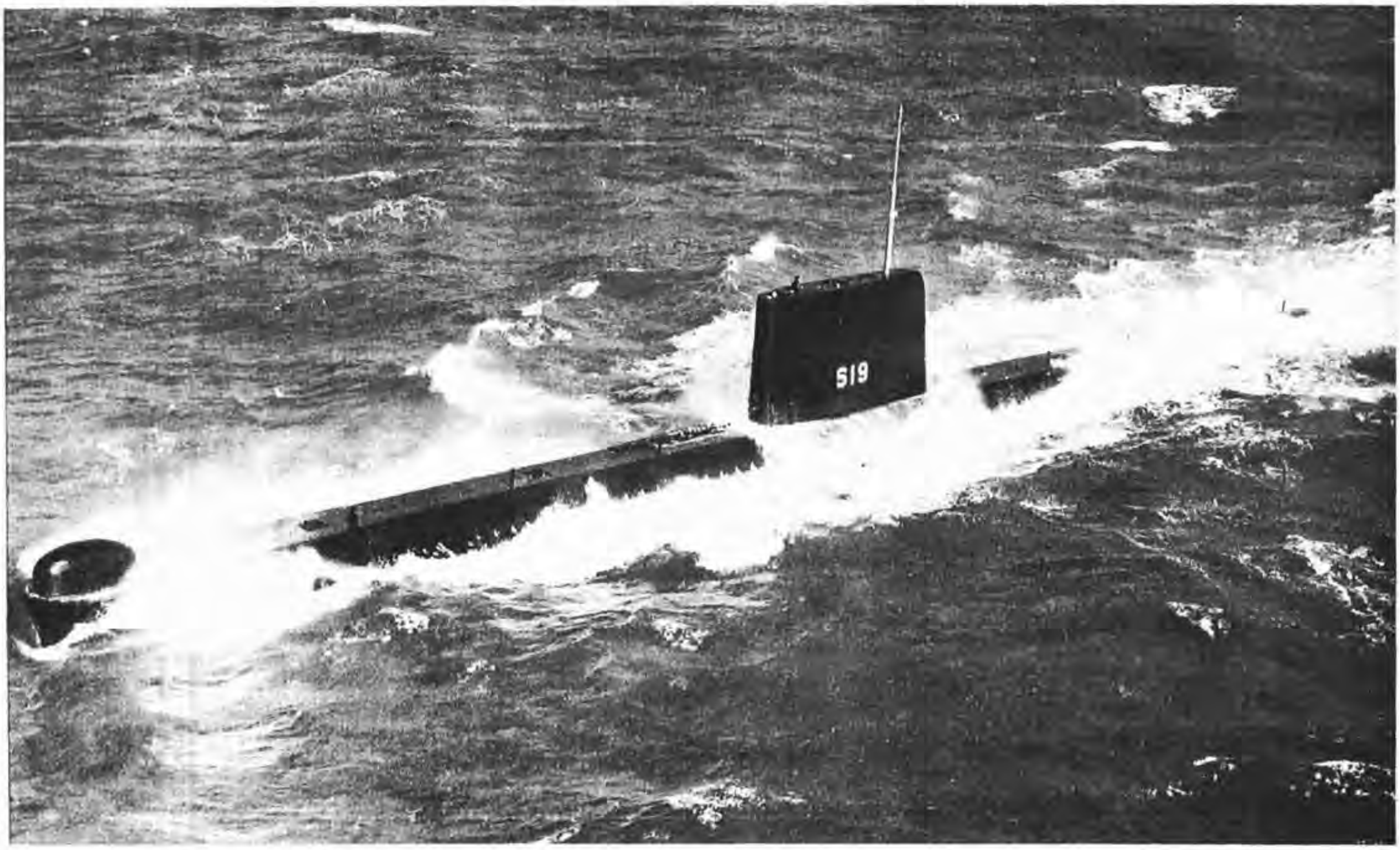
The knobbly business of making innumerable decisions teases the patience and tries the mettle of the hunter and the hunted. The information available for making these decisions by the respective captains is almost always second hand and given usually by a person of less experience, the scope of whose imagination is more or less unknown. A further nagging aspect is the frequent denial of second "looks". It is perhaps because of the tenuous nature of the information in underwater warfare that some credence is given to the power commonly called "intuition", although the word will not appear in any syllabus.

I remember a destroyer captain being questioned, I think in 1943, as to why he had altered course to port at a particular point in a submarine hunt. It was this turn that regained sonar contact and subsequently resulted in a sinking. "Because it would stop the funnel smoke blowing across the bridge," he had answered.

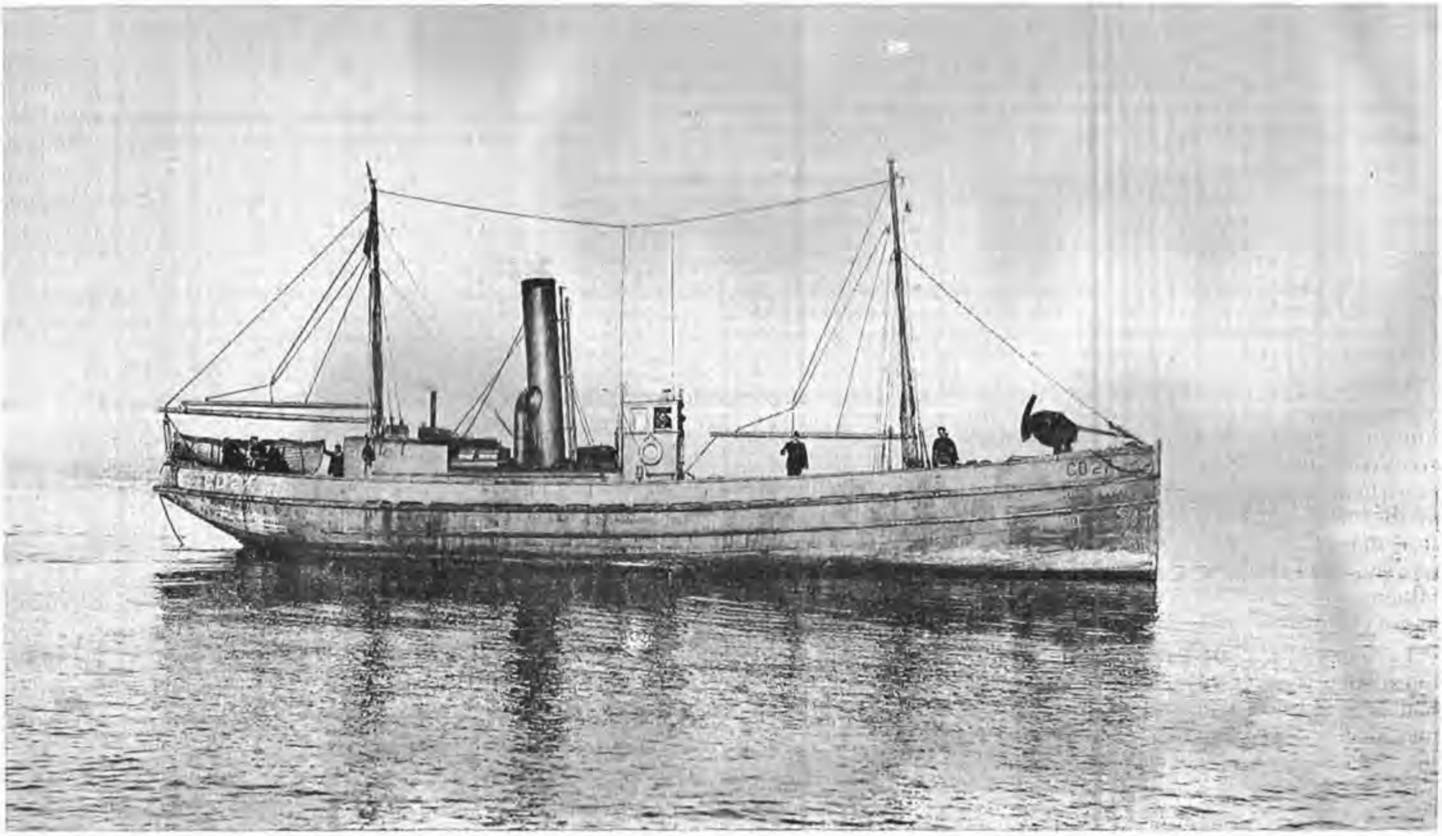
There is much advice available on how to solve the anti-submarine problem. Between those who advocate "Let's get a breakthrough" and those who say, "Only submarines can sink submarines," or "only airplanes can" or "only destroyers", there is a sensible course. No reputable scientist believes in a "breakthrough". Anti-submarine submarines alone will not solve the problem either, the reasons being that these ships, marvellous in some roles, are not yet adapted to others, like escorting a gaggle of fast tankers for example, or looking after the daily needs of a large convoy, or of launching search aircraft. The "only airplanes" idea is equally hollow. Aircraft with even 24 hours' endurance, but based miles from the scene of operations, are likely soon to become fatigued when hunting submarines with 90 days' endurance, and particularly if they do not know where to begin looking. To use "only ships" is to deny the hunter the aircraft's ability to scout the sea about him rapidly over a radius of hundreds of miles. A combination of arms is needed if the submariner's life is to be made miserable and dangerous. And it can be.

In our anti-submarine forces, submarines are needed in order to meet the threat of intrusion, and to do it in the event, and they are essential to train our other anti-submarine elements. Carrier aircraft are needed with their ability to appear, with full logistic support, in any part of the world's oceans, unheralded and ready to operate. Long-range patrol aircraft, with their great endurance and real advantage of relative comfort for the crew, are an important adjunct. Submarine-hunting surface ships with the great endurance of the destroyer-escort type are needed in order to put the big sonars into the water and to carry the lethality necessary. Helicopters on board these ships are needed to extend by many miles the ship's sonar and general search ability. Research is needed, and it must have the end aim of producing for the fleet better vehicles, better detection devices, and more lethal weapons. There is a pressing need to find the means of putting enough "policemen" into the search areas to catch the relatively few, but very dangerous, felons.

Catch a submarine? Certainly. But it is difficult.



This is HMS Oberon, name-ship of the latest class of conventionally-powered submarines being built in Britain. The Oberon class submarines, of which two are in commission and another nine under construction, are fitted with the most modern detection equipment, are armed with homing torpedoes and are capable of high underwater speeds. They can maintain continuous submerged patrols in any part of the world. (Admiralty Photograph; Crown Copyright)



Hundreds of Canadians, members of the RNCVR, served on coastal patrol duties in Canadian-built drifters, of the type shown here. The little ships, the first known to have worn the now familiar maple leaf on their funnels, patrolled coastal waters of Britain and off Gibraltar and the western bulge of Africa.

The Days of the RNCVR

by

Lt (SB) Peter Ward, RCNR

AT 3 A.M. on a frigid January morning in 1916, a train pulled into Halifax station with 18 young would-be sailors aboard. They were the first Torontonians to serve Canada in the Overseas Division of the Royal Naval Canadian Volunteer Reserve.

There wasn't a soul in the station to meet them. It was snowing hard as the cars ground to a halt and the thermometer registered well below freezing.

During their ride from Toronto, they had come through one of the year's worst blizzards. At one point their train was isolated by drifts for 12 hours. There was no diner, so they appeased their hunger, during the wait for a snow-plow, on canned sardines and crackers, purchased from a white-coated vendor.

They were hungry, as well as cold, when they stepped stiffly onto the platform at Halifax. The wind was a real nose-nipper, biting as only a Halifax January wind can be.

In charge of the small group was Gordon B. Jackson, a young lawyer from Toronto who, with the others, had answered the British appeal for Canadian volunteers to serve with the fleet auxiliary overseas. Jackson was an ordinary seaman, like the rest, but he had been placed in charge before they left Toronto.

At the station he looked around and spotted an all-night restaurant. He led the way to its warmth and the chilled men revelled in hot coffee and ham and eggs.

Hunger appeased, and temporarily warm, the group asked directions to the main naval jetty and headed there to join their ship, HMCS *Niobe*, as ordered. At the jetty, as Jackson recalls it, they drew a blank.

"First boat in the morning at 7 a.m.," they were told.

Back to the restaurant they went, and dawdled over more coffee till a few minutes to boat time.

At the stroke of seven, the *Niobe's* boat pulled out of the darkness. The chilled 18 piled in and officially joined His Majesty's Royal Canadian Navy;

On board the *Niobe* they were hustled below; then, before they had a chance to stow their dunnage, a petty officer shooed them out on deck.

Imagine swabbing a cruiser's decks with pants rolled to the knees and water sloshing around your bare toes in January, with a sea breeze coming down the Halifax approaches! What an introduction to the navy!

But things got better. Within two weeks the 18 from Toronto were joined by others pouring into Halifax from every part of Canada, all eager to join the auxiliary overseas. Two weeks after that cold early morning introduction into the navy, they were on transport headed for Plymouth.

For a year the Canadians of the Royal Naval Canadian Volunteer Reserve served in a variety of drifters, fishing boats and trawlers, sweeping clear the shipping lanes of the North Sea, English Channel and western approaches. There were 1,700 men attached to the RNCVR overseas division.

In 1917, Gordon Jackson was granted a commission in the RNVR. He was the first man of the overseas contingent to rise from the ranks. There were no officers, not even any non-commissioned ranks, in Overseas Division of the RCNVR. Everyone was an ordinary seaman.

To change his square rig for round, Jackson had to be discharged from the RNCVR and join the RNVR. CVR men received a basic kit issue in Canada, but their sea gear, needed so badly in the small ships they manned, came from RN stores. Canada had made no provision for supplying them.

With his commission, Sub-Lt. Jackson served for a short time aboard an RN destroyer. He was ordered to report ashore almost immediately.

"Jackson, what about these Canadians?" demanded one of the squadron of brass facing the young Sub.

With no wasted words, the staff officers informed Sub-Lt. Jackson he was to take command of the RNCVR as a division in Devonport. In groups of 200, all the Canadians were to be processed through Devonport and up-rated by Sub-Lt. Jackson as they warranted. A great number of the CVRs were fishermen and professional sailors from the Great Lakes—men well equipped to serve in the small fleet auxiliaries. Some of them were more experienced in command than the RNVR officers and chiefs they served under.

When Sub-Lt. Jackson arrived at Devonport, the base commodore said to him: "You're to command a division, Jackson? What are you doing as a 'sub'? We can't have a 'sub' commanding a division here."

Within two weeks Jackson's promotion to lieutenant came through.

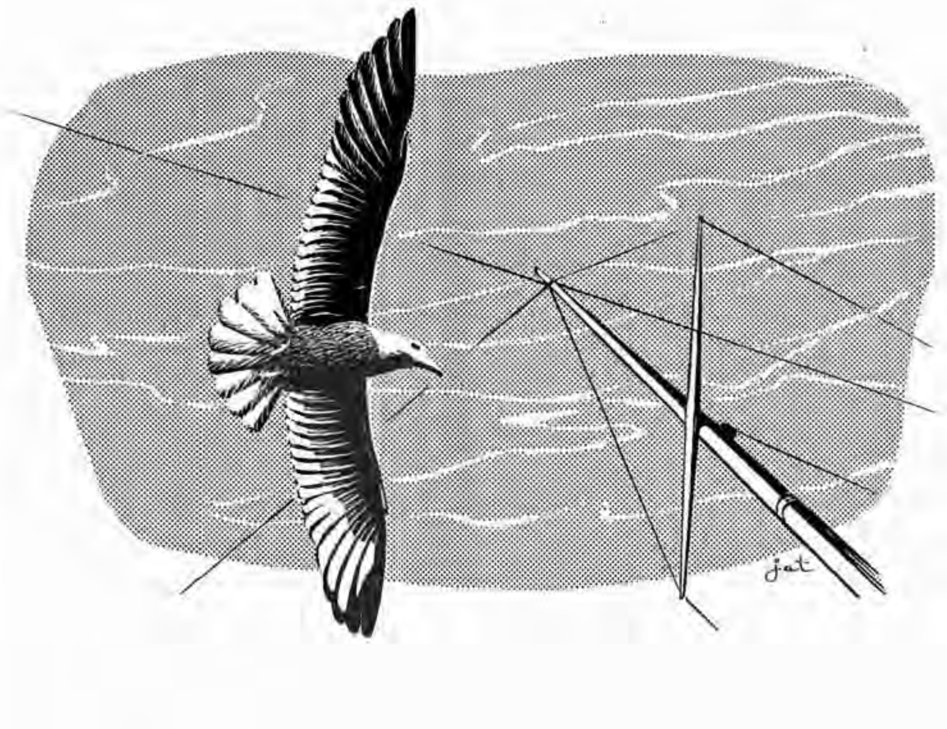
"We had quite a time at Devonport," recalls Mr. Jackson. "I wanted to go to sea, but they told me: 'You ought to know by now that you do what you're told, not what you want,' and there it was.

"Those RNCVR boys won Canada a good name. Their record was a good one. We won the respect of the RN and that takes some doing."

As the Canadians arrived at Devonport, Lt. Jackson began sending through his promotion recommendations. The base commodore was doubtful about a mere lieutenant obtaining commissions for his men and, when they came back within a week or so approved, he took Jackson aside and playfully asked him to recommend promotion to rear-admiral for himself.

"I remember one man we called 'Tiny'," said Mr. Jackson. He weighed about 360 pounds. The first ship we sent him to was a small drifter and Tiny got stuck in the forward hatch. They had to winch him out with the capstan. We had an awful time finding a ship that would fit him."

Some of Jackson's men arrived at Devonport from the trawlers in a weird assortment of catch-all clothing. They'd wear anything to keep themselves warm and grey Persian lamb caps seemed to be particularly popular. Where the men got them, Jackson never discovered, but the natty fur headgear was prevalent enough to earn Lt. Jackson the nickname, "Admiral of the Russian Navy," among the other officers at the base.



One group of Lt. Jackson's men formed their own flotilla and took six drifters to Sierra Leone, where they served with distinction till the end of the First World War.

Although the Canadians were uprated at Devonport, there were never any commissions in the Overseas Division of the RNCVR. All told, eight Canadians left the CVRs to take commissions in the RNVR, but to do so they had to take a cut in pay.

"I served in the Channel for a year before I was commissioned," said Mr. Jackson. "We were sweeping for convoys to France. In all that time I never saw a German, but we saw plenty of damage. My mates were blown up before my eyes on more than one occasion."

Trial of the trawlers in the "Big War" was the hydrostatic bomb, a device that floated free about 14 feet beneath the surface. It had no mooring line for a sweeper's paravanes to cut, and was too deep to be touched off by the shallow-draught trawlers. The hydrostatics were at just the right depth to be hit and exploded by the merchantmen, following the trawlers in the war channel, supposedly swept free of mines.

To lick the hydrostatic, trawlers used their huge fishing nets, caught the submerged mines like cod, then exploded their deadly catch where it would do no damage.

When the last gun had been fired and the First World War was over, Lt. Jackson began arranging transport home for his Canadians. Rather than wait for one ship which could take them all, he worked his men into small spaces left over in ships already assigned to army units.

"We got them home much faster that way," he said. "Lord knows how long we would have waited to get a ship to ourselves."

By June 15, 1920, the last RNCVR man had traded his uniform for civvies. Once again there was no reserve money in Canada.

Perhaps the Navy can thank low postwar defence spending by the government for the rebirth of a naval reserve in Canada. In 1923 the Navy's budget was so low there was scarcely enough money to keep one warship in operation.

Commodore Walter Hose was then Director of Naval Service and he decided the little money available could be best spent in organizing a reserve force for the RCN. Within a few months of the beginning of 1923 both the RCNR and the RCNVR were formed. The RCNR was to be allowed 70 officers and 430 men. There were to be 70 officers and 930 men in the RCNVR. Most of the RCNR men were professional sailors by trade.

For the RCNVR, the call went across Canada to those who had served during 1914-18 with the Navy. Companies and half companies were to be formed in Calgary, Charlottetown, Edmonton, Halifax, Hamilton, Montreal, Ottawa, Quebec, Regina, Saint John, Saskatoon, Vancouver, Winnipeg and Toronto.

Gordon Jackson, now busy again with his legal career, heard from Ottawa early in 1923. He was asked to form the Toronto Company, RCNVR, and take command.

Lawyer Jackson opened for business as a naval officer again two nights a week in the basement of a store on King Street. Before the year was out, the Toronto Half Company, as it was called, had a full complement of 75 officers and men, the maximum authorized. Another 30 or 40 men came down regularly, even though they couldn't be accredited, and attended drills without either uniforms or pay.

"The men were paid 25 cents a drill in those days," said Mr. Jackson. "The officers—we served for the love of it. We didn't get a penny".

The Toronto Half Company, RCNVR, marched in the city's garrison parade for the first time in 1924. Lt.-Cdr. Jackson with his two-and-a-half wavy stripes, formed his small navy-blue crew up at the head of the parade and inspected them to make sure they were up to navy smartness.

"Here there, what's this?" demanded a red-faced army officer, the adjutant. "You fellows move back to the rear."

"Tell your commanding officer that you obviously don't know about the rights of the senior service to lead a parade", said Lt.-Cdr. Jackson. "When he's ready, we will begin."

The adjutant left mumbling: "We'll see about that", but he never returned. It was, in Mr. Jackson's own words, "a pip-squeak naval officer that gave the command to start the parade." The RCNVR led off.

Lt.-Cdr. Jackson stayed as CO of the Toronto Company for four years. Before he retired, the unit moved to new quarters in the Navy League Building on Lakeshore Road, where they stayed until during the Second World War.

During the late '20s and '30s the RCNVR grew in Toronto and in every other unit. By the time war broke out in 1939, units in London, Kingston, Port Arthur, and Prince Rupert had been added to the original number. Two new types of reservists had also been created, the Fisherman's Reserve and the Supplementary Reserve.

The whole reserve force was called up September 1, 1939, and Canada declared war September 10.

There were approximately 2,000 men in the RCN, and 2,000 more in the reserve forces. Most of the men who enlisted after September 1 did so in the RCNVR and by January 1941, when there were 15,000 men in the Royal Canadian Navy, 8,000 of them were VRs.

More than 100,000 Canadians joined the Navy during the Second World War and served in every theatre of war. High point of enrolment was late 1944, when there were 95,705 in Canadian navy blue, 80,055 of them RCNVRs and 5,485 RCNRs. These figures do not include 5,851 women in the Women's Royal Canadian Naval Service, formed in 1942.

In 1943 the University Naval Training Division was organized in 15 universities, and 554 officers and men of the UNTD served during the Second World War.

In the closing years of the war, Canadian warships, manned chiefly by reservists, carried the bulk of the convoy load in the North Atlantic. By 1945 there were 400 fighting ships qualified to wear the maple leaf on their funnels. Canadians manned their own ships and served with distinction in ships of the RN, too.

A reservist won the only Canadian naval Victoria Cross during the Second World War. He was Lt. Robert Hampton Gray, DSC, RCNVR, who sank a Japanese destroyer by crashing his damaged aircraft into the ship. He was serving with the RN carrier HMS *Formidable*.

Gordon Jackson received his call from Ottawa early in the war, but he felt his years would prevent him from being valuable to the RCNVR in an active role. Instead he agreed to put on his uniform again and instruct at the Toronto naval division, then located in the Automotive Building at the Canadian National Exhibition grounds. Three nights a week Lt.-Cdr. Jackson instructed in seamanship, navigation and other subjects, passing on the skills he learned in the First World War.

At the close of hostilities in 1945, many reservists transferred to the RCN. In 1946 both the RCNVR and the RCNR were combined to form the Royal Canadian Navy (Reserve) and the wavy stripes, trade mark of RCNVR officers around the world, were to be seen no more.

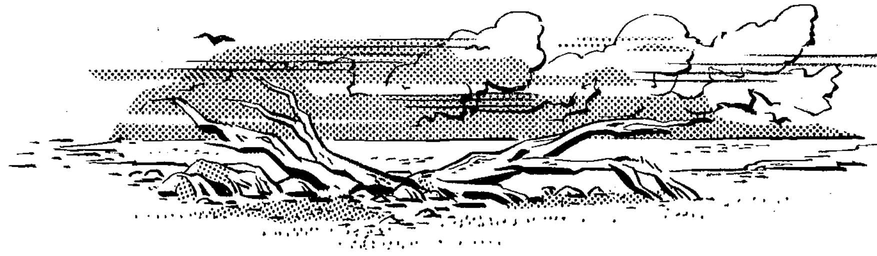
With peace in the world again, the RCN(R) settled back to its support function. Most of the war-time officers kept up their naval connections, even if they didn't serve with one of the RCN(R) divisions.

During the Korean War, many reservists transferred to the RCN and saw action against the communists aboard HMC ships.

In 1951 the wrens came back as part of the RCN(R) with the same rates of pay as men. In April 1953 a new command was established for the reserve, Commanding Officer Naval Divisions, with headquarters at Hamilton. A training centre was established at the new headquarters to provide training ashore during the summer months for the growing number of reservists. Ships up to anti-submarine frigate size sail into the Great Lakes every summer to take flocks of reservists aboard for seatime.

In January of this year the RCN(R) lost its brackets and became the RCNR. Today there are 21 Naval Divisions from coast to coast with an authorized complement of 900 officers and 3,700 men.

In his home a few miles west of Toronto, Gordon B. Jackson, now 73 years old, sits among his law books and naval souvenirs, and reflects on how far the reserve navy in Canada has come. Today the men and women of the RCNR have organization and training to back up their willingness to serve Canada when and where they are needed.



Newly designed all-fibreglass construction motor workboat; weight, 5,000 pounds; length overall, 27 feet; beam, eight feet; passenger load 30; stores capacity, two tons. (E-63724)

BOATS

The RCN looks to a modern industry to fill an ancient need

By
Captain A. B. Fraser-Harris,
Director of Naval Ship Requirements.

FOR CENTURIES, warships have carried small boats to fulfil a variety of roles ranging from life-saving at sea to the transfer between ships of personnel, stores and dispatches and the carriage of landing and boarding parties.

Because the boats were built of wood and had to be rugged to survive at sea and to withstand the rough treatment which they received when being hoisted or lowered, they were generally of heavy construction.

A traditional but real requirement for absolute reliability has supported the continued use of oars and sail in an era when both have long since outlived their practical application for many uses. In some instances, the gasoline engine has been employed but, particularly during and immediately after the Second World War, its use was viewed with disfavour, it being argued that the volatile fuel created fire and explosion hazards, not only in the boats, but in the parent ship where stocks of fuel might be ignited during action.

Traditional conservatism has also undoubtedly slowed down the rate of development of both boats and engines for the naval service. In the words of an ancient shipwright, "If God had intended fibreglass boats he would have grown fibreglass trees!" For these reasons, among others, the naval boat has tended to develop into a noisy and ponderous vehicle, overburdened by the weight of its own construction, generally under-powered and providing a relatively poor payload in proportion to its bulk and weight.

What can be done to correct this trend?

Not since the early days of the automobile has there been such a startling growth in public demand for a specific product such as there has been during the last decade in respect to the pleasure boat.

Industry has reacted by proportional increases in invested capital and skilled designers and craftsmen. Developments in the application of fibreglass, plastics, aluminum and plywoods to boat construction, and advances in both inboard and outboard engines and drive techniques, have all contributed to the production of attractive craft which are priced within reach of even modest incomes. And so, as highway conditions have become less and less conducive to relaxation and enjoyment, more and more people are indulging in nautical diversions to fill their leisure hours.

CONNECTED with this expansion in marine industries is a diversification of interests on the part of aviation companies. Recognizing the inevitability of production cutbacks in both engines and airframes as commercial aircraft become larger and faster, but fewer, and the military emphasis shifts to missiles, several large aviation concerns are actively producing boats.

This is a logical step, for not only are the problems of aero-dynamics and hydro-dynamics closely related, but many engineering techniques, developed in the aviation industry, have a clear application to marine construction. To mention but two examples, the development of the hydrofoil for high speed operation and the application of the gas turbine to ship and boat propulsion are obvious links between marine and aviation techniques.

The results, both of the increased public demand and of the industrial effort directed toward in its satisfaction, have been evidenced not only in rapid advances in hull design but in the provision of a wide range of power plants for marine use.

Thus there are available, on the commercial market, a great variety of hulls and power plants from which can be selected the best combinations to perform almost any specific tasks.

To the naval authorities, responsible for the provision of service boats, it therefore appeared logical to assume that, provided they could decide on the types of boats required to meet the service requirements, it should be possible to find on the commercial market, boats and engines that would meet the desired specifications.

There were obvious advantages apparent in such a scheme; boats obtained on the commercial market would, in all probability, be less expensive than the final product of a special service design and construction project; possibly advantage could be taken of more expert specialized small boat design skill than existed in the Naval Ship Construction branch, where talent was concentrated upon major warship design.

On the other hand, considerable caution would have to be exercised to avoid the bargain buy and the inferior product in the gaudy wrapper. Outside pressures would have to be firmly resisted. Only excellence of production and performance could be criteria for final choice. Carefully controlled tests would have to be run on possible contenders, and specifications would have to be tightly drawn.

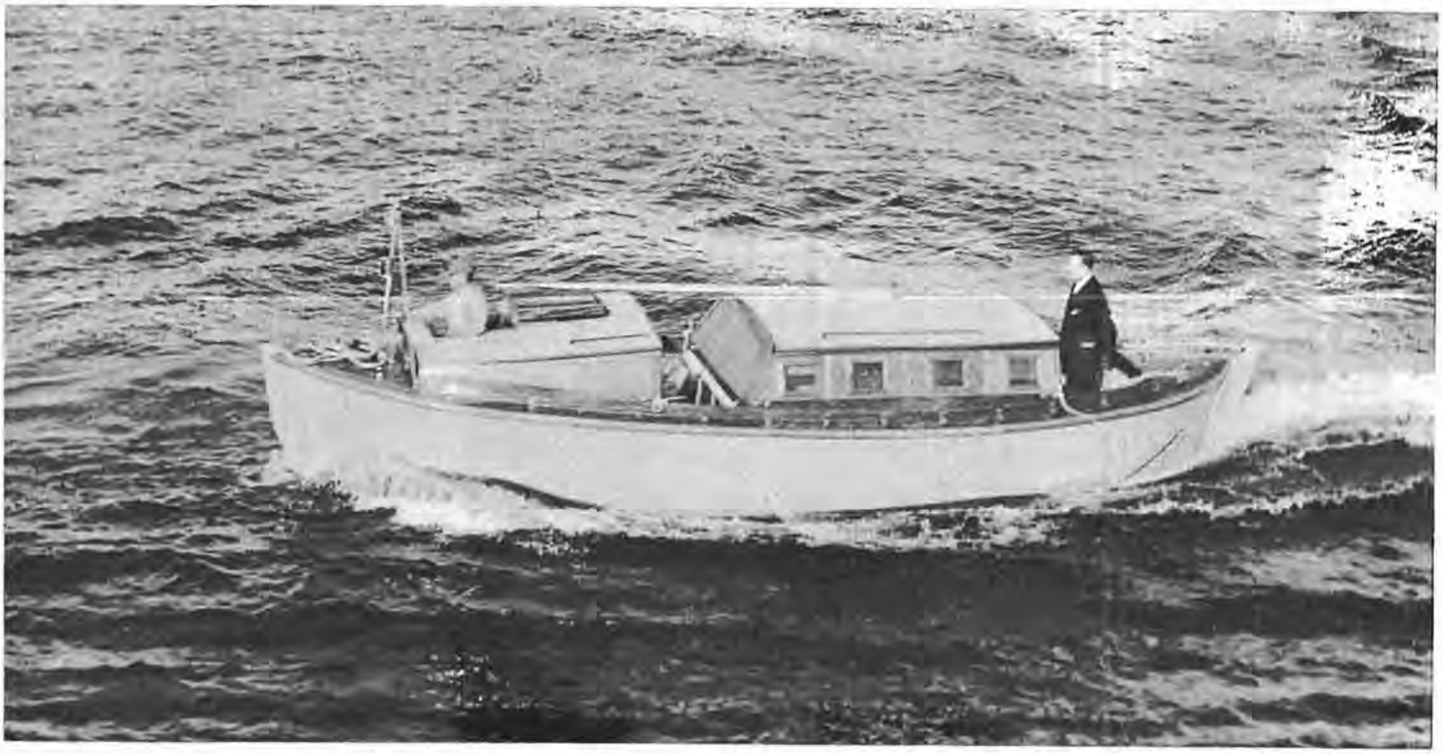
WITH THE DECISION made that at least an exploratory attempt would be made to obtain suitable boats from the commercial market, work commenced upon the task of determining what types of boat were required. Specifications must closely match operational requirements.

Naval vessels, both in peace and war, carry out a variety of missions and tasks and, in the performance of their duties, may operate either from their home ports or in far corners of the world. Frequently they are required to enter ports and harbours where there are no berths alongside, or to visit small island or coastal communities which lack even a harbour. They must not only be able to ferry their own ships' companies to and from the shore, but they must have the means to transport stores and equipment, provide landing parties, dispatch boarding parties, transfer inspecting officers, land troops or evacuate casualties and refugees.

These tasks demand the ability to provide efficient transport between ship and shore or between ship and ship. At a glance it will be seen that there are basically two types of mission which must be performed—those involving the transportation of heavy loads or large numbers of personnel, such as the landing of libertymen, transfer of boarding parties or embarkation of stores, and others which only call for light loading, such as mail runs, transport of commanding officers, collection of visiting dignitaries, carriage of officers of the guard, emergency medical runs and inter-ship visits.

Obviously two different types of boat will be required if these varied tasks are to be efficiently executed. For instance, a boat that is large enough to hold 30 or more men, or two tons of stores, will not be economically employed in the transportation of one or two persons. A smaller, reasonably comfortably equipped launch for the general use of senior officers, will be quickly reduced to unacceptable state if also used to carry a load of spuds and green vegetables. To oversimplify, a requirement exists for both the truck and taxicab. Neither can effectively fulfill the role of the other.

For the utility boat, the basic requirement is load carrying capacity, in terms of both weight and space. It must be large enough to carry about 30 men,



Traditional wooden construction, double-ended motor seaboat; weight, 6,000 pounds; length overall, 27 feet; beam, eight feet; passenger load, 25; stores capacity, one ton. The writer calls it "ponderous and inefficient". (O-6033)

Traveller "Polaris" 14-foot despatch boat under test off Halifax Harbour. (O-13815)

yet must be small enough to be davit hoisted. It must be highly manoeuvrable, for it will be required to operate in confined harbour and dock areas.

Speed is not paramount, yet becomes an important "factor of effectiveness", for only a limited number of boats can be carried in a ship, and a boat that is twice as fast as another will perform twice as many trips in a given period of time and thus prove considerably more effective. Speed is also important in the saving of working time. Ship-to-ship and ship-to-shore distances of four to five miles are not uncommon in an open roadstead, and an increase in available speed from 10 to 20 knots for a duty run of five miles involving 20 men will save five manhours.

Range must be considered, not necessarily in terms of a distance to be run, but rather as a figure of fuel availability, providing reasonable time between refuelling when employed in normal day to day operations.

Thought must be given here to the space and weight penalties that must be paid in the carriage of large quantities of fuel.

THE CALCULATION of weight versus range in respect to type of engine, amount of fuel required and boats' speed attainable, is very relevant in determining the optimum type of power installation. Since refuelling can be carried out from the parent ship, it may well be preferable to require less range but higher speed, thus increasing the availability of the boat and providing an additional carrying capacity.

In considering the case of the smaller despatch boat or runabout, the requirements are reasonably simple to express. Here, a passenger capacity of about four will be adequate and high speed is desirable, since many of the trips required will be of an urgent nature. A reasonable degree of passenger comfort and maximum reliability must be demanded.

Neither the utility boat nor the despatch boat will be required to operate in the open sea under really adverse weather conditions, but both must be capable of safe and effective operation, albeit at reduced speed, under such rough water conditions as are frequently encountered in an open anchorage or harbour approach.

With a fast workboat and a despatch boat effectively meeting the inshore operating requirements of an RCN destroyer type warship, there remain certain tasks for which a specialized type of seaboat will be required. Ships must have available a boat designed for such emergency tasks as the recovery of a man overboard, the rescue of a ditched aircraft's crew, or the transfer of an injured man from another ship at sea. Moreover, in the event of shipwreck, assuming that liferafts will be used to accommodate the ship's company, it will still be highly desirable to have a powered lifeboat or seaboat available to act as shepherd, keeping the rafts together and generally available to control and direct the survival operation.

IN IMPLEMENTING a program to provide these three types of boat for the RCN, two basic assumptions were made; the first, that practical and valuable experience which had been put in private and commercial use, was such that its use could be accepted for the great majority of service boats up to and including large workboats of about 30 feet overall; the second, that the outboard engines and inboard—outboard drives have similarly been developed to the point that they can be assumed to possess a sufficiently high degree of operational reliability for naval use.

The employment of plastic construction was an added advantage, for wooden boats demand skilled shipwrights for their maintenance and these men are becoming increasingly rare in an age of all-metal ships. To carry such artisans solely for boat maintenance is obviously uneconomic; moreover, the type of damage liable to be sustained by service boats is much more readily repaired "on board" in the case of the fibreglass boat.

The outboard engine also has many advantages for the naval user. Since, when not in use, service boats spend long periods at the davit-head with the ship at sea, they are subject to much exposure to wave and weather. The resultant constant salt spray and dampness are particularly hard on engines and electronics; if these can be removed and stowed in a workshop, they will obviously be more readily maintained in a serviceable condition. Again, with a standard inboard fitted boat, if the engine is unserviceable for any reason, the boat is automatically no longer available but, if an outboard engine should balk, it can, in moments, be replaced at the gangway with a serviceable engine and removed to an equipped workshop where it can be readily serviced, while the boat continues its duties.

The use of outboard engines does involve the acceptance of the use of gasoline, but the pressurized system employed, and the carriage of the engine outside the boat, greatly reduce the fire hazard from loose gas in the bilge. No great stocks of fuel need be carried in the parent ship since the portable tanks can normally be refuelled from shore-side sources.

In implementing these decisions, the Royal Canadian Navy has already made considerable strides. Three basic boat types have been agreed upon, namely, a utility or work boat, a smaller despatch boat and a seaboat. Detailed characteristics have been agreed upon and plans for the development of the boats were based on the following considerations.

AT PRESENT in service with the Fleet is a double-ended 27' wooden motor boat, powered by a 35 hp diesel. The boat is typical of the descendants of the traditional naval boat, heavy, slow, and offering limited space for load carrying. It requires a coxswain to drive it, and an engineer to operate the diesel. Although seaworthy at slow speed, its double-ended feature causes "squatting" at full power and, under load, the boat is ponderous and inefficient.

Since the major drawback of this boat resulted from lack of space at the davit head for a design with adequate beam-to-length ratio, and the replacement of davits in existing ships was too costly, it was decided that the ultimate production of a really efficient workboat for new construction ships would be undertaken in two stages—an interim boat would be produced as soon as possible to fill immediate needs, and a long term experimental program would be commenced.

To provide an early replacement, the naval architects went to work on a radical modification of the existing design. The lines were filled out and a square counter incorporated, thus both increasing available loading space and improving performance characteristics. A prototype of this boat, constructed entirely of fibreglass and incorporating many modern concepts of control arrangements and built-in-fittings has been built in the West Coast Naval Dockyard plastic shop and is at present under operational trial.

Sixteen-foot Boston Whaler undergoing test. The 13-foot model of this boat will be used as a small tender for ships. (O-13835)

The boat has so far proved considerably superior to its predecessor, though it still remains a relatively slow, displacement-type boat. As soon as trials are completed, a number of these boats will be ordered from industry, the mold being supplied by the Navy.

This boat is regarded as an interim model only, and to test the use of fibreglass for the service workboat.

The long range test program is now being embarked upon to provide the Fleet with a faster and more versatile utility boat for use in new construction ships.

For this project, considerable interest is being taken in the longitudinally straked hydrolift hull design from the drawing board of C. Raymond Hunt. These boats have already proved their extraordinary ability by twice winning the Miami-Nassau power boat marathon and cleaning up in a number of other important seagoing power boat races on both sides of the Atlantic.

From the naval standpoint, the great advantages of this design are its excellent seaworthiness throughout the speed range, and its ability to provide relatively high speed under all conditions of loading. This latter is very important, for whereas the more traditional hard-chine planing hulls provide high speeds, and in many cases, a good seaworthy ride when on the plane, they tend to be sluggish, wet, and poor seaboats when so loaded that they cannot be got "up". In rough sea conditions they are also subject to heavy pounding and are predisposed to broach and plough.

TESTS ALREADY carried out by the Navy on boats of this design confirm its ability to provide a progressive amount of lift throughout the power range, to perform very satisfactorily in the slow displacement mode in rough water, and to operate at high speed under similar sea conditions in a truly satisfactory manner.

The high beam-length ratio of this design presents a problem in relation to existing davits. For example, a 25' comparison to the eight-foot beam of the naval 27-foot displacement design.

This davit restriction will, however, be overcome in new construction ships and does not, therefore, present a long term obstacle to their shipborne use.

A hull of the Hunt type of about 25' overall length will, it is anticipated, provide a superior load carrying capacity both weight and space-wise, to that of the 27' naval design and, with adequate horsepower, should provide rough water operating speeds in the order of 20 knots when loaded. It is of note that the power considered here is in excess of 150 hp as opposed to the 35 hp in the existing workboat. While, in the commercial field, this would be accepted as a normal figure, it is regarded in some naval quarters as quite radical for a workboat.

What type of power plant will be used? It is here that there is room for much careful study and test.

Comparative performance figures for gasoline, diesel and turbine engines, including weight-to-range factors for total installations and fuel stowage, are hard to come by.

There are many opinions but few scientific test data.

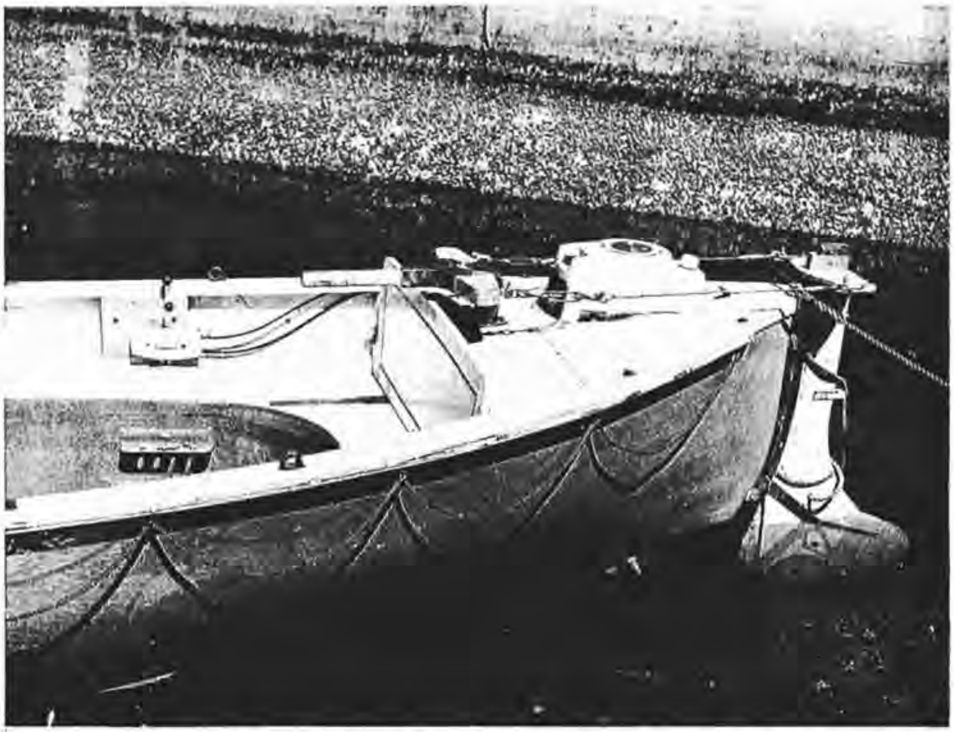
The relative merits of outboard engines, out-drives, V-drives and standard inboard installations must all be carefully considered and related to the basic requirements. Serviceability and reliability must be carefully confirmed by field test.

One outstanding advantage of the outdrive propulsion system, whether it be by outboard motor or by inboard-outboard installation, is the high degree of manoeuvrability obtained at slow speeds.

Again, since service boats are from time to time required for beach operation or to manoeuvre in water fouled by debris or wreckage, the "kick-up" feature of the outdrive is desirable.

Present intention is to obtain two experimental hulls of the Hunt design and use them to carry out comparative trials or engine installations, both twin and single, both gas and diesel, and, if a suitable engine can be obtained, a turbine.

These trial results will lay the foundation for a new generation of fast, highly manoeuvrable and seaworthy general-purpose work boats for the Royal Canadian Navy.



Eighteen horsepower outboard engine installed in a well in a 27-foot plastic whaler. The boat will exceed seven knots this power and motor installation does not affect sailing or pulling. (E-62083)

THE task of providing a suitable small, high speed despatch boat is much simpler; for in this class of boat there are many models available on the commercial market from which a choice can be made. It was decided initially that a runabout of approximately 14 feet overall length was required. It could not exceed 14'2", since this was the spacing between existing davits in the majority of RCN ships, and the only stowage space available on board ship was between the davits, under one of the other boats.

The ability to carry a coxswain and four passengers was stated and the boat had to perform safely, at reduced speed, in waves up to four feet and in high wind speeds.

A twin 18 hp outboard engine installation was selected. An outboard drive was preferable for reasons stated earlier and a twin installation provided important additional safety for off-shore operation. Not only was 35-40 total horsepower approximately that desired to provide the correct performance, but an 18 hp engine was almost spot-on for installation in the 27' seaboat, which will be discussed later in this article, to produce effective displacement hull speed for that boat. By using the same engines for both boats, additional interchangeability and, thus, serviceability could be obtained.

The 18 hp engine, with weight less than 100 pounds, was also the largest which could be considered truly portable. To change a larger engine at a gangway with any sea running was not considered practical.

An invitation went out to industry to provide suitable boats for test and, in the summer of 1961, a number were subjected to comparative test under conditions that might be encountered in service operation. In addition, stringent rough water tests and manoeuvring trials were carried out.

One point became immediately apparent and it was, from the point of view of the industry, an interesting one. Despite the superficial similarity of all but two of the boats tested, which were of unusual design, they displayed radically differing performances under operational and rough water conditions.

That such should be the case is not surprising when it is borne in mind that these boats are designed and manufactured by companies with a wide spread of design experience and engineering competence.

For this reason considerations, not only of operational efficiency but also of safety of life at sea, demand the most stringent tests to determine the absolute suitability of any boat accepted for service use; moreover, there is an additional advantage to be gained from service trials of this nature. In many instances manufacturers have neither the experienced personnel nor the facilities to conduct such trials. They may therefore, in all good faith, be providing to the general public a boat that cannot be considered in all respects operationally safe. How unaware of the value of such test data many of the manufacturers are, is amply demonstrated by the fact that only two of the firms concerned have since consulted the naval authorities conducting the trials to determine how their boats made out.

AS A RESULT of these preliminary trials, three boats have been selected, two for further trial with the Fleet at sea under operating conditions, and one, the 13' Boston Whaler, a radical but outstanding design, as a tender for minesweepers and other smaller vessels of the fleet.

The two boats selected for further trials with the fleet are: the Traveller "Polaris", a boat designed by the Arkansas Traveller Company of the United States and built in Canada by the Traveller Boat Company, of Peterborough, and the Raymond Hunt designed 14′ prototype hydrolift hull, which is to be built in Canada by the Canada Yacht and Boat Company of Toronto. Both boats turned in excellent performances, though their behaviour pattern, particularly in rough water, was quite dissimilar.

During the trials, all boats were powered by a twin Johnson 18 hp installation, general serviceability was excellent, and the desirability of the twin installation was twice demonstrated when engine failure occurred at sea but the boat was able to return safely on one engine.

It is confidently anticipated that the full fleet trials will confirm the feasibility of obtaining on the commercial market both hulls and engines suitable for the despatch boat role.

It is also probable that the cost of the program will be less than it would have been if the navy had embarked upon the design and contract production of its own model. Such is the value of a competitive market.

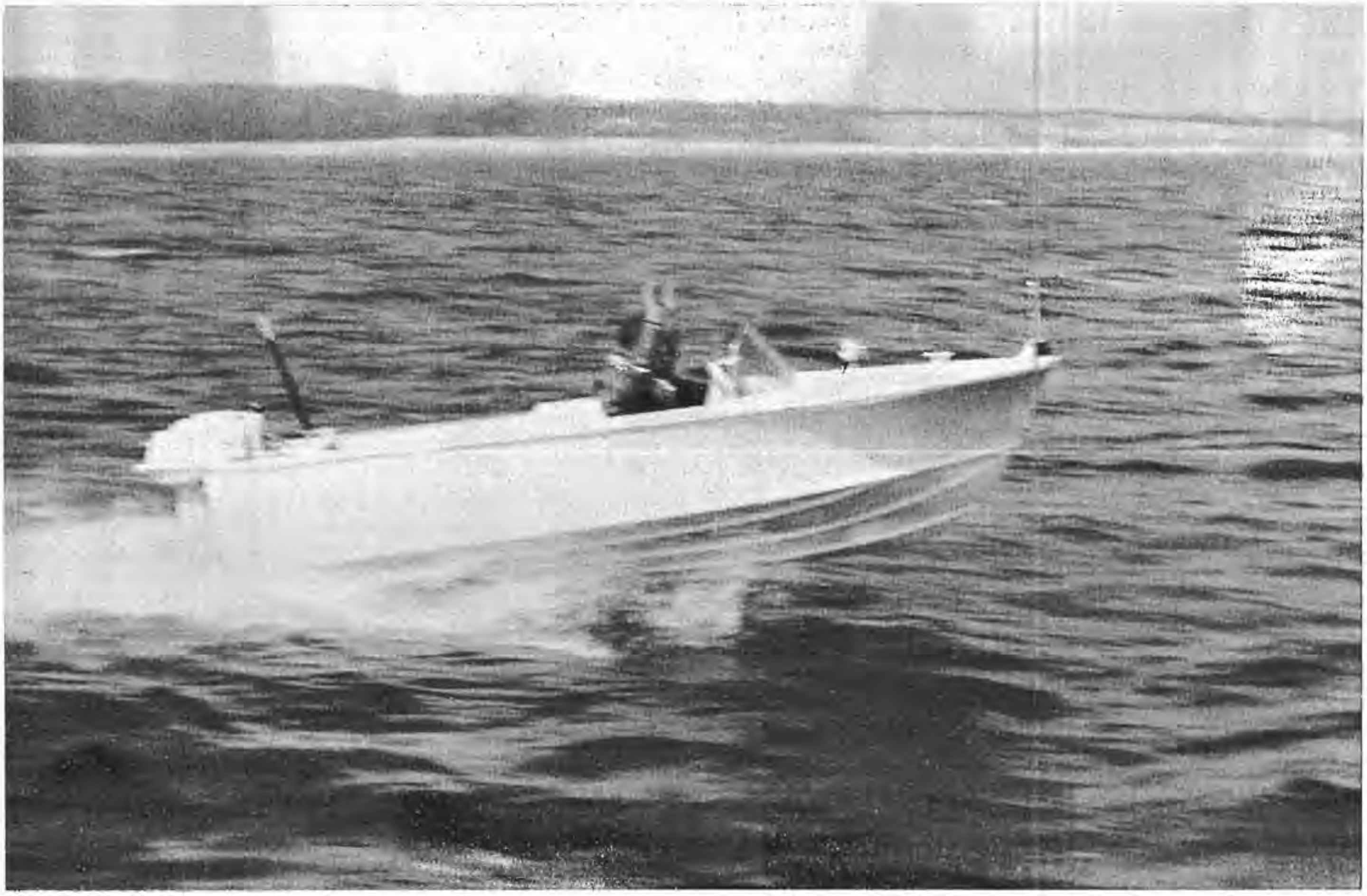
THE LAST BOAT to be discussed is the seaboat. Here there is less room for manoeuvre, for these boats must inherit the traditional strength, seaworthiness and design concept based upon centuries of hard experience. As has been mentioned earlier, the first step has been the provision of power to the existing 27′ whaleboat, already of fibreglass construction. This has been done by installing an 18 hp outboard engine in a well situated abaft the stern sheets.

As at present installed, this engine does not have freedom of movement, the boat still being steered by its existing rudder, controlled by a yoke. This compromise, despite the sacrifice of manoeuvrability at slow speed, has been accepted for two reasons: first, major structural alterations to an existing boat are avoided, and secondly, in the event of engine failure during emergency, the boat can still be controlled under oars without the hazardous requirement of shipping a rudder in a seaway.

Although this boat has undergone successful trials with the fleet, and a modification program has been authorized to incorporate the well in all existing boats of this class, it is recognized that further development will be required to produce a really efficient powered seaboat in which propulsion by oars can be abandoned once and for all time.

In the year and a half since the Royal Canadian Navy inaugurated its new small-boat policy, much has been done to advance the state of the art and considerable interest has been generated in the related industries, both in Canada and in the United States.

It is the hope of those concerned that, just as service support has proved of considerable assistance to industry in the rapid development of aircraft, so the Navy, as a responsible maritime authority, will, in applying the knowledge of its seamen and technicians to the scientific development of boats for its own use, provide similar impetus to the development of sound and efficient craft for the commercial market.



"Look, Ma! No hands!" The Hunt 14-foot hydrolift hull is shown under test for the maintenance of longitudinal stability. (O-13816)

Career Counselling

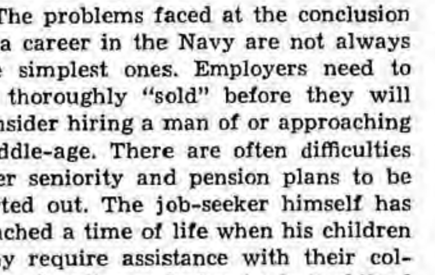
THE AVERAGE Canadian serviceman is a two-career man. Typically, he retires from military service in good health, with a rich background of training and experience, a modest pension and the necessity of establishing another career that will take care of him and his family until his ultimate retirement 20 or more years hence.

The Royal Canadian Navy recognizes that it is not the easiest thing in the world for a man to step from the deck of a warship onto "civvy street" and has, therefore, established a system of career counselling, which not only helps a sailor to evaluate the type of work ashore for which he is best suited but assists him in finding a job.

The transitional counselling service is there to be used by the officer or man approaching retirement but it is not compulsory. Many personnel leave the service with a pretty clear cut idea of what they are going to do, either in business of their own, for which their naval service may have trained them, or in the employ of someone else.

The problems faced at the conclusion of a career in the Navy are not always the simplest ones. Employers need to be thoroughly "sold" before they will consider hiring a man of or approaching middle-age. There are often difficulties over seniority and pension plans to be sorted out. The job-seeker himself has reached a time of life when his children may require assistance with their college education and when he feels obliged to establish a permanent home. He cannot take a chance on accepting the first job that comes along. It must be one that pays enough for him to meet his responsibilities.

Fortunately, naval training and experience provide a pretty good background for civilian employment. Right from his earliest days in uniform, the sailor learns how to get along with his fellows and how to take charge of a task and see it through. In the years that follow, he learns a number of skills that will be of value to him in civilian life. He is likely, indeed, to have undergone advanced technical training.



The commanding officer of a destroyer escort, in effect, runs a business employing some 250 persons. The efficiency of his ship is dependent on his skill and experience as a manager, his success in delegating responsibility to department heads and his ability to obtain measurable results in a variety of tasks. There is a close parallel in this to the job of a manager in an industrial organization, whose aim is to conduct an efficient, economical and profitable operation.

Similar parallels may be drawn at any level between the navy and industry. All retiring naval personnel

have worked throughout their service careers within this type of framework either at sea or ashore. Most of the officers who are retiring have reached the rank of lieutenant-commander and most the men have attained the rank of chief petty officer and have been employed in the navy in middle management or supervisory capacities. This is a type of experience that can be applied almost anywhere. In addition, they have extensive technical knowledge and ability to adapt to changing conditions to offer to civilian enterprises.

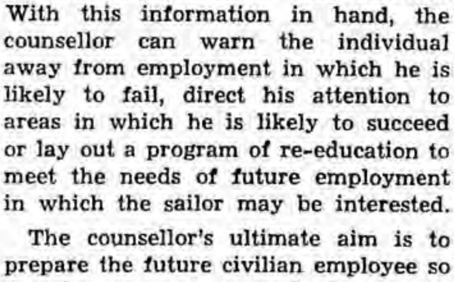
The chief petty officer in charge of a watch in a destroyer's engine room has a great responsibility in supervising the efficient operation of a complex steam propulsion and electrical generating plant—a plant that produces enough power to take care of the needs of a fair-sized town. While on the bridge, the officer of the watch has to be prepared to make instant decisions affecting the safety and successful operation of a multi-million-dollar ship and scores or hundreds of lives.

Unlike the civilian, the sailor has a fairly certain knowledge, months and even years in advance, of when his job will terminate. However, he may not be sure what kind of job the outside world has to offer him or how his skills compare with those of the persons employed regularly in that type of work.

What should he do? As much as five years in advance of his retirement date, he should approach the Navy's transitional counsellor, who will undertake to assist the officer or man in translating his naval knowledge and experience into saleable personal assets and relate them to civilian employment. He is wise to seek the advice of the counsellor at an early date even if he has made up his mind on his future type of work. Sometimes naval personnel, after having spent a third of a lifetime off "civvy street", have a somewhat naive outlook concerning civilian employment. The counsellor, by interviews and conventional psychological testing, can build up a dossier on the person's likes, dislikes and abilities. With this information in hand, the counsellor can warn the individual away from employment in which he is likely to fail, direct his attention to areas in which he is likely to succeed or lay out a program of re-education to meet the needs of future employment in which the sailor may be interested.

The counsellor's ultimate aim is to prepare the future civilian employee so that he can seek work in his chosen field with confidence and knowledge. Most officers and men are well acquainted with the role of the transitional counsellor and appreciate the value of the service.

The potential employer wants to know what an applicant has achieved in the past in the field he is seeking to enter. The servicemen's saleable assets are his service training, his acquired skills and his ability in group management.



What the counsellor does is to assist in the preparation of a résumé or digest of the serviceman's experience and training to give honest and favourable information to a prospective employer.

The counsellor may approach the program in this way:

An exploratory interview determines how far the officer or man has gone in thought or action toward taking care of his post-retirement needs. This may involve directing an orderly series of fact-finding questions at the person or it may take the form of a general conversation on the subject of retirement which will bring out indications of abilities or aspirations which have a direct bearing on the type of work the applicant should seek. The purpose of the exploratory interview is, in effect, to make the man see himself in true perspective.

The results of this interview are reinforced by the findings of intelligence, aptitude and preference tests, which are disclosed to the individual and discussed.

Once this general assessment of ability and background has been made, consideration is given to the civilian needs and personal obligations of the applicant.

It should be borne in mind that transitional counselling is not a placement service, although close liaison is maintained with the National Employment Service. In this regard, the individual is expected to make his own decisions regarding a reasonable course of action.

However, the transitional counsellor assists the job applicant by advising on the best methods of writing letters of application and of preparing a digest or résumé, outlining his training and experience.

The written presentation must be an objective assessment of the person's ability and personality, and must not be coloured by the counsellor's opinions or feelings.

Equipped with a surer knowledge of the role he is capable of playing in civilian life than he may have had before and with a clear statement of facts to lay before a prospective employer, the newly retired officer or man approaches prospective employers on his own. If he is not immediately successful in finding employment, he is encouraged to return, wherever possible, to the transitional counsellor and discuss possible errors in his presentation.

To sum up, the Navy considers that the economy of the country and its own personnel will both benefit if the training and experience of the ex-serviceman are properly presented and utilized. To achieve this, the Navy has made available trained counsellors to assist with rehabilitation and has enlisted the sympathetic assistance of other government agencies. The program has been carefully designed so that there is no duplication of or infringement on the functions of other agencies, either governmental or civilian.

To assist the Navy in achieving its goal, the Director of the National Employment Service and the Chief of the Settlement Services of the Department of Immigration have given and are continuing to give invaluable guidance and support.

A group of Argentine naval officers recently spent a few days on board the aircraft carrier Bonaventure to observe air operations. Shown with Captain F. C. Frewer, commanding officer, (right front), and Cdr. R. H. Falls, Commander Air, (left front), are, from left, Argentinians, Lt. Juan Inon, Lt.-Cdr. Carlos Suarez, Lt.-Cdr. Jorme M. Grau, Lt. S. Martinez Autin, Lt.-Cdr. Alfredo del Freson, Lt.-Cdr. Estanisloa de la Torre and Lt. Barry Hussey. (BN-4627)

Club 44

— *Sailors' Haven* —

By

PO Jim Brahan

A NEW, ultra-modern establishment, far beyond the dreams of past leading seamen, has grown from the former Fleet Club at HMCS *Naden*, Esquimalt.

"Club 44", named after the building in which it is housed, was formerly known as the Fleet Club. Its patrons are seamen of junior ranks serving in the RCN's Pacific Command and their guests.

In 1956, on hearing it was intended to form a club to be used and administered by men up to and including the ranks of leading seamen, a few old-time naval sages made clucking noises with their tongues and flatly said: "It will never work."

However, after the usual teething troubles at the beginning of a venture of this magnitude, the Fleet Club caught on and the attendance has steadily increased.

Now the pundits are being made to swallow their sour prophecies and the navy men's club has grown to be one of the best on Vancouver Island.

Until January of this year only the second floor of the building was used and the club was open only on weekends. This proved to be inadequate, as each night the place was filled to capacity and many members and their guests had to be turned away at the door.

With the official opening of Club 44 on January 7, 1962, the entire building was taken over and it operates every night of the week.

The main floor is used as the lounge and there is strict rule that it is for couples only. The second deck is the games room. Here a man in his leisure hours can play at snooker or ping pong, exercise his skill on the shuffle boards or relax before his favourite television program. In the basement it is intended to set up a snack bar and a banquet room. Some of these features are still in their beginnings because the whole organization is a pay-as-you-go proposition.

The efforts and cash contributions of junior seamen in the Pacific has made of "Club 44" a pleasant and relaxing social centre for off-duty hours. (Photo courtesy Ryan Brothers, Victoria)

Whenever possible, top-flight entertainers are hired for the week-end dances. The club has featured such talent as the famous pianist Lionel Hampton, the vocal groups Four Nites and the Hi-Liters. One of the club favourites is the Australian singer Rolf Harris, who has made two appearances.

Always keeping a weather eye on expenses, management arranges, if at all possible, to billet visiting guest stars in the homes of members. Apparently the entertainers also approve of this arrangement, finding a private home a restful change from a hotel room and a haven from autograph seekers.

For the past three years Cliff Finlayson's "Club Quartette" has been the official orchestra. According to Bandleader Finlayson, they enjoy playing for the dances because, he claims: "It is a good atmosphere and, being a young crowd, they like all types of music."

The main lounge is the most spectacular part of the building. It has been sectionalized into three distinct units

"Name" performers appear frequently at "Club 44". Here Patricia Frawley, of Halifax, sings to the accompaniment of the Club's regular orchestra, Cliff Finlayson and His Club Quartette. (Ryan Bros. photo)

—the Polynesian Room, the Mahogany Room and the Cedar Room. If desired, each part may be closed off for private functions without disturbing the other sections.

The Cedar Room is paneled in aromatic Tennessee cedar and a faint scent of the natural wood is always present. The centre section has been lined with deep-grained mahogany, giving an atmosphere of richness and age.

By far the most popular is the Polynesian Room. Its Oriental woods, murals of native scenes and simply designed draperies reflect the informality of the South Sea Islands.

The whole lounge, with its indirect lighting and hushed music, tends to create a sense of serenity and friendliness where the members and their guests can relax and enjoy themselves.

To completely renovate and redecorate the building was a large financial operation and existing funds were insufficient to meet the costs. Donations came from the men in the ships and establishments of the Pacific Command.

Materials were paid for as they were used and most of the labour was done by the sailors in their off hours. The members' wives helped out on occasion by working in the checkrooms and helping with the decorations.

Although the club has been hard pressed for funds at times, it has still managed to allocate more than $3,000 to charitable purposes.

Even the parking problem has been taken into consideration. On nights when a large crowd is expected fully uniformed sailors, wearing white belts and gaiters, are on hand to control the traffic and make the parking of cars a simple matter.

It was considered quite an accomplishment when the club survived to celebrate its anniversary in June 1957 but it has been growing ever since. (E-41292)

HERE AND THERE IN THE RCN

Nature's wayside inn—the coconut palm—provides food and drink for the tropical traveller. All he has to do is go and get it. This seemed like a good idea to AB Sam Burlo when his ship, HMCS Margaree, stopped for a day at Subic Bay in the Philippines to refuel during the training cruise by three destroyer escorts of the Second Canadian Escort Squadron to southeast Asia. The coconuts were reported to be much too green to be appetizing but at least AB Burlo has something to talk about the next time he visits his home town of Edmonton. (CCC2-691; CCC2-679)

HMCS Grilse, Pacific Command anti-submarine warfare training submarine, proceeding into harbour at Esquimalt. (E-62065)

An international gathering over a cola at the NAAFI canteen in Gibraltar during NATO exercise Dawn Breeze Seven. Left to right: Kpl. J. C. Baier, of Holland, serving in HMNethS Overyssel; Philippe Guilbert, of France, serving in the destroyer Casabianca; Ldg. Sea. Alan J. Thomas, of Hamilton, Ontario, serving in HMCS St. Croix; Junior Technician Philip H. Burton, RAF, of Oxford, England, and AB Fred Gilrick, of Sunderland, County Durham England, serving in HMS Broadsword. (HS-67600-67A)

A rare sight to Canadian eyes, this is one of elephants bathing in Ceylon. The sailors are from the ships of the Second Escort Squadron of the Pacific Command which took part in Commonwealth exercises in Far Eastern seas this year. (CCC2-768)

Cdr. Peter Cossette, commanding officer of HMCS Hochelaga, (centre) is shown here with the personnel who won the Food Services Executives Association Culinary Arts Trophy. The trophy is on the table. Left to right are: Ldg. Sea. W. S. Cairns, PO J. W. McGill, CPO J. M. Vanasse, CPO W. H. Barclay, Cdr. Cossette, CPO A. W. Shano, PO L. W. Pelletier, PO J. R. Skinner, and Ldg. Sea. H. D. Hanley. (ML-10676)

Glory for the Cooks

LONG-DESERVED glory finally came in rich abundance to the cooks and stewards of the RCN when they triumphantly carried off the Food Services Executives' Association Culinary Arts Trophy, after decisively demonstrating how good naval cooking really is.

The competition, called in full "The Food Services Executives Association Canadian Armed Forces Food Services Award Program", was part of the 26th Grand Salon Culinaire of the Province of Quebec, held in the Sho-Mart building in Montreal from January 30 to February 2.

The FSEA has undertaken to sponsor the military competition as an annual event (1962 was the first year) with a view to bolstering the prestige of armed forces cooks, and to creating a greater awareness among the public of the importance of food services and the necessity for high standards in this field.

Although the competition is open to nation-wide entries from all three armed forces, only one ship and one army unit presented entries. The RCAF did not enter. HMCS *Hochelaga,* where Navy cooks learn their trade, had 29 major entries as opposed to two entries by the Royal Canadian Army Service Corps.

The judges, 10 experts headed by Claude Terrail of Paris (owner of the famed La Tour d'Argent restaurant), are said to have declared the competition won by the Navy almost the moment they walked into the room.

One of the most spectacular naval pieces was an actual size replica of the King Edward crown, made by CPO A. W. Shano. No supports or reinforcements of any kind were used in making the crown. The golden arches and Maltese cross were made of solid icing; the base of fruit cake and icing. The crown, which weighs 40 pounds, is now on display in the showcase at *Hochelaga,* where it may stay indefinitely, so enduring is its heavy icing.

Two elaborate lobster displays, designed and made by PO J. R. Skinner,

Last year, when the destroyer escort Haida *was undergoing refit at Marine Industries Limited, Sorel, Quebec, members of the stand-by crew witnessed to starboard the death of the Algerine escort vessel* Portage *and, to port, the growth of the new destroyer escort* Nipigon. *It could not be said the* Portage *would never sail again for the new ship incorporates steel made from scrap from the old. Assaulted by cutting torches and fire, the* Portage *vanished from sight in 20 days. Her superstructure was first removed and then she was set on fire to remove wooden fittings, corticene deck coverings and anything else that would burn. Then the welders slashed at her, plate by plate and deck by deck until she was no more. The slips at Sorel can handle six ships, which are hauled up a marine railway to dockside level and shifted sideways on rollers in a slow, but nonetheless spectacular, evolution.* (0-13911; 0-13914; 0-13918)

received much attention. One depicted lobsters fighting and the other, quite astonishing in its detail and lifelike appearance, a small orchestra complete with instruments. The lobsters were the players.

The layman can look in awe at a beautiful piece of culinary art but he is only dimly aware that behind the impressiveness of the finished product lie many hours of painstaking labour. Eight people worked for two weeks to produce the Navy's effort. It took virtually all their spare time. They worked as late as two o'clock in the morning, sometimes having to undo several hours' work and start again, when they decided a certain piece of work wasn't up to their high standard.

Another popular exhibit was a flat cake supporting a realistic winter scene in coloured icing, which was made by PO L. W. Pelletier. The scene was in semi-relief, rather like a heavy oil painting. Viewing work such as this, one realises why it is called "culinary art", for there is no mistake about it, this isn't just cooking—it's art: as creative and requisite of talent as art can be.

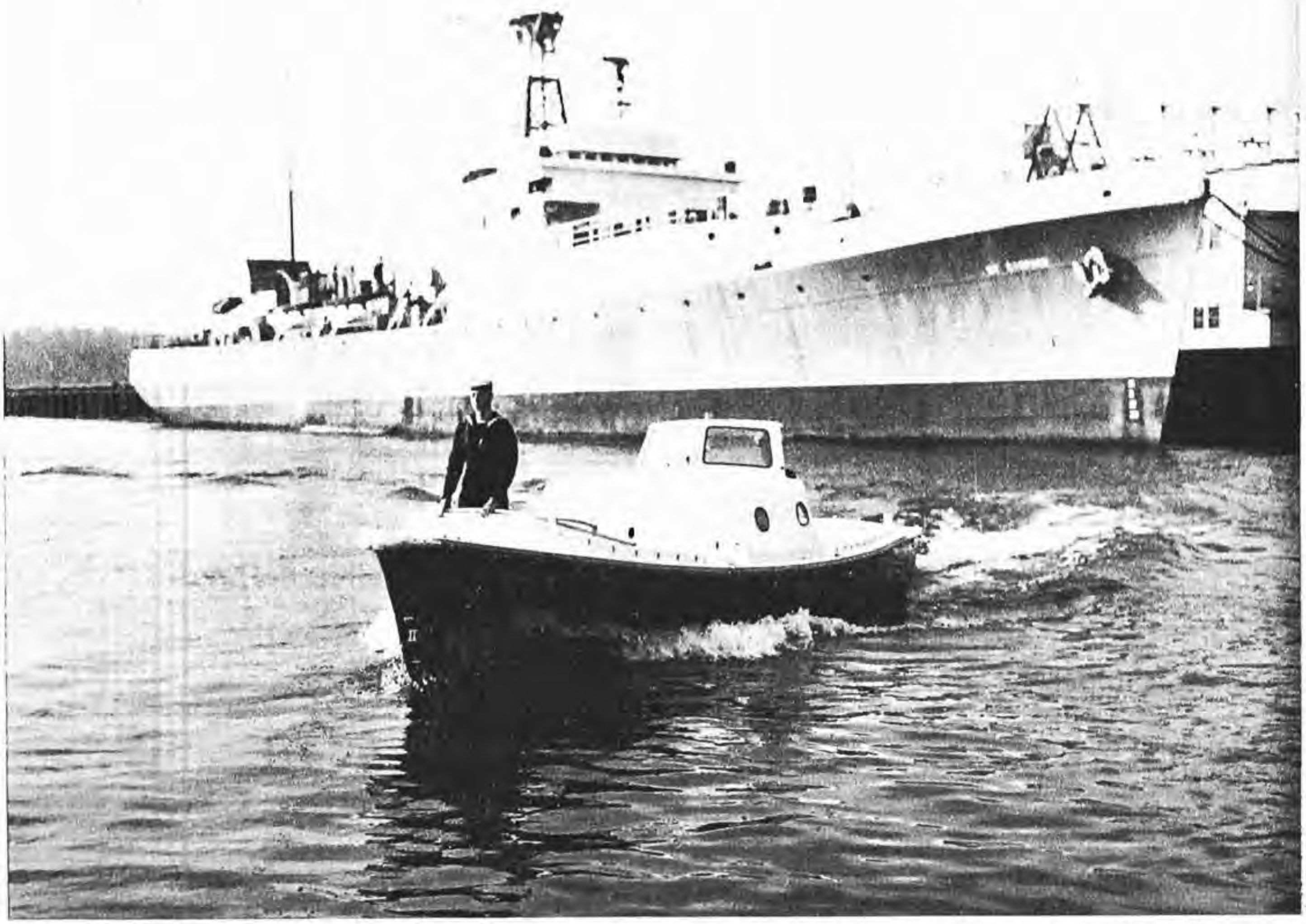
A glazed, stuffed, whole suckling pig, complete with apple in its mouth, provided a mouth-watering spectacle. This was prepared by CPO J. M. Vanasse who, working with PO J. W. McGill, Ldg. Sea. W. Cairns and Ldg. Sea. H. Hanley, turned out an impressive array of fancy food—glazed hams, vegetables, glazed and decorated fish, roast beef, and many digerent sorts of fancy bread.

The dessert section (apart from cakes) was the result of the efforts of CPO W. Barclay. This section of the display consisted of maple leaves, cookies, and fruit made of marzipan, plus a 265-ounce sherbet. Just how he kept the sherbet cold during the display is his secret! Chief Barclay's display of marzipan fruit in a woven basket of bread later went on to further display in the gourmet department of the T. Eaton Company's main store in Montreal.

The display contained all the courses for a full meal—and what a meal it would have been! Unfortunately, it was never eaten, but the sacrifice was worth showing the Army and the public that, contrary to popular belief, the Navy lives very well by its cooks and stewards.

While the Navy walked off with the trophy in well-deserved spendour, the Food Services Executives' Association, headed by president Walter Raftery, went quietly back to work to prepare next year's and other shows. Without the FSEA none of the applause for the Navy would have been earned, for the display could not have been held. The association did all the organizing, provided the trophy, and what is more, donated the large space in the Sho-Mart building where the competition took place and for which the Navy is extremely grateful.

The Army has promised that next year the trophy will be tougher to win. However, the cooks and stewards of HMCS *Hochelaga* are already beginning to think of new creations and better techniques, and are confident that they can top any effort the other two services may make. One of our cooks, when asked by an awed observer what he could possibly do next year after the superlative quality of this year's show, expressed the attitude of champions in his single-word answer: "Better."—P.J.K.



In the background in this picture of one of the RCN's fibreglass motor boats is the Canadian Coast Guard Ship St. Stephen, North Pacific weather ship whose White Ensign was lowered in 1950. As an RCN frigate she served in the Second World War and later as a weather ship in the North Atlantic. (E-63702)

Luxury and Ignomy

The Frigate Story

STILL PERFORMING yeoman service for the Royal Canadian Navy are 18 frigates, all veterans of the Second World War.

The Navy gave the ships a vigorous overhaul in the '50s and returned them to service. Eleven of the vessels operate from Halifax in two squadrons while a third squadron of seven ships is employed on the Pacific Coast. Three frigates were loaned to Norway in 1956, then given outright in 1958 under the terms of Mutual Aid to NATO countries.

Today's frigates have a different look from the 70 which Canada commissioned in the Second World War. The present ships have flush decks, enclosed bridges and more modern equipment for detecting and destroying submarines. Today's frigatemen sleep in bunks and eat in cafeterias, a far cry from the hammocks slung over mess tables in crowded wartime messdecks.

The RCN's St. Laurent and Restigouche class destroyer escorts were dubbed "Cadillacs" by their first enthusiastic occupants. With perverse pride, frigatemen call their ships "Tin Lizzies". A frigate's rugged design, long staying powers and simple maintenance problems make it a safe bet that this class of ship will be useful for quite a few years to come.

In the Second World War, RCN frigates took part in the sinking of 11 enemy submarines while on convoy escort or anti-submarine patrols.

Of the frigates still in service, HMCS *Swansea* helped destroy three submarines in 1944 and the *La Hulloise* assisted with the destruction of another in 1945. Both are now units of the Ninth Escort Squadron based at Halifax. The *New Glasgow*, of the Fourth Escort Squadron based at Esquimalt, was also credited with a U-boat kill in the Atlantic in 1945.

Many of the wartime frigates were readied for service in the Pacific but hostilities ended before they could be sent to that theatre. The majority of them were sold outright to become, in jocular jargon, razor blades. The most dazzling postwar face-lifting was done to ex-HMCS *Stormont*, now the luxury yacht *Christina*, owned by multi-millionaire ship owner Aristotle Onassis.

This is a ship on board which Sir Winston Churchill has been a frequent guest on Mediterranean cruises. One of the ex-frigate's luxurious features is a swimming pool with a marble mosaic bottom. Once the pool is drained, the floor can be elevated to deck level to serve as a dance floor.

Also given the status of floating palace was the former HMCS *Carlplace*, which was purchased by the Dominican Republic and became the presidential yacht *Presidente Trujillo*, with extra accommodation and deck houses built fore and aft.

Nine navies of the world have frigates commissioned by the RCN during the Second World War, although not all these ships were Canadian-built.

One or possibly two former Canadian frigates serve with the Royal Ceylon Navy (RCyN). HMCyS *Gajabahu* is the former HMCS *Hallowell*, but there is some doubt as to the origin of another frigate listed in *Jane's Fighting Ships* as ex-HMCS *Violetta*.

Four British-built frigates, which were commissioned by the RCN, are still in service, ex-HMCS *Annan* with the Royal Danish Navy and ex-HMC Ships *Loch Achanalt* and *Lock Morlich* with the Royal New Zealand Navy. The Royal Navy has the former HMCS *Loch Alvie*.

Chile has two former Canadian frigates, ex-*Glace Bay* and ex-*Joliette*, both purchased in 1946, and Peru also has two, the former *Poundmaker* and *St. Pierre*. Another, ex-HMCS *Strathadam*, serves in the Israeli Navy. The three Prestonian class frigates with the Royal Norwegian Navy, are the former *Prestonian*, *Penetang* and *Toronto*, which now bear the names respectively, of *Troll*, *Draug* and *Garm*.

A Canadian-built frigate, constructed in Montreal for the U.S. Navy and which has since borne the names USS *Asheville*, HMS *Adur* and HMS *Nadur*, is serving in the Argentine Navy under the name *Hercules*.

This list does not include the many former Canadian corvettes serving in other navies, some of which have been re-classed as frigates. Perhaps Canada should have been consulted before such a re-classification was made, because it was this country that made "frigate" modern naval usage by applying it to a class of ship referred to in the designing stage as "super-corvette" or "twin-screw corvette".

Three former RCN frigates, the *St. Catharines*, *St. Stephen* and *Stonetown*, are serving in the Canadian Coast Guard as Department of Transport weather ships, alternating on station in the North Pacific. Their armament has long since been removed and their general appearance radically altered.

The former HMCS *Coaticook* was scuttled after the Second World War to become part of a breakwater at Powell River, B.C. Last fall she was sold for scrap to a Victoria firm and refloated. However, while under tow, she ran into heavy weather and it became apparent she was structurally unsound. The new owners, rather than have her sink at her berth in harbour, decided to have her taken out and sunk. Tis was done in 100 fathoms off Race Rocks on December 14.

Two hundred pounds of explosives were distributed throughout the ship. There was a spectacular explosion that blew the bottom right out and in two minutes she was gone.

Today's modernized frigate displaces 2,360 tons, is 301½ feet over-all in length, 36½ feet in beam and draws 16 feet of water aft. Twin-screw, triple expansion propulsion machinery can drive it up to 20 knots. Armament includes a twin four-inch gun, a twin 40mm and four single 40mm guns and two triple barrelled anti-submarine mortars. The latter give the ships its anti-submarine Sunday punch. The complement is 140 officers and men.

Since conversion and re-introduction to the fleet, frigates have proved themselves reliable on either operational patrols or on training commitments. Atlantic Command frigates, in 1961, steamed more than a quarter-million miles on patrols, exercises and training cruises, the latter chiefly for the training of cadets of the regular force and reserve. During the year, they visited Iceland, the West Indies and seaports in the United States and Canada. Two ships, the *Lauzon* and *Buckingham*, claimed the distinction of steaming 7,000 miles in fresh water last summer while training naval reserves in the Great Lakes.

A few seconds after this picture was taken the Second World War frigate HMCS Coaticook was gone forever, her bottom blasted open by explosives. After serving for years as part of a breakwater at Powell River, B.C., she now lies at the bottom of the sea near Race Rocks. (E-64610)

They Call It 'Avionics'

IN THE 16-YEAR period since Canadian naval aviation came into being rapid changes have occurred not only in the types of aircraft used but in the aircraft carriers that have borne the flyers of the Royal Canadian Navy.

HMCS *Bonaventure,* with her angled flight deck, steam catapult and deck landing mirror, is the third aircraft carrier to be commissioned into the RCN, and from this ship the third set of fighter and anti-submarine aircraft is being operated.

The evolution of Canadian aircraft carriers and aircraft has been marked by giant strides in the use of electrical power.

The RCN's first aircraft carrier, HMCS *Warrior* (1946-48), could produce 1,700 kilowatts. HMCS *Magnificent* (1948-57) needed 400 more. Today, the *Bonaventure* musters more than twice the power of the first Canadian carrier and generates a supply sufficient to serve a city of 20,000.

The main power supply is 220-volt direct current from four 500-kilowatt turbo generators and four 350-kilowatt diesel generators. Eighteen auxiliaries provide special power.

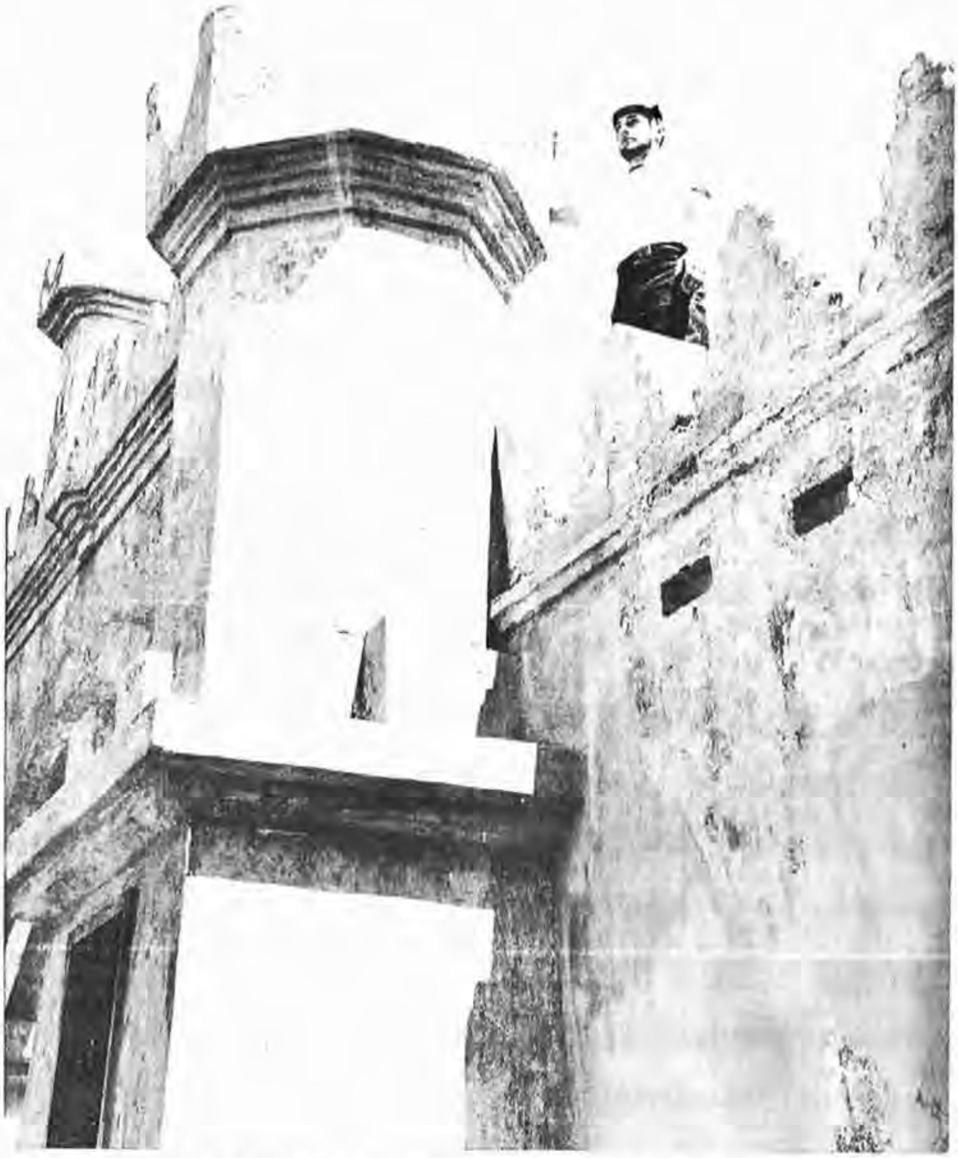
The power is needed for tracking, navigating, communicating, cooking, starting aircraft, laundering, lighting, air conditioning, refrigeration and a host of other functions.

The carrier and aircraft need 20,435 tubes of 436 types, the most common one occurring in 1,129 places. Aircraft use 6,530 of the total, plus 190 transistors. The ship's height-finding radar has the most costly tube, worth $2,118.

So many lights are necessary in this floating hive with its more than 1,200 personnel, that it takes 300 bulbs and 175 fluorescent tubes each month to keep them going.

The 300-line automatic telephone exchange handles a daily average of 4,000 calls during a training cruise, as many as in a town of between 5,000 and 10,000 people, without the dubious benefit of a party-line system.

There are nine radio rooms whose up-to-date equipment includes radio facsimile and teletype. A closed circuit TV system is designed for instantaneous exchange of operational information.



Long vistas into the past often open before the eyes of the sailor in his voyages over seas once sailed by the famous and infamous seamen-explorers of bygone centuries. An old Spanish fort, such as this one at Subic Bay in the Phillippines, can conjure visions of gold and cutlasses, shining seas and far-flung empires. On the parapet is AB Brian Baker, of HMCS Margaree (CCC2-680)

There are three gyro compass systems.

Most common resistors are 82,000-ohm, half-watt types of which there are 999.

The fabulous increase in electrical usage by naval aviation has brought about a problém. The more complex the equipment, the more difficult the maintenance. Electrics, electronics and instrumentation have become so intermeshed the word "avionics" has been coined to cover the lot.

When air squadrons are embarked, about 100 officers and men look after the air and shipboard electrical requirements, under the electrical officer, Cdr. Ronald J. Legeer, who joined the Navy in 1944.

Since casual inspection of complex aerial equipment seldom pinpoints the trouble when trouble occurs, they've developed a maintenance concept, with the airy slogan: "Don't despair; fit the spare."

The "avionics" officer is Cd. Off. John Cottle, veteran of 18 years' naval service.

"The basic principle in avionics maintenance is a quick turnaround," says Cdr. Legeer. "If there's trouble with any complicated piece of gear, say an aircraft has an unserviceable radar, we slip out the offending beast and put in another one. Maybe the fault is just a blown tube, but you don't know and it takes time to find out. The replacement concept makes for much higher serviceability of aircraft earmarked for missions because we don't use shortcut methods."

The Navy takes nothing for granted. Every piece of equipment from the factory is given a thorough bench test.

The twin-engine Tracker anti-submarine aircraft is crammed with radars, radios, direction finders, tactical and navigational aids. The electrical officer of the squadron, Lt. J. Robert Nowlan, has his headaches. But he finds it best to be a "sort of diagnostician". When his technicians have taken out a piece of equipment to find its fault, Lt. Nowlan is there to suggest a new way of tackling the problem when other methods fail.

As the Navy strives to build the bigger and better mousetrap to catch the submarine, its electrical and avionics maintenance personnel will be in the forefront, making sure the trap, no matter how fancy, will work.—H.C.W.

SHIPS SIMULATE NUCLEAR DEFENCE

A BALMY Thursday afternoon and a placid Eastern Atlantic belied the situation as the destroyer escort *St. Croix* and 22 other warships steamed steadily into an area of lethal danger.

Shortly after 1:15 pm, work crackled over the air that this Dawn Breeze task force was about to enter a fallout area where a nuclear bomb had been detonated at 8:30 am. The first of the ships would enter the deadly region at 2 pm.

That is how a convoy began a NBCD phase of the NATO sea and air exercise which started at Gibraltar March 10 and ended there March 30.

On board the *St. Croix* (Cdr. Thomas E. Connors of Montreal), reaction to the theoretical situation was almost instantaneous. Action stations were sounded and the hatches and doors sealed as well as other openings to the outside area. Hoses were turned on and their fine spray mounted into the light breeze which blew the water over the upper decks so that the ship was encased in a fast moving film of water above and below.

The watery envelope slid over the smooth contours taking with it much of the deadly radioactive dust that was supposed to be drifting down from the skies. The radioactive count crept up none the less and guns' crews had to be rotated more rapidly. Most of the ship's company was standing by in the "citadel", an area of maximum protection deep in the ship.

Two large filtration units developed by the Defence Research Board and the Navy absorbed most of the contamination from the outside air brought into the ship. At 3 pm Air Raid Warning Red was received in the ship, which braced for a nuclear attack somewhere in the carefully dispersed force. The *St. Croix* received no structural damage. Hands were safe at nuclear defence stations. Four minutes later monitoring teams were racing through the ship's citadel checking for "some hot spots" and damage control teams closed up three minutes later. At 3.11 the survey teams, wearing respirators, head to toe protective clothing and large rubber gauntlets, went through air-locks to the upper decks to take further readings.

They found three "hot spots" and decontamination squads went to work with hoses and scrubbers to rinse away the small but dangerous accumulations of radioactive dust. On the silent, wet and lonely upper decks and around the immobile guns they made an eerie sight under a soft sky and spring sunshine.

The teams withdraw, stripped off their polluted garments and showered meticulously in special stalls before resuming their shipboard duties. Life in the *St. Croix* became closer to normal.

In the rest of the warships more or less the same went on depending on whether they had received theoretical damage in the second blast.

Nothing is really new under the sun and this applies to naval warfare. The havoc of the nuclear threat multiplies the age-old hazards of blast and heat which have accompanied sea battles. The one new factor is radioactivity which the Dawn Breeze ships were practising to overcome to the fullest extent and so live to fight another battle.

The roles they played were well rehearsed. New ships reflect the new danger in their altered design. The *St. Croix* is streamlined to get rid of the deadly dust quicker. She has other means of defence in her layout and equipment. Most of all, her officers and men are educated to the new threat by courses in special schools ashore, by training on board and by practising as was done that afternoon on a fleet-wide basis.

Admiral Tells of Submarine 'Kill'

Admiral Sir Wilfrid Woods, NATO Commander in Chief Eastern Atlantic, said at the close of the five-country air and sea NATO Exercise Dawn Breeze Seven that co-operation was "excellent". He also revealed how ships of three navies combined to "sink" a submarine.

The British admiral told of an attack being attempted by a submarine on the French carrier *Clemenceau*. The sub was detected by a French destroyer whereupon a Canadian and British warship each joined in and ensured its "kill".

The Canadian destroyer escort was HMCS *Gatineau* (Cdr. A. H. McDonald), one of five sister-ships of the Fifth Canadian Squadron from Halifax which took part in Dawn Breeze March 10-30. The *Gatineau* formed part of the *Clemenceau's* protecting screen at the time.

More than 30 warships from Britain, France, Canada and The Netherlands with 12,000 personnel were involved. Among the participating aircraft were Neptunes of the Portuguese Air Force which flew from their own soil. The other shore-based aircraft operated from Gibraltar.

Admiral Woods made his disclosures at a press conference soon after the ships returned to Gibraltar from the final phase.

Utility Squadron Wins Air Trophy

Naval Air Squadron VU-32, based at HMCS *Shearwater*, has been awarded the Wilkinson Trophy for 1961. The award is made annually to the RCN unit which contributes most to the efficiency and effectiveness of the navy in naval aviation.

The trophy, a silver model by a Seafire aircraft, was presented for competition by David Wilkinson, DSC, of Brook, Surrey, England, who, in 1946, as a lieutenant-commander, RNVR, commanded the RCN's first fighter squadron, 803.

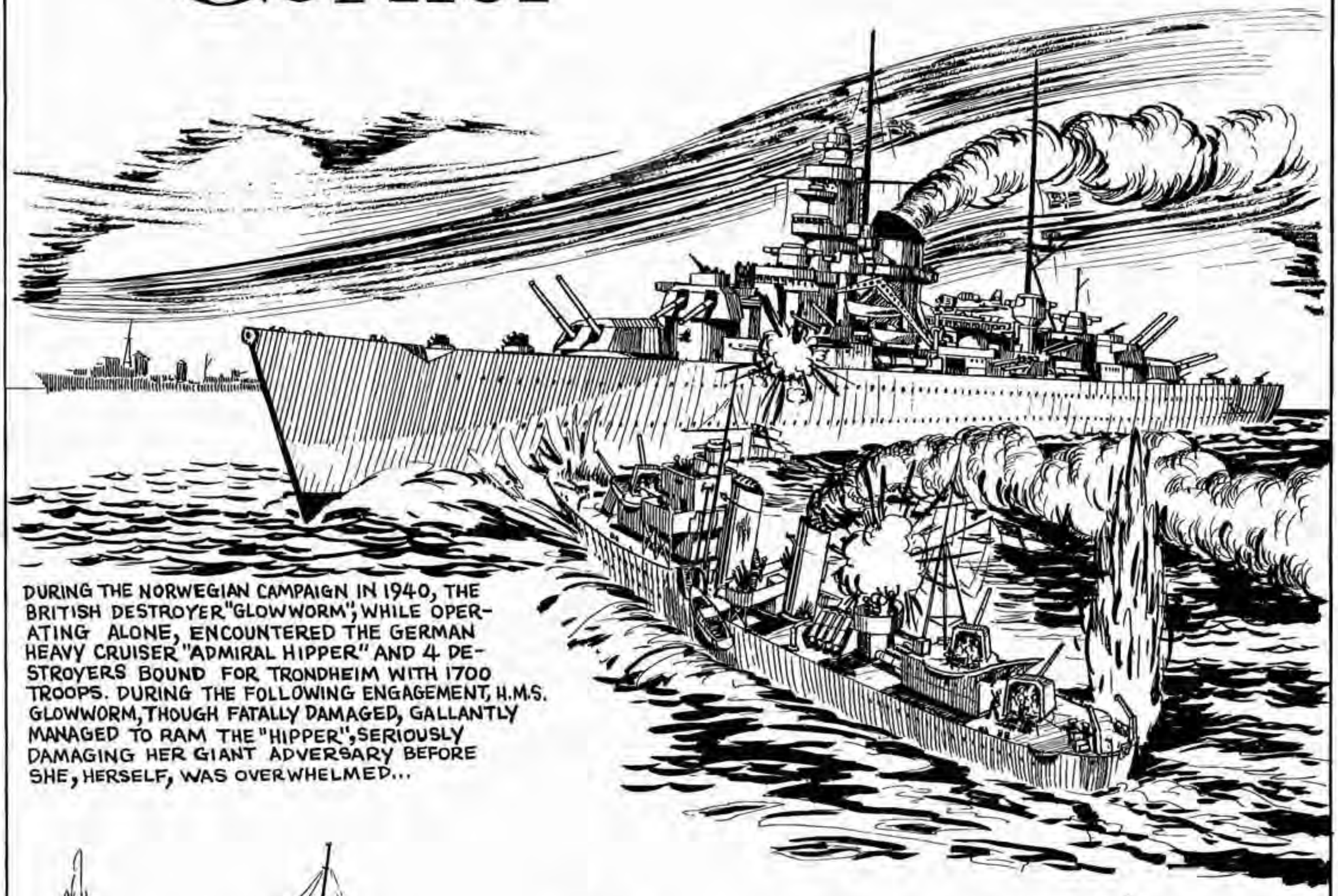
Since 1958, the trophy has been won by VX-10 (experimental), HS-50 (anti-submarine helicopter) and VF-870 (jet fighter) squadrons.

VU-32 is commanded by Lt.-Cdr. Steward R. Linquist. The squadron, equipped with Tracker anti-submarine aircraft and Silver Star jet trainers, carries out advanced pilot training and fleet utility duties.

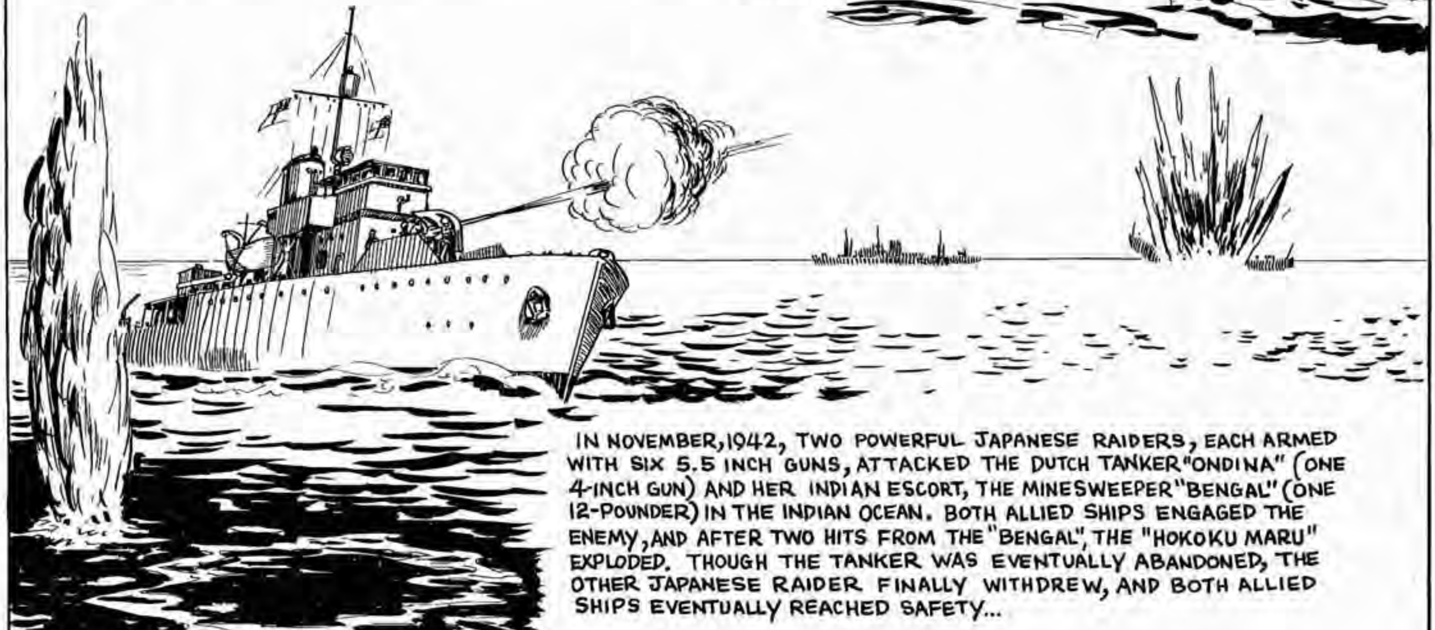
Naval Lore Corner

Number 104

"DAVIDS AND GOLIATHS"
TWO EPISODES OF SMALL SHIPS ENGAGING TREMENDOUS ODDS...



DURING THE NORWEGIAN CAMPAIGN IN 1940, THE BRITISH DESTROYER "GLOWWORM", WHILE OPERATING ALONE, ENCOUNTERED THE GERMAN HEAVY CRUISER "ADMIRAL HIPPER" AND 4 DESTROYERS BOUND FOR TRONDHEIM WITH 1700 TROOPS. DURING THE FOLLOWING ENGAGEMENT, H.M.S. GLOWWORM, THOUGH FATALLY DAMAGED, GALLANTLY MANAGED TO RAM THE "HIPPER", SERIOUSLY DAMAGING HER GIANT ADVERSARY BEFORE SHE, HERSELF, WAS OVERWHELMED...



IN NOVEMBER, 1942, TWO POWERFUL JAPANESE RAIDERS, EACH ARMED WITH SIX 5.5 INCH GUNS, ATTACKED THE DUTCH TANKER "ONDINA" (ONE 4-INCH GUN) AND HER INDIAN ESCORT, THE MINESWEEPER "BENGAL" (ONE 12-POUNDER) IN THE INDIAN OCEAN. BOTH ALLIED SHIPS ENGAGED THE ENEMY, AND AFTER TWO HITS FROM THE "BENGAL", THE "HOKOKU MARU" EXPLODED. THOUGH THE TANKER WAS EVENTUALLY ABANDONED, THE OTHER JAPANESE RAIDER FINALLY WITHDREW, AND BOTH ALLIED SHIPS EVENTUALLY REACHED SAFETY...

J. M. THORNTON

Roger Duhamel

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