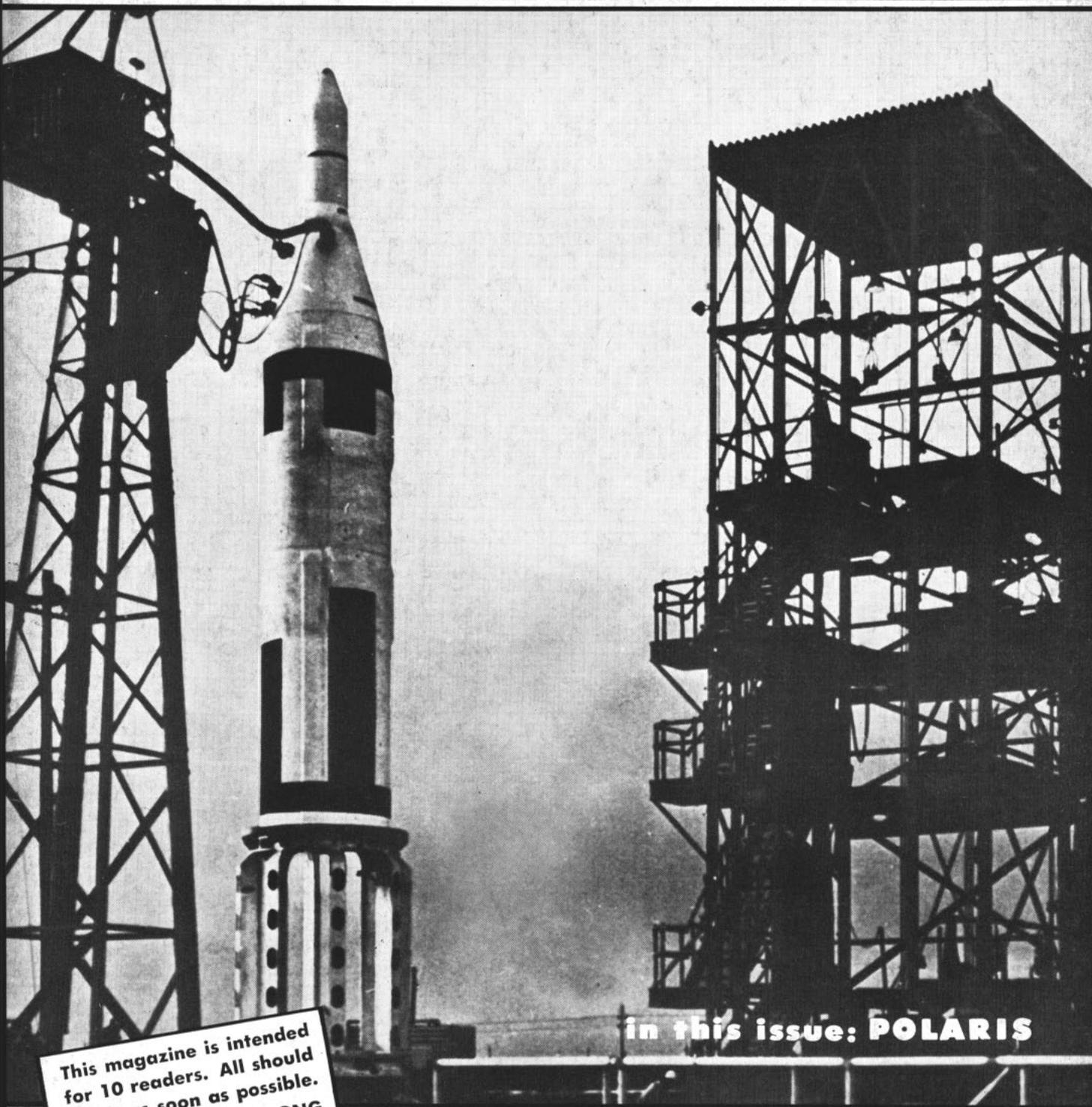


ALL HANDS



This magazine is intended
for 10 readers. All should
see it as soon as possible.
PASS THIS COPY ALONG

in this issue: POLARIS

JANUARY 1960



ALL HANDS

THE BUREAU OF NAVAL PERSONNEL INFORMATION BULLETIN

JANUARY 1960 Nav-Pers-O NUMBER 516

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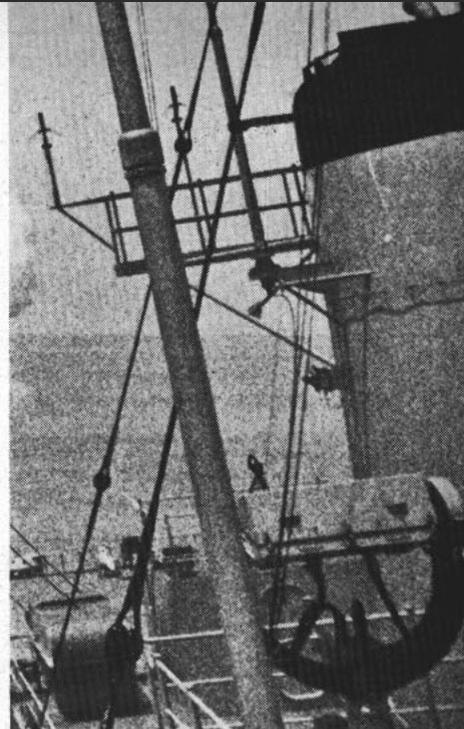
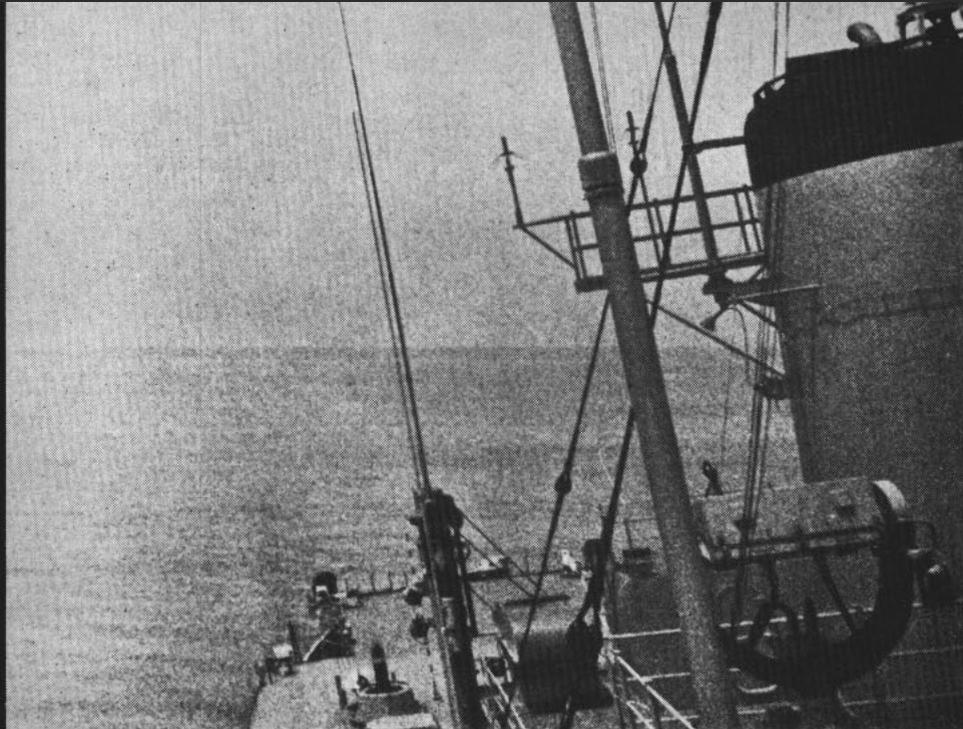
French Crawford Smith, Reserve

Don Addor, Layout

● **FRONT COVER: OUT OF WATER**—Navy's solid propellant Fleet ballistic missile *Polaris* stands on gantry at Cape Canaveral just prior to test flight. The missile, when carried by a submarine, can be fired while the sub is submerged.

● **AT LEFT: FLEET'S IN**—Emerging from fog banks, the First Fleet enters San Francisco Bay. In line are *USS Midway* (CVA 41), *USS Kearsarge* (CVA 33) and *USS Hancock* (CVA 19) passing under the Bay Bridge. Photo by Al Labendz, PHC, USN.

● **CREDITS:** All photographs published in **ALL HANDS** are official Department of Defense Photos unless otherwise designated. Photo at top right corner of page 9 is by World Wide Photos, Inc.



IT'S POLARIS FOR

THE PROBLEM: The oceans are neutral. They take no part in the struggles between them.

Yet for many years after the founding of this nation, the United States found the ocean to be its ally. In time of peace, the Atlantic and the Pacific insulated us from the quarrels of Europe and Asia. In time of war, these same oceans protected us against direct enemy attack and

furnished a convenient highway for men and material.

It was different in World Wars I and II. Then, it was our enemy as well as our friend. In each instance, German submarines came close to defeating the Allies. Closer than most people realize.

Because of the introduction of two new elements—the nuclear-propelled submarine and the submarine-

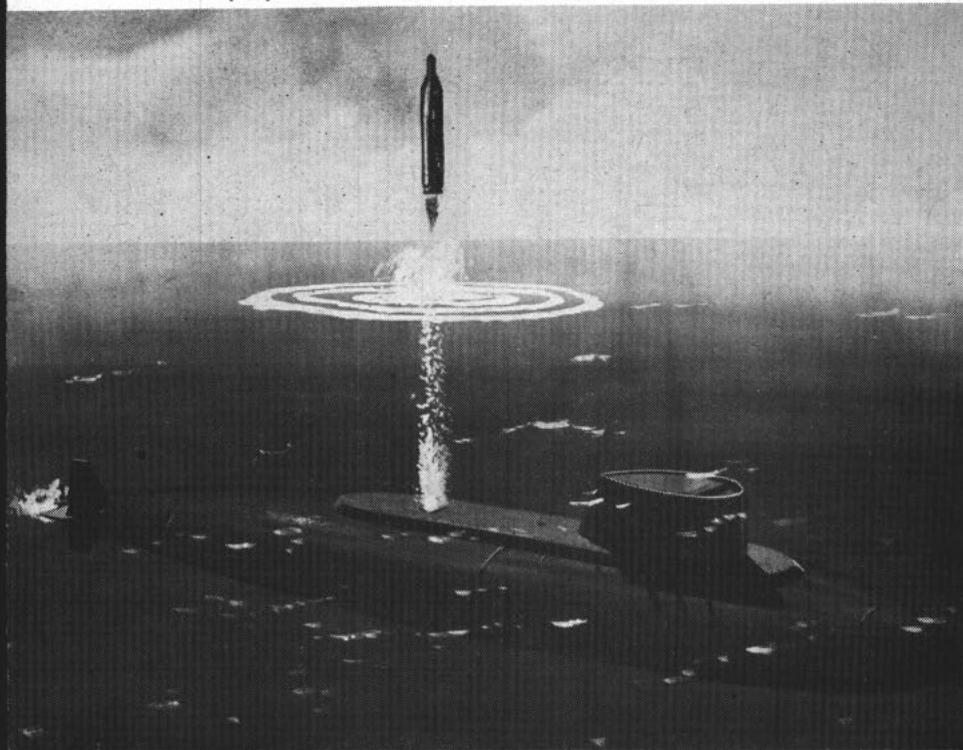
launched intermediate range ballistic missile—the ocean can be an even greater enemy.

An attack by a single missile-launching submarine, equipped with missiles with hydrogen warheads, could decimate several of our major cities. A major attack could shatter our society beyond recovery.

The day is rapidly nearing when an enemy will possess, first a few, and then a large fleet of intermediate-range ballistic missile-launching nuclear-propelled submarines.

As the situation now stands, we just simply couldn't stand such an attack.

UP AND AT THEM—Artist's conception drawn in the early phases of the *Polaris* project shows the missile being fired from beneath the surface.

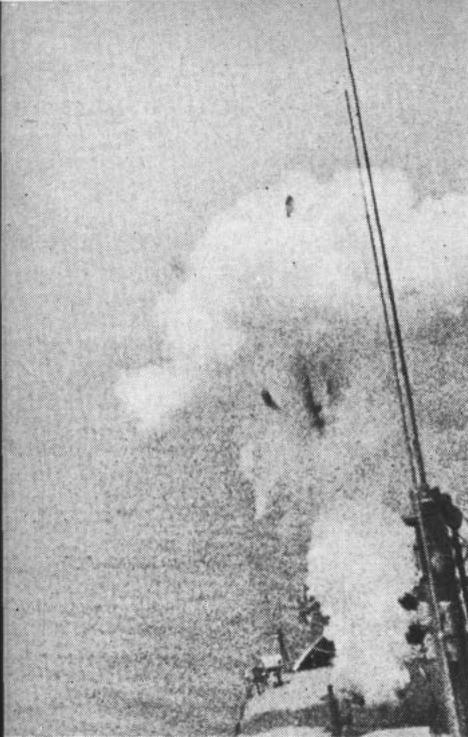


BUT—if we were to possess a similar fleet of missile-launching submarines, we could, if need be, also inflict a similar attack against an aggressor. Our present philosophy is based upon the conviction that, as long as we possess this possibility of a deterrent force, no enemy will dare attack us.

To make this defense work, we face three problems in underseas warfare. One is old; two are new.

- The first is: How can we best carry out the traditional mission of the Navy? We are a part of a maritime confederation. Its survival—and ours—depends on the uninterrupted transportation of materials and peo-

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ple across the oceans and the control of areas near sea coasts. The Navy must still keep the oceans open for friendly ships and bring superior concentration of power to bear on coastal areas in other regions of the world.

- Second: How best protect the cities, factories and military installations of this country against the threat of missile-launching submarines? In a few years, the threat of strategic attack from the sea may equal in danger the threat of attack from land-based manned bombers and intercontinental missiles.

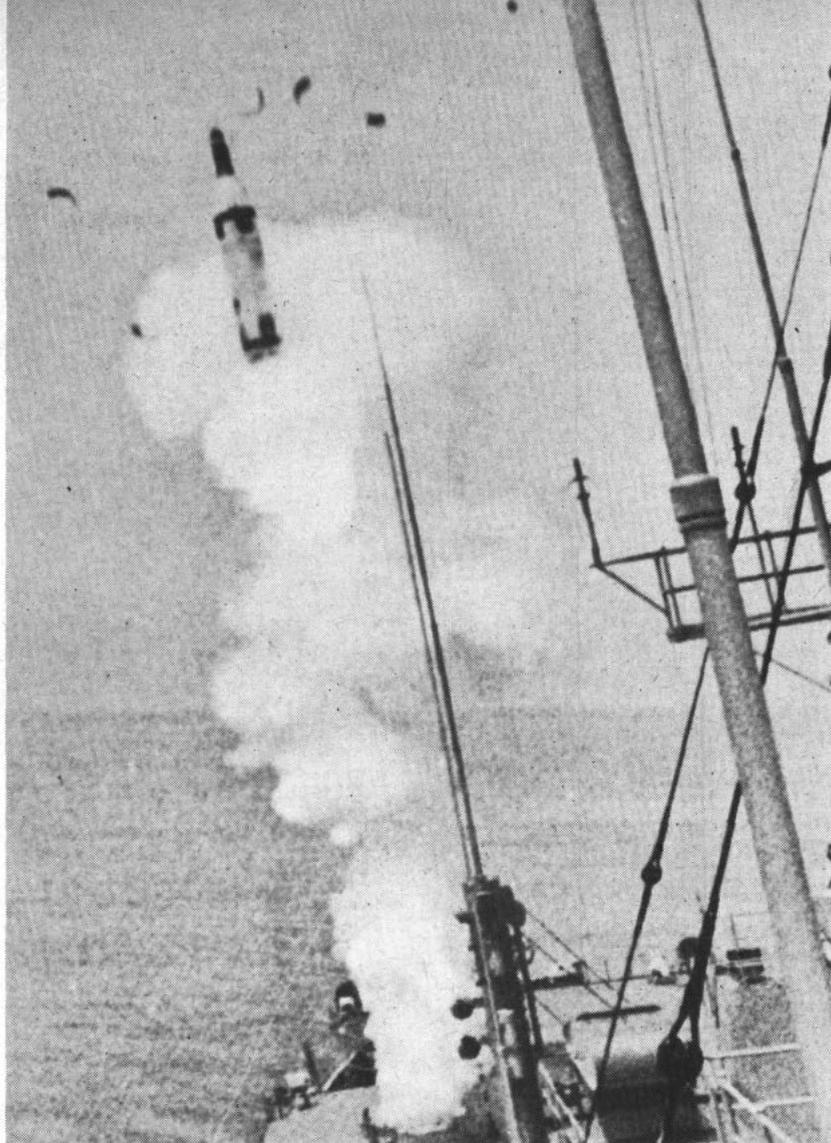
- And third: How are we going to exploit the new power of submarine-launched missiles to increase our own strength?

THE DANGER—At the present time, there is only one nation—the Soviet Union—which is in a position to challenge our naval supremacy. Our planners would be neglecting their responsibilities if they did not visualize the possibility that these forces might some day be used against our country.

Here's the situation:

At the moment, the Soviet submarine force consists of an estimated 475 conventional-power vessels.

At the height of World War II, we faced 440 German U-boats not



GOING UP—Polaris roars from deck of *USS Observation Island* (AG 154) during first test firing of the FBM submarine missile from a ship at sea.

equipped with snorkels, with limited underwater endurance, and with a top underwater speed of some 12 knots. To combat this force, we had a total of 950 ocean-going escorts and 2200 ASW aircraft.

This compares with about 300 escorts and about 700 ASW aircraft operating today.

Numerically speaking, the situation does not look good for us. It is assumed that if all-out war broke out within the next year or so, the Soviet diesel-electric submarine fleet could inflict very severe damage on allied naval forces.

We must also presume that the Soviets will soon possess nuclear submarines which can fire ballistic missiles. It is estimated that the first of these will be in operation in 1962.

Our present line of defense is relatively close to our coasts. To counter the threat of these missile-launching

submarines, we must develop barriers against them at distances from our coasts greater than the range of their missiles.

Nuclear-propelled missile-firing submarines will be much more difficult to destroy than conventional craft—and they are more dangerous. Kill rates which would be tolerable for meeting the threat to shipping—as was the situation in World Wars I and II—are not good enough for countering the underwater missile threat.

Unless countermeasures not now in existence become available, an attack could be mounted from the sea against the cities of the United States some time in the early 1960s.

As appraised in this fashion, the situation, doesn't look so good. What do we have to offer as a possible answer?

We have, in addition to an anti-



FROM DOWN UNDER—Submarines armed with *Polaris* will form mobile underwater missile pad that can launch an attack reaching enemy inland targets.

submarine warfare technique, the *Polaris* weapon system.

THE ANSWER: Nuclear propulsion is revolutionizing sea power just as steam did a century ago. The missile is revolutionizing warfare much as the airplane did a generation ago. Nuclear explosives are causing great

changes in our thinking than gunpowder did in the 14th century.

The U. S. Navy has developed a new weapons system that combines all three elements of the present revolution in military technology. This is *Polaris*, an intermediate-range ballistic missile (IRBM) cap-

What is *Polaris*?

The *Polaris* missile is a two-stage solid-propellant missile designed to be launched from submarines, either surfaced or submerged, or launched from surface ships or from shore.

The primary means of launching *Polaris* will be from Fleet Ballistic Missile (FBM) submarines designed especially for this purpose. Submarine personnel can check and prepare missiles for firing from within the submarine while submerged. A solid-type propellant system and the fire control equipment will permit missiles to be launched rapidly and on short notice.

Ejected from its launching tube by inert gases, *Polaris* is forcefully propelled above water where the missile motor ignites. The missile continues on its own power until its thrust is ended by a signal from the missile guidance system.

After arrival at the correct speed and at the correct point in space, the second-stage motor thrust comes to an end, and the re-entry body then continues along the pre-planned trajectory to the target. The missile will have an initial range of over 1200 miles.

Up to the present, the development of *Polaris* has progressed satisfactorily and ahead of schedule with approximately 20 flight tests having been conducted. The missile has been successfully flown in excess of 900 miles and successfully fired at sea from *USS Observation Island* (AG-154).

It is estimated that a "shipload" of 16 *Polaris* missiles can be manufactured (at the present stage of development) for about \$20 million, or some \$1,300,000 per weapon. Approximate cost of a Fleet ballistic missile submarine is about \$93,000,000.

able of carrying a nuclear warhead that can be fired from a submerged nuclear-powered submarine for a distance up to 1500 miles.

Polaris will at the very least be a major supplement to the United States capability for deterrence. It may be more of a deterrent than the conventional intercontinental ballistic missile (ICBM). As the number of long-range rockets in the enemy's arsenal increases, the capability of either our manned bombers or missiles, operating from fixed bases, to provide the necessary retaliation, becomes less. As time goes on, we will have to rely more and more on missiles for this retaliation.

An effective retaliatory force should meet the following standards:

- The enemy should fear it. It should be able to reach any enemy target.
- It should be so located that attempts to destroy it before it is launched would not also cause damage to non-military targets.
- It should be invulnerable to all forms of enemy attack, including ballistic missiles.
- Its launching points should be such that they cannot be located accurately in advance by an enemy, and such that most probable trajectories cannot be calculated in advance by an enemy.
- After it is launched, it should be relatively invulnerable to counter-measures.
- It should be as invulnerable as possible to enemy efforts of sabotage.
- The time between the decision to fire and actual launching should be as small as possible.
- It should complicate the enemy's defense problems so much that he can never really be sure that he does have a defense.

IT WAS UPON these standards that the *Polaris* submarine weapon system was developed.

At present, plans call for a relatively few nuclear submarines stationed at points in the Atlantic, Arctic, Pacific and Indian Oceans, the Mediterranean Sea and the Persian Gulf. Without surfacing, a sub crew will be able to launch sixteen missiles up through the water and into the sky within 15 minutes.

In short, *Polaris* provides us with a system of mobile, fully concealed missile-launching bases wholly under our own flag and control. They will enable us to shift the weight of our military firepower from one area

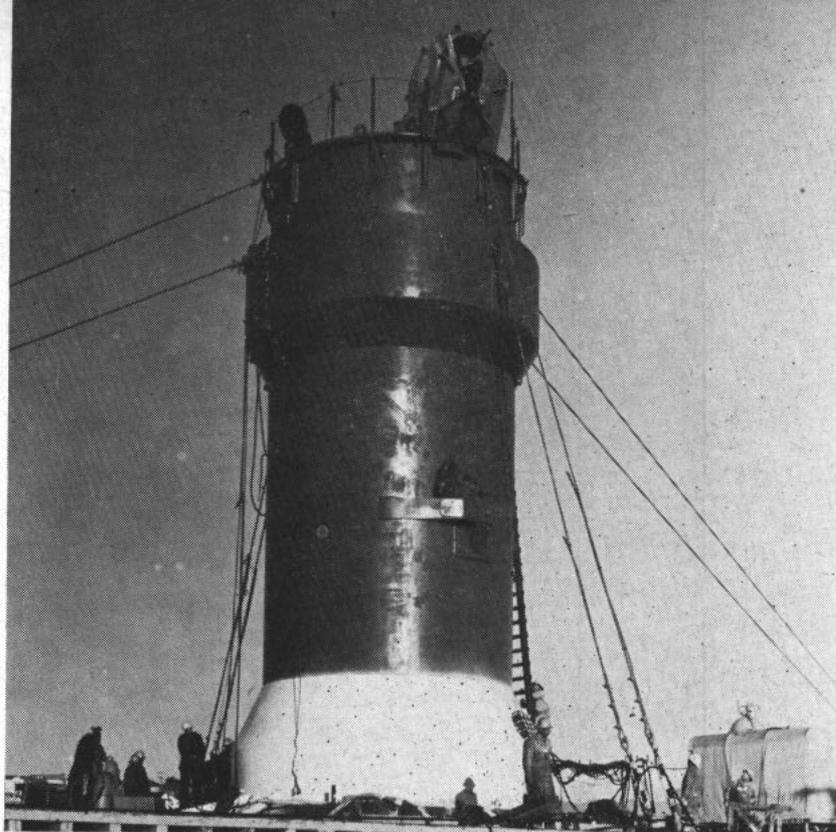
to another, quickly and secretly, adding strength where it is needed.

Polaris will bring within range of direct attack from the sea almost all important military targets. It can reach these targets in some 15 minutes from the instant of firing. With a relatively small number of submarines on station, dozens of *Polaris* missiles, with nuclear warheads, can be on their way immediately.

With their worldwide cruising radius, nuclear-powered submarines can patrol for months at a stretch, move submerged at high speeds and will be almost impossible to locate.

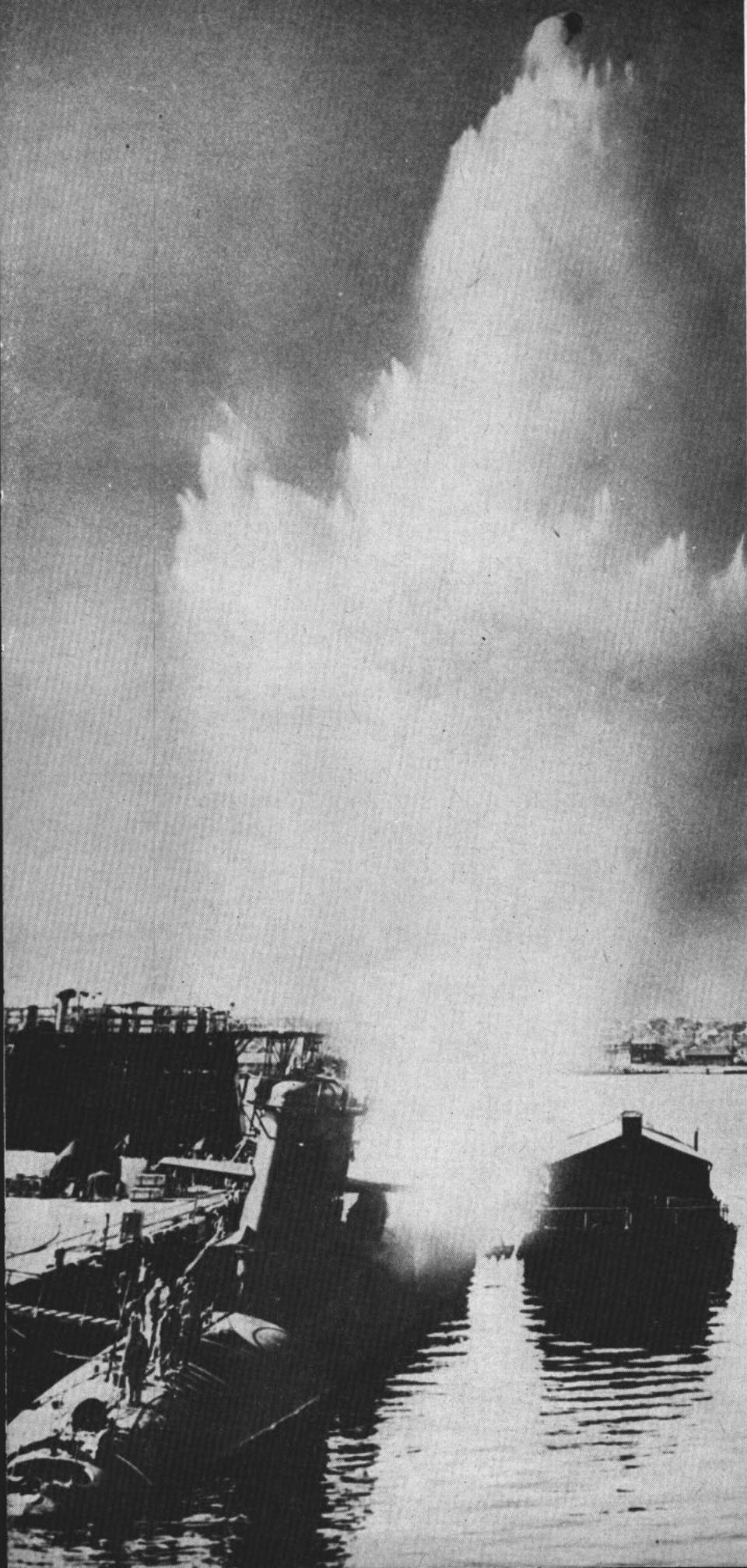
The very knowledge that they are there, within range and ready, will exert a strong deterrent influence on any leadership, however reckless.

Thus, *Polaris*-launching submarines, constantly moving under water to avoid detection, are one deterrent force that can get through an enemy's screen of interceptor missiles and cannot be wiped out by a sudden, unexpected missile attack.



SEA TACTICS—Navymen hold war games with electronic fleet on Navy Electronic Warfare Simulator (NEWS) at Naval War College, Newport, R. I. Above: Strange looking device is *Polaris* launching tube used in tests.





IT'S HERE —

FLEET

TODAY A NEW BREED of Navymen sails a radically new ship. A ship that introduces a new concept of naval power and has a mission as challenging as any that has ever confronted seafaring men in peace or war.

This is the Fleet Ballistic Missile submarine. It represents a partnership between two of the most revolutionary technical developments of our time—the nuclear-powered submarine and the ballistic missile.

USS *George Washington*, SSB(N) 598, is the Navy's first FBM submarine. She was commissioned on 30 Dec 1959. *Patrick Henry*, SSB(N) 599, is the second and *Theodore Roosevelt*, SSB(N) 600, the third. They will all be operational before the end of this year.

Then there's *Robert E. Lee*, SSB(N) 601, *Abraham Lincoln*, SSB(N) 602, and *Ethan Allen*, SSB(N) 608. They are scheduled to be commissioned in September and December 1960 and June 1961 respectively, and will join the Fleet during 1961.

In addition, *Sam Houston*, SSB(N) 609, *Thomas A. Edison*, SSB(N) 610, and *John Marshall*, SSB(N) 611, are being built. They will be launched next year and will go into service in 1962.

At present, these nine FBM submarines are the only ones that have been authorized. Long-range plans, however, call for a Fleet of approximately 40 ballistic missile submarines capable of carrying hundreds of *Polaris* missiles. *George Washington* and other FBM subs now under construction have 16 vertical tubes for launching *Polaris* missiles.

This Fleet will comprise a portion of this country's deterrent retaliatory strength. It will confront any potential aggressor with serious problems and make him take a second look.

WHAT IS THE FBM submarine? Let's take a closer look at *George Washington* and see for ourselves.

Physically, *Washington* is an un-



BLAST OFF—USS *George Washington* shoots test cylinder skyward during test of *Polaris* missile-firing system.

ALL HANDS

BALLISTIC MISSILE SUB

usually long and heavy submarine, even by atomic standards. This black, blimp-shaped underwater monster is 380 feet from bow to stern and displaces 5400 tons on the surface and 6700 tons submerged. It cost about 110 million dollars to build. Her hull was patterned after USS *Skipjack*, SS(N) 585, the high-speed atomic sub which shattered all existing speed and depth records.

An all-out effort went into building *Washington*. Wartime phrases like "top priority," "urgent" and "rush" became as commonplace in the shipyard that built her as did six- and seven-day weeks and 12-hour days for the designers, engineers, construction workers and crew who completed her in jig time. Our first Fleet ballistic missile submarine went from the drawing boards to launching in just 14 months after design specifications were approved.

The urgency of the FBM program required *Washington's* builders literally to split open the hull of the attack submarine *Scorpion*, SS(N) 589—then under construction—and insert her *Polaris* launching tubes; then turn the existing hull into that of *Washington*—about 130 feet longer than the *Skipjack* class sub that was originally on the building ways.

The story of *Washington's* construction—which packs missile-launching pads and blockhouses into a comparatively few feet amidships—goes back to January 1958 when the Navy proposed further augmentation, calling for a nine SSBN capability by the end of 1961.

The preliminary designs and specifications of *Washington* were completed in less than two months after the Navy awarded the contract for construction of the first two FBMs. From that point on, it was a nip and tuck race between the designers and the shipbuilders. Requiring over 3300 separate plans, the designers were barely able to keep ahead of the yard workers.

OVER 2500 TONS OF STEEL, 70 miles of cable, 105,600 feet of pipe, 67 tons of weld metal, 118 electric motors, 50-ton gyro stabilizers, as well as the nuclear reactor and its shielding, and scores of new types of electronic computers and

navigational devices went into *Washington*.

The SSB(N) 598 is a precedent-setter. Take its name for example. The Navy broke a tradition as old as the submarine service itself, when it named its first Fleet ballistic missile submarine. (Traditionally submarines have been named for fish.) *Washington* is the first U. S. submarine since 1900 to be named for a person.

When the Navy acquired its first submarine in 1900, it was named *Holland* in honor of John P. Holland, its designer and builder. Immediately thereafter, the Navy began naming submarines for fish and sea creatures.

This practice of naming subs after creatures of the sea pre-dated the Navy's submarine force. David Bushnell, the Connecticut Yankee who built a one-man submersible in the Revolutionary War, called his craft *Turtle*. Then some years later Robert Fulton built a submarine which he named *Nautilus*.

In 1911, with a growing submarine Fleet, the Navy abandoned the practice of naming its underwater craft, and began to designate them by a letter-number combination. This practice prevailed until the early 1930s when the Fleet-type subs went into production.

With these Fleet boats, which bore the burden of underseas operations during World War II, names of fish were again used. The advent of the post-war nuclear Navy found submarines—such as *Nautilus*, *Seawolf*, *Skate* and *Skipjack*—still named for fish and other forms of sea life.

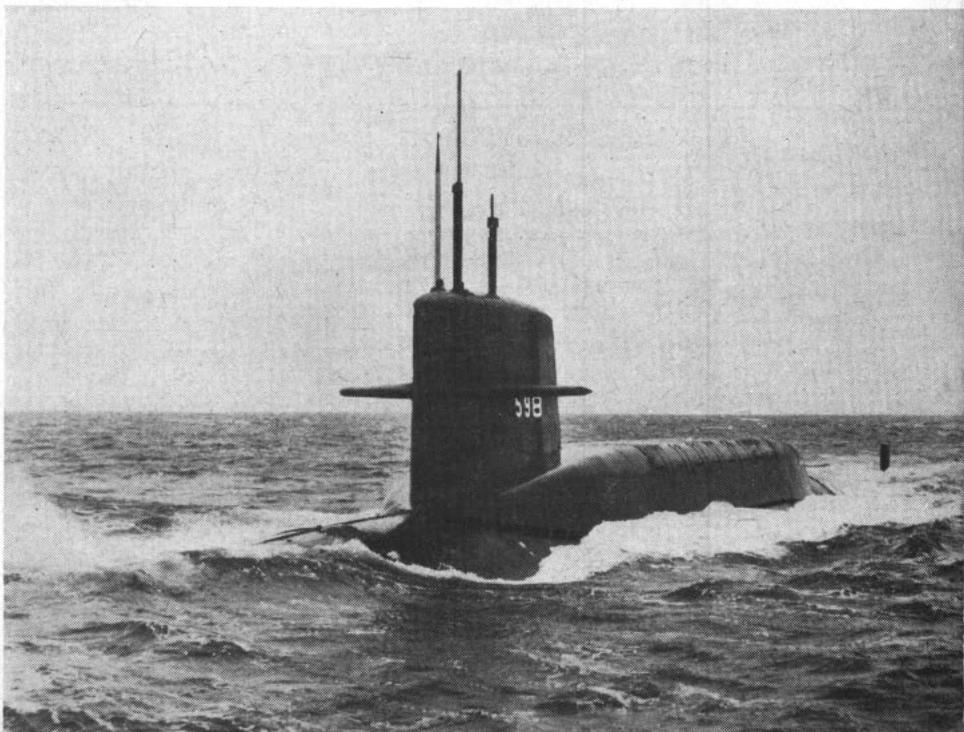
However, the Fleet ballistic missile subs posed a unique problem for the Navy, principally because they were to be strategic rather than tactical weapons.

A variety of names for the new class of submarines was proposed, such as states, cities and submarines lost in World War II. The Navy finally settled on famous Americans known for their dedication to the cause of freedom. *George Washington*, appropriately enough, was the first.

WHILE THE MASS of steel and machinery was beginning to take the form of a ship, *George Washington* was assigned to Submarine Squadron 14—making it the first ship in naval history to be assigned to a Fleet unit even before it was built.

There was sound reasoning behind this assignment since the job of the paper squadron was to work out detailed training programs and

MISSILE MASTER—Navy's first Fleet Ballistic Missile submarine, USS *George Washington*, SSB(N) 598, revs up her atomic engine on shakedown cruise.





FLEET ballistic submarine sailors get to know their sub on circuit trainer.

operational tactics for the FBM submarines and their crews—a task which does not require a ship in the initial stages.

SUBRON 14 became operational in the Pentagon at Washington, D. C., back in July 1958. It is scheduled to shift to New London, Conn., its home port, in the near future.

Heading SUBRON 14 is Captain Norwell G. Ward, USN, a veteran submariner; Capt R. G. Anderson, USN, a pioneer in submarine-launched missiles, is his Chief Staff Officer. Many of the details concerning this unusual squadron are highly classified since it is primarily concerned with strategy and tactics.

As commodore of SUBRON 14, CAPT Ward eventually will have nine FBM submarines, a specially converted sub tender, and over 2500 Navy men under his command.

Because the mission of SUBRON 14 will be primarily strategic, as distinguished from the tactical operations of attack submarines against

other submarines and surface ships, the over-all assignment of the squadron's missions rests directly with the CNO and the Joint Chiefs of Staff.

ANOTHER PRECEDENT that *Washington* claims is her Blue and Gold crew concept. *She will be assigned two commanding officers and two complete crews*—CDR James B. Osborne, USN, is CO of *Washington's* Blue crew, while CDR John L. From, USN, will be skipper of the Gold crew—each consisting of 10 officers and 90 enlisted men.

The Blue crew, after undergoing extensive training, reported aboard *Washington* at Groton, Conn., last June, while the Gold crew reported in September. Since then, both crews have been working around the clock, getting the mobile missile base ready for sea.

Before and after reporting to *Washington*, both the Blue and Gold crews received identical training in the nuclear power plant, the *Polaris*

missile and other aspects of the new submarine. (See page 14.)

The two-crew concept was adopted for *Washington* and other FBM submarines because they are slated to be on station almost constantly. Nuclear submarine operations are limited only by human endurance as demonstrated by the polar cruise of *uss Nautilus* SS(N) 571, and *Skate*, SS(N) 578, and the 60-day submerged cruise of *uss Seawolf*, SS(N) 575.

While one crew is at sea, the other will be ashore for rest, recreation and training at the FBM training facility at New London.

UNPRECEDENTED, too, is the mass of new shipboard equipment.

Washington's mission requires her to stay out of sight and sound. But to do this, the CO must have reliable methods of determining his position in reference to destination and potential targets. Thus, the most comprehensive battery of navigational instruments ever assembled in one ship has been installed in *Washington* and her sister ships.

Basic reference for *Washington's* navigators (LT William H. Cossa-boom, USN, Blue; and LT William P. St. Lawrence, Jr., USN, Gold), will be the Ship's Inertial Navigation System (SINS). SINS enabled *Nautilus* and *Skate* to reach the North Pole under the polar ice cap. Three sets of SINS are installed in *Washington*—each one constantly checking the reliability of the others.

Nothing is left to chance. Navigators have at their fingertips many methods of obtaining information. They also have conventional equipment such as radar, magnetic compass, gyro compass and dead reckoning tracers.

The FBM subs are also equipped with a "TV-eye" for under-the-ice operations. This closed-circuit television system enables the crews to "see" the perpetually dark underside of the polar ice pack.

Although underwater TV assures *Washington* and other FBM subs of safe sailing under the ice, FBM subs are also fitted with special stabilizing equipment that guarantees them smooth sailing even in storm seas while on the surface. They are equipped with an automatic torque-resisting device known as a gyro-stabilizer that is mounted within the ship's hull. A sensing gyroscope

Nuclear Subs Should Stock Up on Alphabet Soup

When *uss George Washington*, our first Fleet Ballistic Missile submarine, was commissioned on 30 Dec 1959, the alphabet symbolizing the Navy's Nuclear Fleet was increased.

Washington's SSB(N) designator was added to a list that already includes SS(N), SSR(N) and SSG(N).

For the uninitiated, "SS" is the designation for submarine. The parenthetical "N" denotes nuclear powered. So far, the "R" is applied to only one nuclear sub—*uss Triton*, SSR(N) 586. It stands for

radar-picket. The "G" designates subs designed for launching the *Regulus* guided missile. Now being used in the Fleet.

The latest, "B" represents ballistic-missile firing and is applied to a new class of submarines of which *Washington* is the lead ship. This class is capable of firing the 1500-mile *Polaris* missile from either surface or submerged positions.

Washington, the SSB(N) 598, and her sister ships are 380 feet long and displace 6700 tons while in a submerged position.

picks up the first indication of a rolling motion and activates a hydraulic system which resists the rolling force of wave action and keeps the 380-foot submarine on an even keel.

ANOTHER WATCH DOG aboard *Washington* is the complex of electronic brains which make up the missile control station. Here are the devices which will maintain a constant check on the operational readiness of the missiles stowed in their launching tubes. Light signals warn of substandard conditions in any part of the system.

Each of the 16 *Polaris* missiles and their subsystems aboard *George Washington* will receive regular checks by the diagnostic electronic brains.

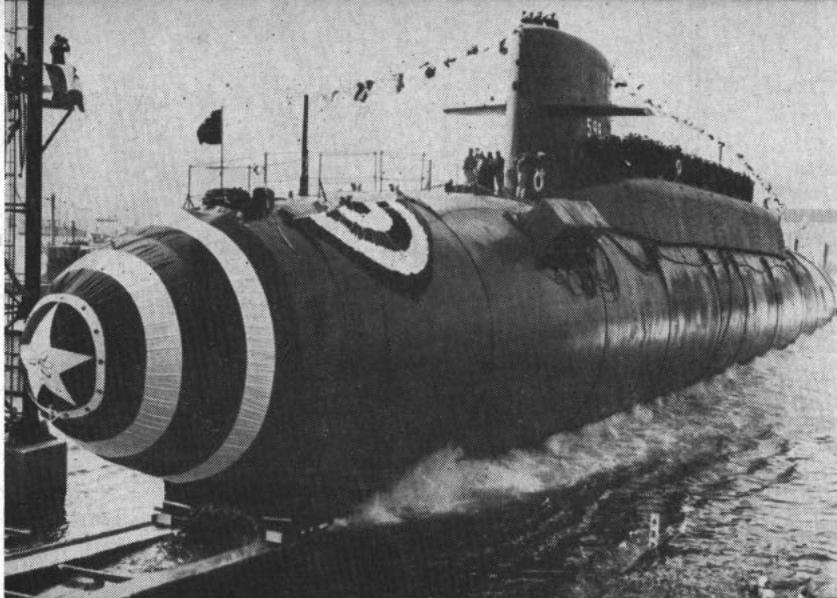
When the *Polaris* ballistic missiles shoot out of the vertical launching tubes aboard *Washington* and are projected into space, the Diving Officer and Chief of the Boat manning a panel in the submerged ship must keep the sub from recoiling like a howitzer.

Although *Washington* will not become fully operational for another four months, all eight of her engineering officers have already experienced what it's like to stabilize a 380-foot sub when the 30-foot missiles are sent aloft.

During this training, each engineering officer and Chief of the Boat was given a near-hurricane sea condition under which to work and they were still able to perform adequately. A maze of red lights showed which missile had been selected to be fired. When the firing system was ready, the tube doors on deck were opened and the "bird" was on its way.

At the instant of launch, dials whirled to indicate tons of water being blown out to compensate for water pouring into the space vacated by the missile. An automatic compensation system accounted for this weight differential between missile and water but wave action and temperature gradients of the water at various depths still had to be counteracted.

For example: A one-degree temperature change can make a large difference in the ship's submerged weight and, since the water temperature changes at various depths, the ballast control operator must compensate by taking in or blowing out water to stabilize the submarine.



THIS IS NUMBER TWO—USS *Patrick Henry*, SSB(N) 599, slides into the water.

IN ADDITION to carrying *Polaris* missiles for their primary deterrent role, *Washington* and other FBM submarines—like all other naval units—will perform other tasks. For instance, they will be good underwater listening posts; they will have active and passive sonar gear which makes them effective ASW weapons; and they will be armed with torpedoes for defense as well as for offensive purposes.

Washington has a fire control system which features an electronic brain that controls the torpedoes fired from her four bow tubes. This system is built around a computer that can go into action instantaneously. Can be operated by one man in emergency situations.

Using sonar or a combination of several sensing devices the system can determine an enemy ship's position, direction and speed. The geometric problems involved in cal-

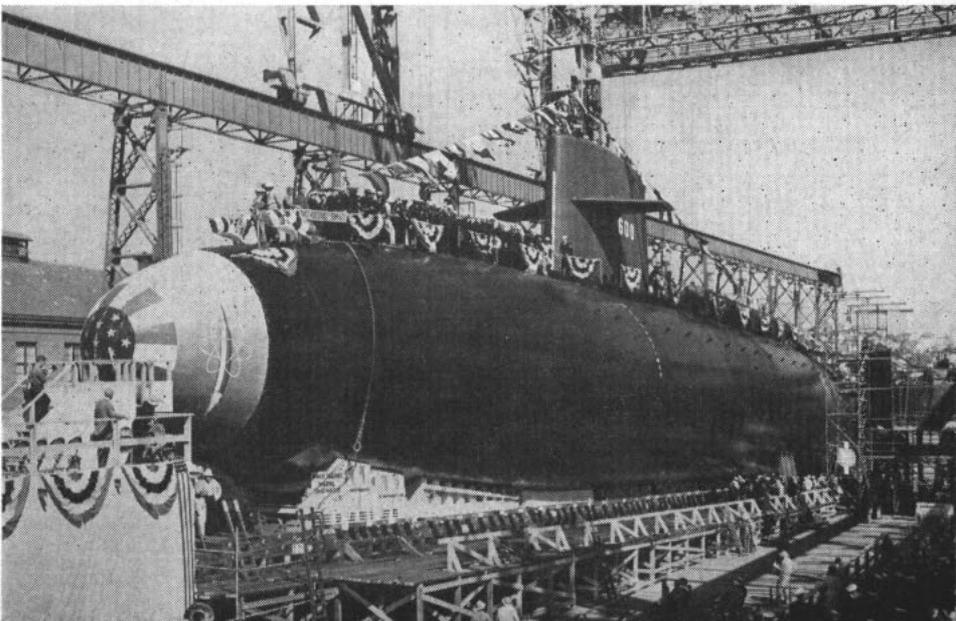
culating the best means of aiming the torpedo to hit the enemy ship are then solved by the computer. The operator is signaled when a solution has been obtained and then all he has to do is to push the appropriate button.

This system also includes a means of activating acoustical or homing torpedoes. When they have traveled a safe enough distance from the submarine, the torpedo is activated so that it will seek out the ship at which it is fired instead of homing on the submarine that fired it.

The Mark 112 consists of two primary units—the Attack Console in the ballistic missile sub's attack center, and the Torpedo Control Unit in the forward torpedo room. This advanced system is also being installed in all other nuclear FBM, attack and ASW subs now being built.

—H. George Baker, JOC, USN.

THIS IS NUMBER THREE—USS *Theodore Roosevelt* SSB(N) 600, is launched.



SP Plus PERT

WHEN IT WAS DECIDED that the Navy would develop a Fleet ballistic missile peculiar to its own needs, its designers in the newly created Office of Special Projects (in BuOrd) faced a number of problems which were also peculiar.

Three major considerations set *Polaris* apart from other outer space weapons:

- The missile had to be designed within the limitations of space and weight which would permit its being carried on board a submarine. This, in itself, required some very radical designs.

- It had to have the capability of carrying a nuclear warhead as its payload and, although it would have a range of some 1500 miles, it would have to be small enough to permit carrying a considerable number of missiles in a single submarine without increasing the size of that vessel appreciably.

- Its propellant had to be solid—as opposed to the liquid fuel systems used at the time to drive other comparable types of missiles. There was—and still is—no practical way to store or handle liquid missile fuels aboard a surface ship or submarine, except in small, completely sealed prepackaged units.

In addition, there were knotty problems concerning precision navigation, stowage, handling, launching and fire control gear.

AND—there was no time for a leisurely trial-and-error program of research and development. Each de-

cision had to be right the first time.

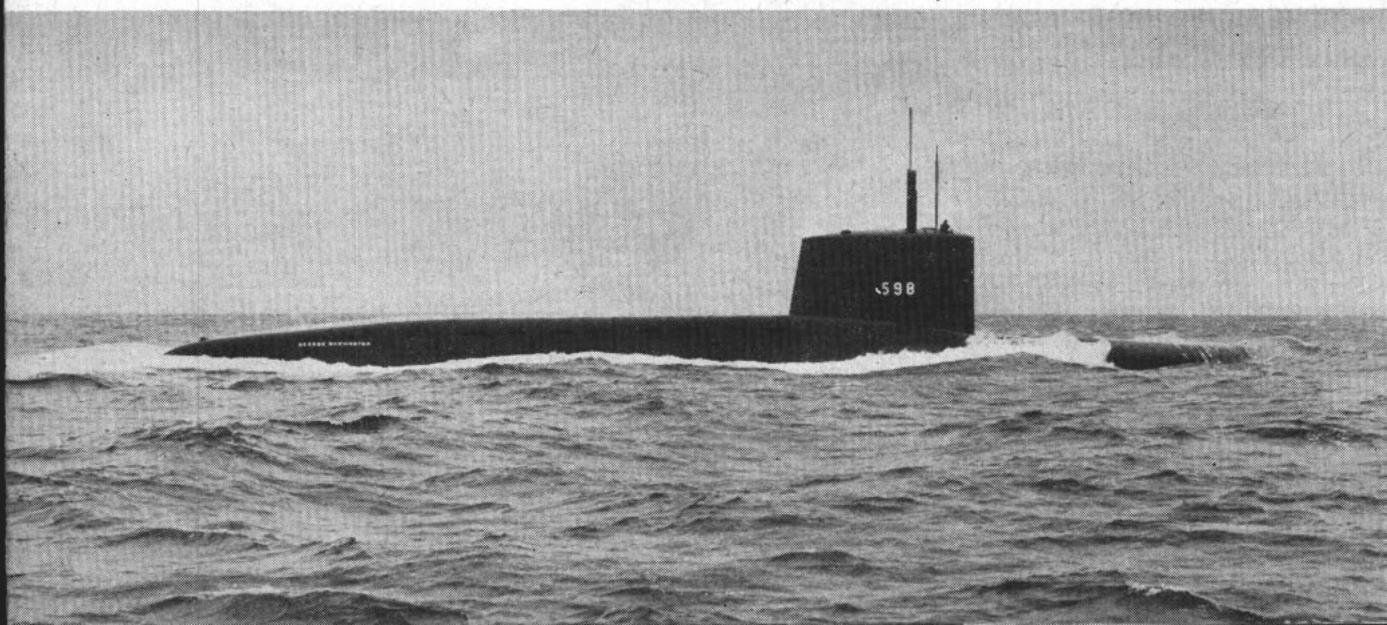
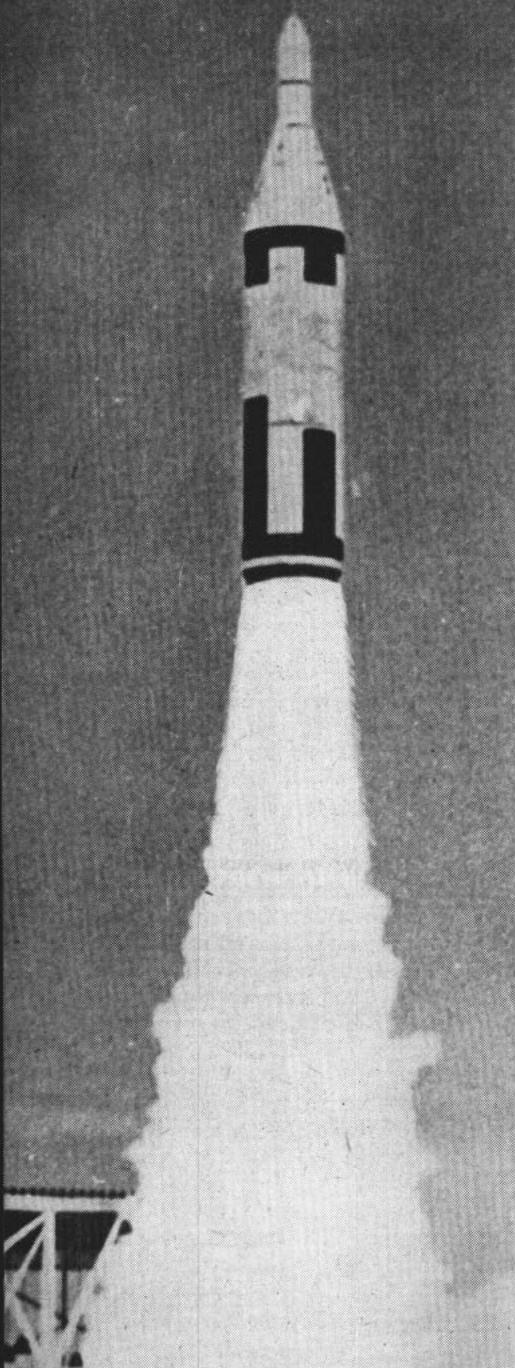
One of the first critical decisions to be made by the Director, Special Projects Office—RADM William F. Raborn, USN—concerned the problem of handling all the multitude of details connected with the program. It would be only too easy to become bogged down with paper work and red tape. Forms and reports, no matter how well written, do not, in themselves, build missiles.

A new approach was made. It was simple. It worked.

IT WAS BASED on the concept of a small, highly specialized "Management Team." It used the facilities within and outside the military services which were already in existence and operating, rather than setting up new facilities of its own. To implement this, the Navy created a Manhattan-Project-type organization which reported directly to the Secretary via the Executive Member of the Navy Ballistic Missile Committee and which had over-riding priority and complete authority once approval of the NAVBMC was obtained. The NAVBMC, chaired by SecNav, provides policy guidance and is the sole reviewing authority for the *Polaris* program in the Navy.

The original group of men assigned to this project in SP was less than 25. Even today, it numbers only about 400, divided into four offices—the central one at Washington, plus three others; one on the West Coast, and two on the East Coast,

SPECIALIZED management team sped *Polaris* on its way to join the Fleet.



Gave Polaris Its Spurt

including a test group at Cape Canaveral.

Although its director reports directly to the Secretary of the Navy in the military sense, and policy guidance, program review and approval stem from the NAVBMC, the Office of Special Projects is administratively linked to the Bureau of Weapons. The latter, however, furnishes only administrative support and services.

As a result, the Special Projects Office—or “SP” as it is called—draws directly on a wide range of government facilities for design, development, test and training.

SP deals directly with industry in other technical matters and in procurement. It is, in effect, a “Management Contractor” within the Navy itself, the first such organization to be established. It is a funnel through which military needs and development skills of all types pass into the industrial facilities that produce and assemble the actual hardware, and back into the military facilities which provide the tests and training.

The project involves some rather staggering numbers. There are about 400 major programs involved, with literally thousands of sub-programs. These fall into seven broad categories: The missile itself, fuel development, guidance and fire control, launching and handling, navigation and communication, supporting activities, tests and training.

THE TIGHT TIMETABLE allows no margin for guesswork or slippage. Each item must be at the right place, in the right degree of completion, at the right time. And every item must be developed and obtained outside of the SPO itself.

The core of the programming and control setup rests on simplification of four fundamentals of planning, coordination, evaluation and communication.

A form was developed in SP to organize the planning job. It provides very simple arrangement of the elements of each specific program, such as what is the job to be done; what it consists of; what it will cost, and when each step involved must be completed. It also lists who must do the job; who must provide help

or support, and who should know what’s going on so that he can do his own job better.

There are a number of “levels” at which these forms are used, each one breaking down a basic project into greater and greater detail, so that every phase of the project is covered by coordinated, organized planning following the same set of ground rules.

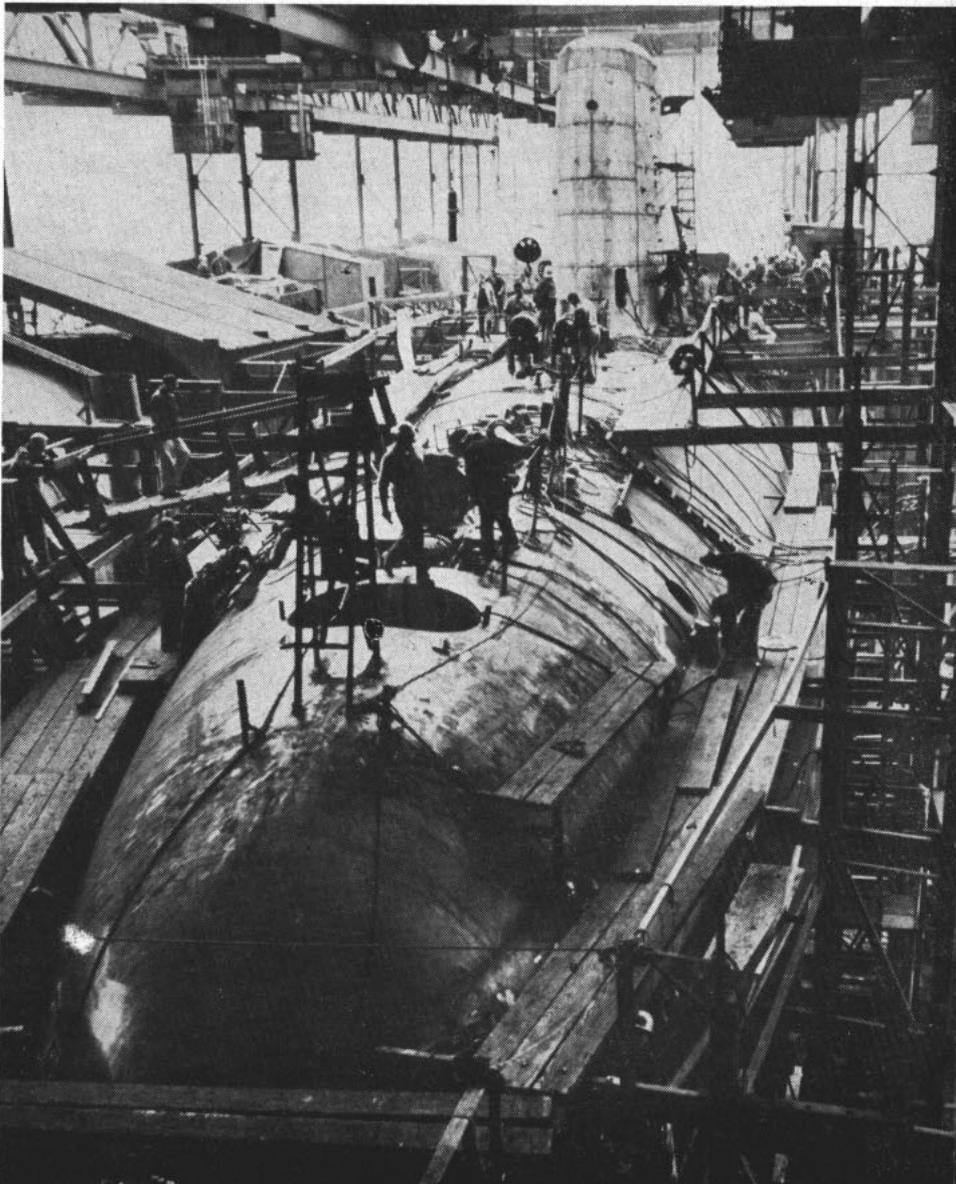
WITH THE SIMPLIFICATION of the programming, there has been an equal simplification of the reporting function. Here, too, some new gimmicks have been used. With some 3900 contractors engaged in developing or making every conceivable

type of component, hundreds of thousands in all, a small “management team” could very easily grow into a large “management team” in simply keeping track of the progress of these items. This has not happened.

To tie the reporting of individual projects as closely as possible to the demands of the program as a whole, a very simple “qualitative” scheme of reporting and charting has been devised, so that a diversity of elements could be evaluated and compared realistically and quickly.

On page 13 a typical chart shows where a project stands as of a specific date. It breaks the status down into four broad qualitative cate-

FAST WORK—SP’s organization has accelerated the many-phased *Polaris* Project toward completion. First FBM submarine was built in record time.





POLARIS SKIPPER—RADM W. F. Raborn, USN, director of the Polaris missile program, discusses USS George Washington with CNO, ADM A. A. Burke.

gories, each identified with a simple, understandable phrase. It takes no study or special indoctrination or "key" to find out what the chart reports, basically, about its program.

The four phrases, however, do have a pretty specific meaning in SP.

"In good shape," says in three words, approximately this: "Everything I proposed to happen last week that I thought would represent progress did happen . . . I am happy the way things are going."

"Minor weakness" might be paraphrased as: "Something happened that I didn't think would happen . . .

But this is a relatively small matter that I can take care of without help."

"Major weakness" says, in effect: "Boss, I need your help." And finally, "Critical" can be translated into: "Boss, you're going to need help."

FROM THE PRACTICAL standpoint, a mere glance around the management center will not only indicate the existence and degree of trouble spots, but also the level at which these demand attention. It is a simple system, but it has worked.

It is, incidentally, a system which has attracted much attention in the field of management. The other

armed services and the business world have been watching the progress of the Polaris program with particular interest in the efficiency of its management. Universities and colleges have described it in detail in their business administration courses and it has been the subject of many articles in business and management publications. Representatives from Sweden, England, Canada, SHAPE, Israel and Venezuela have been interested observers.

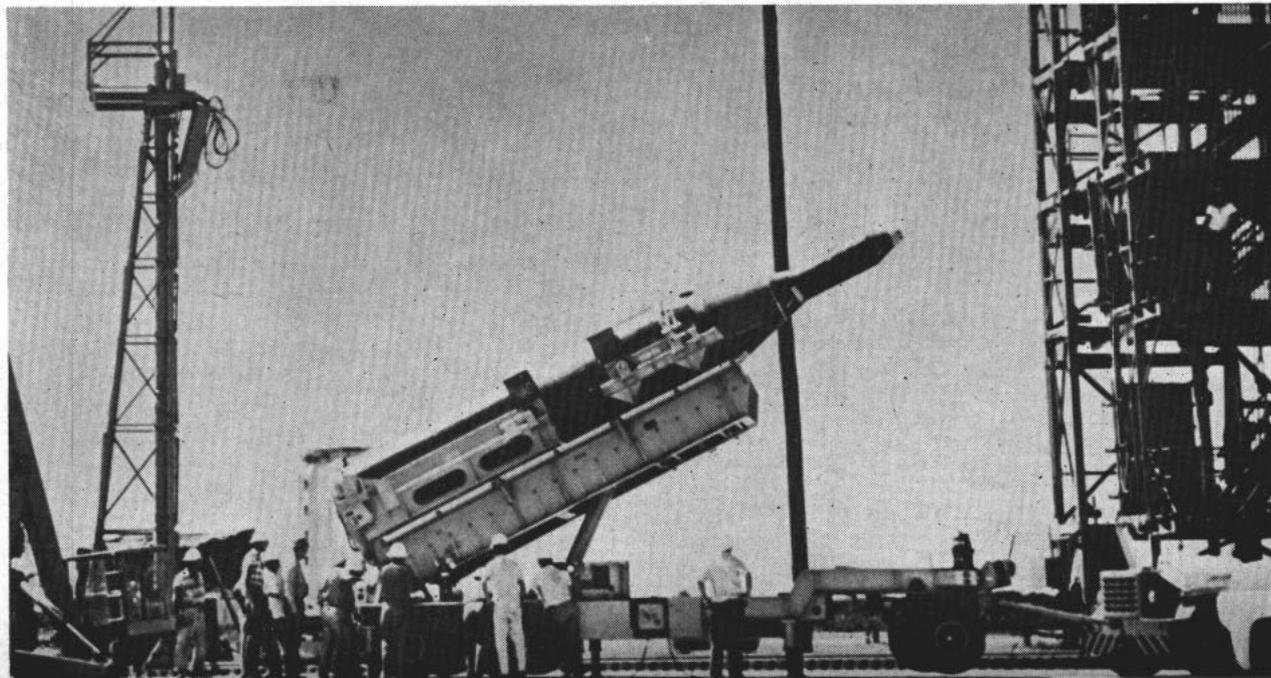
This concept of reporting has been applied also to the reports of the various contractors and contributing agencies. As a result, the status of thousands of components of varying complexity and importance can be evaluated in terms of the ultimate qualitative appraisals into which any figures, or dates, or percentages must be translated before they become meaningful to those who must do something about them. (Action is not taken on figures, but on the *situations* which these figures reveal.)

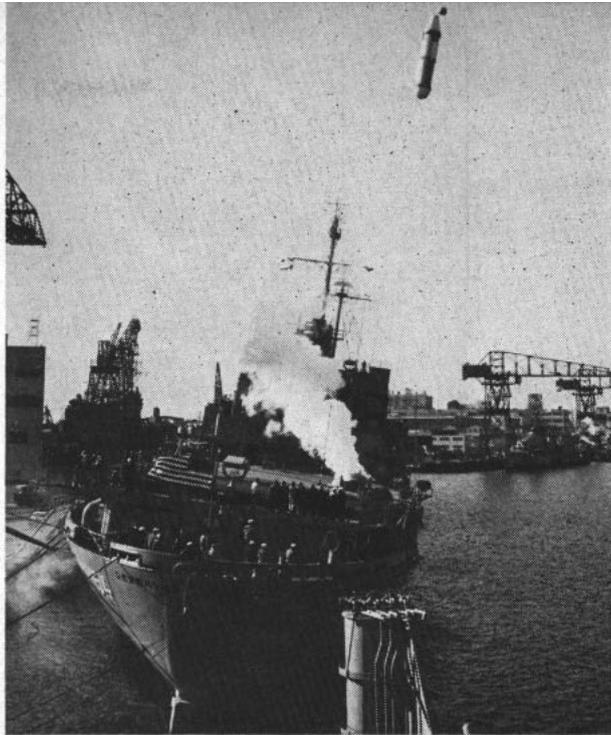
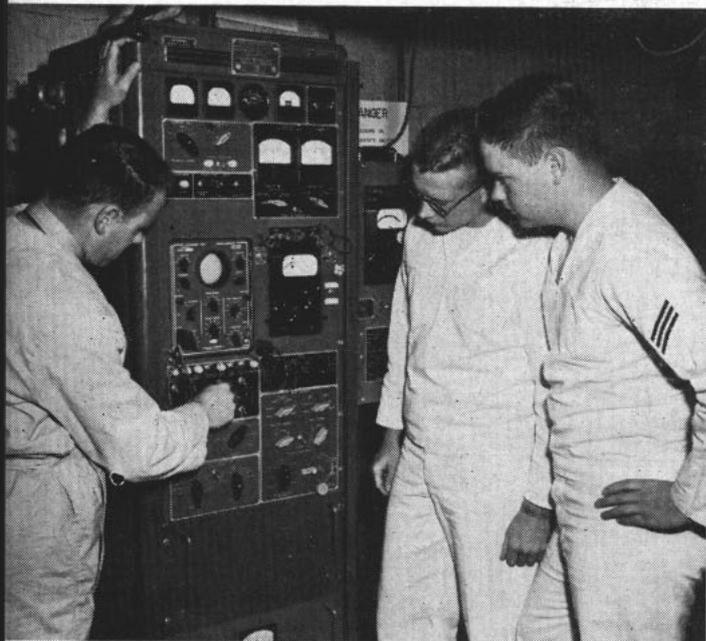
By having the same terms used at every reporting level, and by having these terms have a common meaning, a great deal of misunderstanding and slippage has been averted.

The simplification of programming and reporting has resulted in a similar simplification of communication. As a matter of fact, every Monday morning a staff conference is held at the SP management center in Washington at which the various project officers meet and report.

The average time of each report is about eight minutes, with each interested activity receiving both the programming format and the report-

TESTING STAGE—Polaris test vehicle is raised from flat bed trailer to launching pad at Atlantic Missile Range.





MISSILE AND MEN—Project included thousands of sub-programs from construction of *Polaris* to training of Navymen.

ing chart. These, incidentally, cost about a cent apiece to reproduce, and are worth many times their weight in gold in time saved, confusion averted, and jobs not held up through lack of communication.

SINCE THE *Polaris* program, like every project, requires both money and careful management of the money, similar simplifications have been introduced in determining the funding requirements and in keeping track not only of the money handled, but also of all resources, such as personnel, facilities and supplies.

However, management by SP involves more than planning, reporting, evaluation and communication. *It involves decisions.* In the case of SP, as in any project involving hun-

dreds of thousands of items and many, many dollars, to say nothing of its impact on national security, it involves many hundreds of decisions, military, technical, administrative, operational and fiscal.

One system which has been developed and installed in several complex branches of the program is a computer operation that solves, mathematically, a whole range of problems in programming and prediction. It is called "PERT," the four letters standing for Program Evaluation and Review Technique.

PERT operates on the principle of "simulation," wherein tens of thousands or even hundreds of thousands of individual calculations are made in minutes to measure the impact on delivery schedules of wide numbers of possible variant elements or vari-

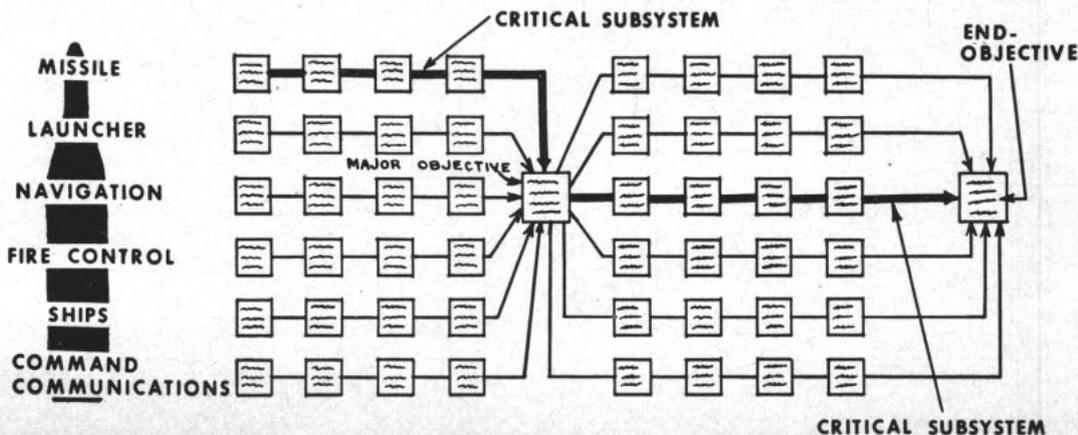
ants. It has already more than proved its worth in actually shortening delivery times, or in showing what was needed to coordinate the flow of components to meet the target. In short, it has told Special Projects just what can—or cannot—be expected under specific conditions, eliminating assumptions, estimates and guesswork. PERT requires *Polaris* contractors to do detailed thinking and analysis of the job requirements in advance.

Described thus, the system sounds simple. It is.

Has it worked? It has. Two years have been cut from the original timetable from the design stage to the first operational weapons system.

All principal scheduled dates have been met. This, in itself, is something of a record in missile development.

PERT OUTLOOK FOR FBM SUBSYSTEMS





SPECIALIZED training is needed to man FBM subs. Below: Navymen study new computer, (above) learn about missiles.



Training

WITH "BULLETS" which cost over \$1,000,000 each, fired from a \$100,000,000 gun, indifferent marksmanship could prove costly.

Those figures indicate the estimated costs of the *Polaris* missile and a Fleet ballistic missile submarine. At the controls of this missile and its mobile launching pad will be a team of well-trained Navy officers and enlisted men.

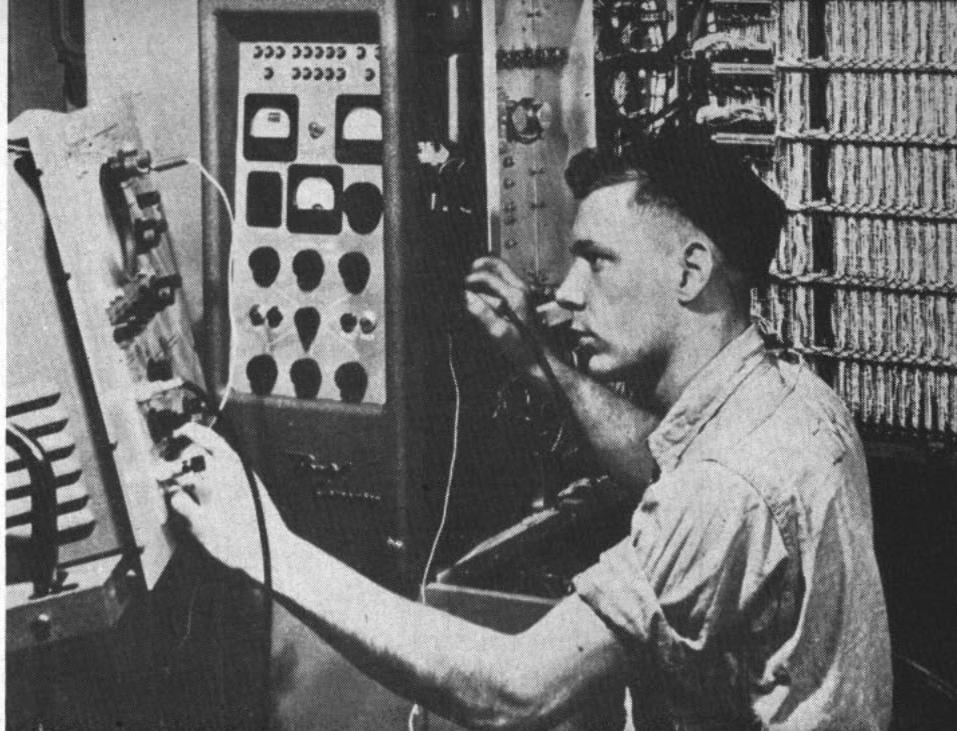
The Navy now has trained two crews each for three nuclear-powered FBM submarines. *George Washington*, SSB(N) 598, *Patrick Henry*, SSB(N) 599, and *Theodore Roosevelt*, SSB(N) 600. The training is new, and the two-crew (blue and gold) concept is new.

The nuclear-powered submarine has the mechanical ability to stay submerged and operating far past the capabilities of her crew. To realize her full potential, she must be manned by two alternating crews. (See page 8.)

More than a third of the crew of the FBM submarine, and nearly all the officers, get nuclear training.

The training these men receive is the same as for any other nuclear-powered submarine. It starts either at the basic nuclear power school in Vallejo, Calif., or New London, Conn. There, the men who were already qualified volunteers from the

ALL HANDS



LEARNING THE FBM WAY—Navy ET checks on *Polaris* sub-type navigation gear on board *USS Compass Island*.

Today's Nuclear Navymen

submarine force learn something about the field of basic nucleonics.

During nearly six months in a basic school, the men—they include HM (E-6 and E-7 only), MM, ET, IC, EM, and EN—learn about nuclear power plant construction, and the design, operation, and electrical counterparts of the system.

From this basic school, the potential nuclear-Navy sailors move to Idaho Falls, Idaho, for a 24-week operational course. There they study and train on a live reactor. This is a land-based prototype of the power plant of *Nautilus*.

From this school the men are assigned a nuclear-powered submarine. Some of them may be assigned to an FBM crew.

But Fleet ballistic missile submarines need more specialists than do regular nuclear-powered submarines. Each carries special navigation equipment, *Polaris* missile launching and guidance control equipment, and many other special features that are necessary for missile-launching.

These men, although not graduates of nuclear-power school, do begin as qualified submariners, and they do receive special training. They may be ET, QM, FT, GS, TM, SO, or RM.

With the exception of SOs and

RMs, men of this group start their training for the FBM program at the Navy's Guided Missile Schools, Dam Neck, Va. Men trained together in these schools generally serve together as a crew of an FBM submarine.

Some courses include more than one rate, but for the most part, single rates train together.

Here, for example, is the background an electronics technician gets.

He first attends a three-week navigation sub-system familiarization course at Dam Neck. A six-week special technology course follows.

It is in the special tech course that he first comes in contact with new terms, techniques and devices associated with the program.

For relaxation, he brushes up on binary arithmetic, Boolean algebra, basic digital computer theory and methods, computer programming and

UNIFORM OF TOMORROW—FBM submariner of SubRon 14 models new uniform designed for enlisted crew members of Navy's *Polaris*-firing submarines.





MISSILE SCHOOL, Dam Neck, Va., training men for Polaris subs of SubRon 14.



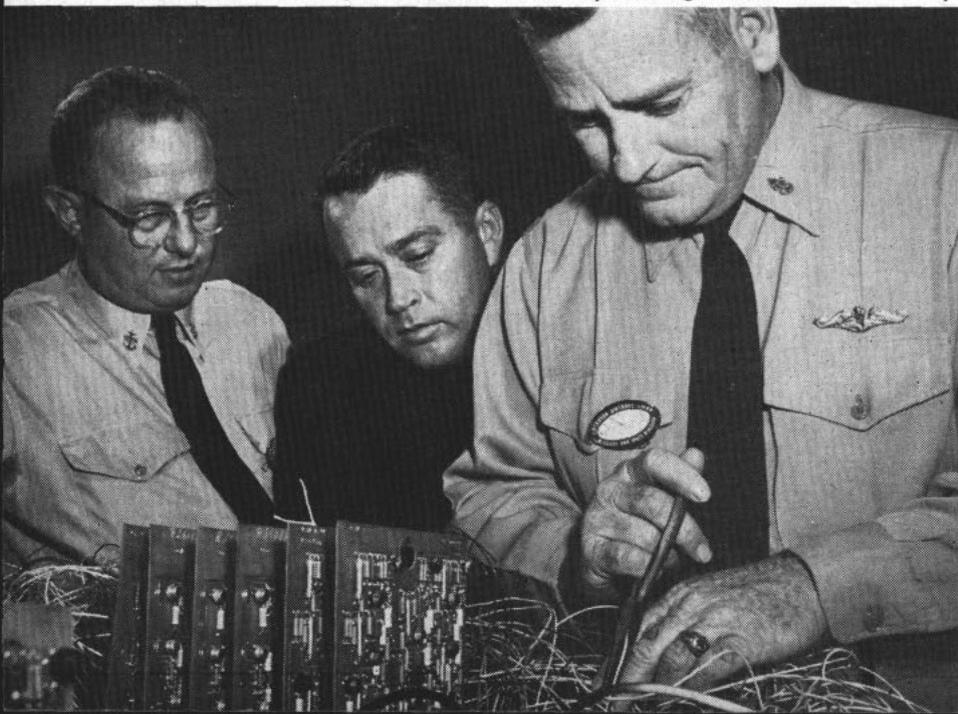
practical experience in maintaining computers, transistors, printed circuits, and inertial techniques and equipment used in the FBM program.

After these two courses, which are a general, over-all indoctrination on the FBM submarine and the Polaris missile system, the ETs move on to more specialized training.

At this point, the group is split up to receive different training. They become experts in one phase of the program. Then, when they are assigned to a crew, they will learn about additional special equipment through on-the-job training.

One group of ETs start a nine-week course learning about the ship's inertial navigation system (SINS.) This training is done at

SOME OF FBM sub gear is so new that Navy training must be done at factory.



either Dam Neck, or the factory where the gear was developed.

Another group of ETs leave Dam Neck and go to a civilian company where they learn to operate and maintain different types of navigation data simulation computers.

A third group spends nine weeks training on various other special navigation equipment either at Dam Neck or at a civilian factory.

From these schools, part of the ETs go for further training aboard USS *Compass Island* (EAG 153), which is equipped with navigation equipment similar to that which will be aboard the FBM submarines.

Quartermasters are first introduced to special navigation equipment at Dam Neck, Va., where they take a two-week course in navigation familiarization. From Dam Neck the QMs also go aboard *Compass Island* for additional training in the operation of special navigation equipment.

Fire control technicians also start at the Guided Missile School. They first take a one-week course in weapons system orientation, and then a six-week special technology course at Dam Neck. The special tech course is the same as that presented to many other ratings.

From Dam Neck, the FTs move on to Pittsfield, Mass., for a course in SSB(N) fire control. They train at the factory because the new equipment is not now available in Navy schools. It also gives the men the benefits of talking and working with the engineers who developed the equipment. Eventually, when the equipment is available, all training will be done by the Navy in Navy schools.

Many FTs go from Massachusetts directly into the FBM program. This can mean several things to students. They may be assigned to USS *Observation Island* (EAG 154) which is designed to test fire the Polaris missile; to Cape Canaveral, Fla., where Polaris is being tested; or to a building yard for further training while awaiting a submarine.

Guided missilemen, although already trained in guided missile theory, are also given special training. Like several other ratings, they begin with the weapons system orientation and the special technology courses at Dam Neck.

Part of the group then moves to Sunnyvale, Calif., where they study the maintenance and operation of

the electrical system and flight control of the *Polaris* missile.

The other group moves in the other direction. They go to Pittsfield, Mass., for nine weeks, where they study the FBM guidance system.

Torpedoman's mates also have an active part in the *Polaris* missile program. For years TMs have worked with torpedoes (nothing more than a guided missile itself), but now their missile will be shot upward through the water and into the air, rather than only through water to its target.

These men spend one week in the weapons system orientation course at Dam Neck, and then move on to another course at the same school on ordnance preparation. This course includes instruction in basic electricity and basic rocketry.

From Dam Neck the TMs travel to California for a seven-week course in missile ordnance and launching. They are taught how to handle *Polaris* between ship and pier, or between ships. They also study the missile-launching system.

Last of this special group of men who undergo training is the radiomen and a small group of electronics technicians.

These men are trained to operate and maintain new-type communications equipment which has been developed specially for the FBM program. A combination of short courses on this equipment take the men about 12 weeks.

Some other crew members, who may not have gone through any of this special training, attend advanced training in their own rates before they join a crew.

Although the men who have taken this special training are undertaking new responsibilities, they will, of course, keep their same rates. As a result of this training, they will be assigned special NEC numbers which have been set up for these men. The new enlisted classification numbers are:

- TM - 0762—Fleet Ballistic Missile Ordnanceman.
- FT - 1195—Fleet Ballistic Missile Fire Control Technician.
- GS - 1321—Fleet Ballistic Missile Guided Missileman.
- GS - 1322—Fleet Ballistic Missile Guidance Technician.
- ET - 1551—Inertial Navigation Technician - Analog.
- ET - 1552—Inertial Navigation Technician - Digital.



ISLAND SCHOOLS—USS *Compass Island* is training men on new navigation gear. Below: USS *Observation Island* (AG 154) test fires a *Polaris* dummy.

- ET - 1553—Inertial Navigation Technician - computers and auxiliary equipment.

- ET - 1558—Fleet Ballistic Missile Instrumentation Technician.

- PH - 8141 — Instrumentation Photographer.

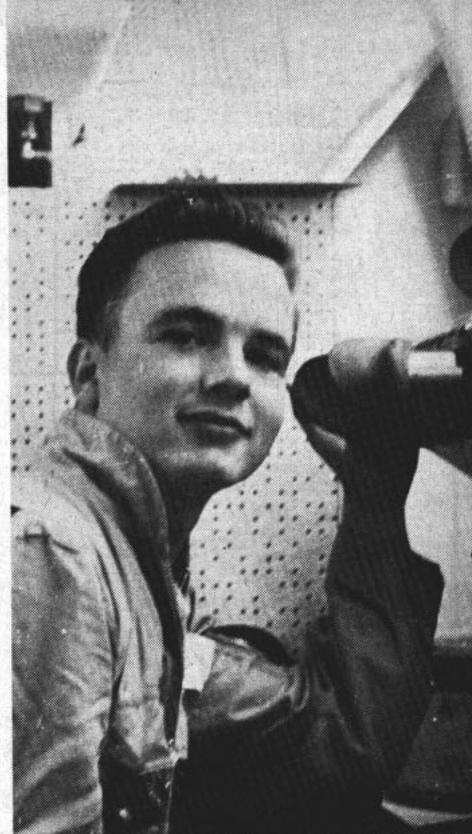
Training does not stop when a man is assigned to an FBM submarine crew. The men will continue their studies at the shipyard where their submarine is being completed.

Later this year a *Polaris* team trainer should be completed at New London, Conn., that will enable the entire crew to continue operational training in both ship qualification and the weapons system.

This device will keep one crew busy while the other is at sea. As in the rest of the Navy, the training of FBM men never stops.

—Erwin Sharp, JO1, USN.





'SPACEFLYER' takes turn at controls.

GETTING

VISUALIZE, IF YOU WILL, a cylinder some nine feet long and about five feet in diameter. It resembles very closely a recompression chamber. It isn't quite. A bulkhead divides the interior into more or less equal parts. One portion holds two midget-sized bunks no more than four feet long, 30 inches wide.

There are two stools inside, painted hospital white, as is most of the interior. In the forward compartment are control panels, gauges, dials, wheels, radar-scopes and other gear. Mounted near the overhead in each compartment is a television camera, so placed that it scans the entire area. Indirect lights are always on. There are no portholes. Entrance is gained through a 36-inch hatch.

In this chamber six Navymen lived, slept, ate and worked for eight days. The space works out to some 60 cubic feet per individual—about the same area as the inside of a telephone booth.

Not for you, you figure.

But somewhere in the Navy today are men who, before their 20 years have expired, may be traveling

through outer space in some type of vehicle. Or they may be crew members of a platform suspended somewhere in the sky.

The six men mentioned above were guinea pigs—and volunteers—for one of the many steps necessary before actual space travel can become reality. So far as we know, this is the closest we have yet come to conditions as they will be found in our first space ship—minus, of course, the actual travel.

THE SIX SAILORS spent more than a week cooped up in those two small rooms, completely isolated from the outside world, in a test conducted by the Air Crew Equipment Laboratory, a unit of the Naval Air Material Center, Philadelphia. The experiment had a two-fold purpose—to evaluate psychologically and physiologically the reaction of men to various stresses under a prolonged period of isolation, and to test a radically new and different method of oxygen supply.

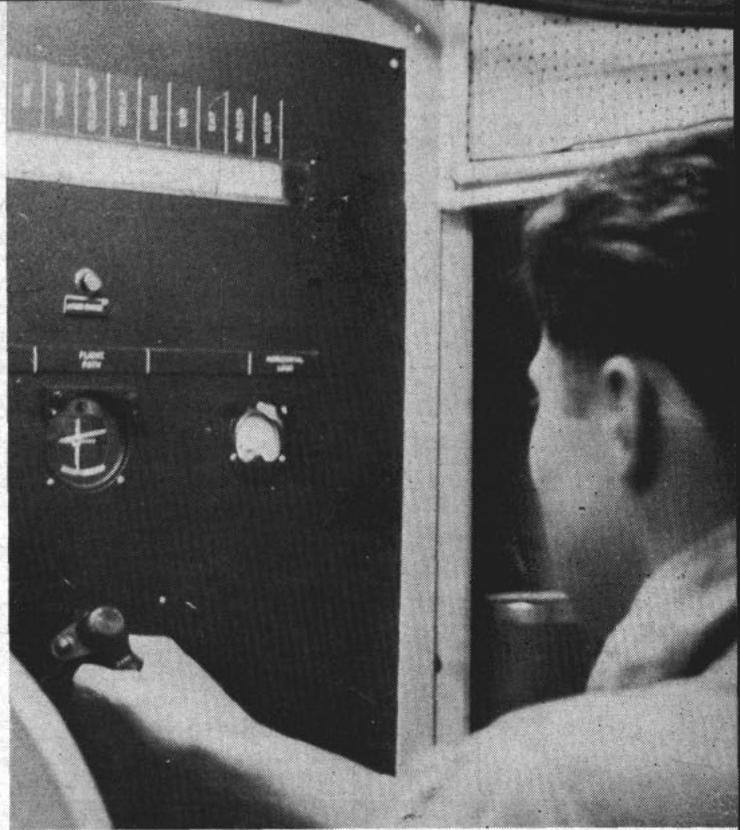
No test, of course, can completely simulate actual conditions. This was no exception. Three elements miss-

ing from this experiment which would exist in a real space flight were the acceleration and deceleration involved in take-off and landing, and the weightlessness which exists in outer space travel. Psychologically, too, there was another factor, impossible to overcome. The men knew that this was just a test. Therefore they couldn't be expected to meet its problems with the same starkly serious attitude that they would a real space flight.

ACEL's scientists made the test as realistic as possible, however, and evaluated their findings with the test conditions in mind.

TWO MONTHS BEFORE the test was scheduled to begin, the lab published a notice among all NAMC personnel, briefly explaining the projected experiment, and asking for volunteers.

An original group of more than 40 men who responded were given a battery of tests, designed to investigate their personality factors, anxiety level and problem-solving ability. At the conclusion of these tests the men were told more about what the experiment would involve,



HERE'S HOW Navy volunteers took a space cruise at Air Crew Equipment Laboratory located at NAMC Philadelphia.

A TASTE OF OUTER SPACE

and 24 of the group still elected to volunteer. More tests followed, and six were finally selected.

They were: *Nicholas H. Noche*, AB1, 29, Newark, N. J.; *Robert F. Mullett*, AB2, 22, Pittsfield, Mass.; *William F. Lamb*, AK3, 22, Dorchester, Mass.; *Charles T. Cooper*, AK3, 21, Clayton, Ind.; *Richard Fleschner*, SN, 19, Queens, N. Y.; *Robert A. Breithaupt*, AA, 18, Philadelphia, Pa.

These men were selected because they possessed emotional stability to a high degree. The tests they had undergone closely resembled the type used to select submarine and aviation personnel.

It has been said that spaceship duty will be a good deal like submarine duty—close confinement and long periods of time cut off from the natural elements. The men best suited for this kind of duty are solid, unemotional types, what the Navy experts would call “squared away sailors.”

A few days before the test got underway the six selectees were put on a four-on, four-off schedule, to accustom them to the routine before they entered the test chamber.

AS MENTIONED EARLIER, there was almost complete isolation inside the chamber. There were no watches, clocks or radio. Meals were passed in through a special airlock. There were assigned tasks for each man to perform—they rotated from job to job, to a sleep period, to a rest break or a meal hour according to a code schedule flashed to them from the outside.

For this purpose the men were numbered one through six. When a new schedule was announced, numbers one and two, for example, would shift to the two bunks for a four-hour sleep period. Numbers three and four would take over the watch on the radarscopes. Number five would move into the pilot's seat, steering a pre-determined course. Number six would put in a stint on the radio headset.

Evaluation of the physical and mental responses of the test subjects was the responsibility of ACEL's psychology department. Many people lent a helping hand in one form or another, but the major portion of the work involved in preparation, observation and evaluation fell on ACEL's Deputy Director, Cdr. R. L.

Burdick, usn; LTJGs Bert Lowi and Tom Gallagher, both Medical Service Corps psychologists; and Dr. Neal Burns and Mr. Ralph Ziegler, civilian psychologists. At least one of the laboratory's medical officers was always present outside the chamber during the entire test.

In addition to two television monitors reflecting the scenes captured by the cameras inside, the testers had a couple of other gimmicks to help them keep track of their subjects. One of these was a hidden microphone, which was planted in the chamber without the guinea pigs' knowledge. Thus uninhibited by any idea of being overheard, the men felt free to unburden themselves.

Every spoken word was picked up outside via a set of earphones, logged, and simultaneously tape-recorded. Understandably those tapes are rich in humorous, spicy and—to a psychologist—revealing comments.

ANOTHER CONTINUING CHECK was achieved through measurement of skin responses. According to the medical experts, the skin is a very



GOAL—Navy experiment furnished valuable info for future space flights.

accurate barometer of a man's physical and mental state. As the subjects went about their varied tasks, they carried attached to their arms and legs a type of electrode, or small clamp. Wires led from these electrodes to a computer outside. In

much the same manner in which an electro-cardiograph mirrors heart action, this machine registered the men's reactions as reflected by their skin condition throughout the eight days.

In their pre-test briefing the men

Air Crew Equipment Lab Has Been Busy A Long Time

The Air Crew Equipment Laboratory got its start in 1942 as the Aeronautical Materials Laboratory, with but one Naval Flight Surgeon attached. His assignment was in connection with an altitude chamber and cold room then being developed.

As the years rolled by, projects were assigned which necessitated more facilities and more personnel. In a gradual evolution, the activity moved through two more stages—first as the Aeronautical Medical Department, then as the Aeronautical Medical Equipment Laboratory—until 1956, when it was given its present designation.

ACEL's energies are concentrated in four main areas—*escape and crash safety, medical sciences, safety and survival equipment and special project sciences*. They are particularly active in the fields of human engineering, crash protection, high altitude and temperature physiology, emergency escape devices, oxygen equipment, flight clothing and pilot's personal gear, such as anti-exposure suits, full pressure suits and helmets.

The lab's guiding principle is that the problems inherent in such an ambitious program can only be successfully attacked and solved by combining the varied skills and

training of flight surgeons, physiologists, psychologists, engineers, aviation survival equipment technologists and physicists.

These technicians work with the most advanced tools yet devised. Included are: a seat ejection tower; a high acceleration catapult; specialized altitude-temperature chambers, one of which has been fitted out for confinement and habitability studies concerned with space and orbital flight; a combination explosive decompression and environmental chamber; an all-weather room; a cold room; a sound room; an electrostatic shielded room and a vertical drop tower.

This combination of technicians and equipment has made possible many significant contributions to U. S. space exploration. Among them: development of the full pressure suit and associated equipment permitting sustained flights above 45,000 feet without cabin pressurization; an improved oxygen breathing mask; physiological and psychological studies aimed at determining human tolerance to various stresses; a trajectory analysis for high performance naval aircraft; a sea-level escape system; development of protective helmets, summer and winter flight clothing, and anti-exposure suits.

were told that their work, rest, eat and sleep periods would follow a rigid four- and eight-hour schedule.

One of the more important points about which the psychologists wanted more information, however, was the ability to keep track of time under these circumstances.

They adhered to the schedule strictly the first two days, then began shifting times slightly, and fouling up the meal rotation.

Some of the men, it was found, were better able to keep track of time than others. A couple of them were usually within half an hour, or even closer, in their estimates. Even when the schedule was altered to shift job and sleep periods after two and a half, three or five hours instead of four, or when two lunches were served in a row, or when breakfast was sent in the evening, they weren't fooled a whole lot—during the entire test no one was more than two hours off in his guesses as to the time.

THERE WAS FAR LESS irritability and friction among the men than might be imagined. Although the subjects were only casual acquaintances before the test began, they became surprisingly close as a group under common stress. In much the same manner that the crew of a ship, plane or submarine reacts in battle, whatever hostility they generated was directed not at each other, but at a common "enemy"—the watchers outside.

There was a minimum of griping and hostility through the first six days—certainly no more than the normal, expected amount—and it was the seventh and eighth days that yielded the doctors most of the information they were seeking. There was a good reason for this—the men had thought they were getting out after six days.

While not telling a deliberate lie, the doctors had very carefully planted that impression in the men's minds before the test began. As we mentioned earlier, the guinea pigs were thoroughly aware of the approximate time, and it was obvious from their overheard conversation that they all were looking forward to being "sprung" the sixth day.

What the doctors wished to know, though, was how the subjects would react to the unknown.

A similar test staged some 18 months ago had demonstrated that men could remain reasonably cheer-

ful and competent during isolation so long as they were kept busy at simulated tasks to combat boredom, and provided they had a goal in mind—in other words, when they knew they would get out at a definite time.

IN THE CURRENT EXPERIMENT the evaluation team wanted to find out what might happen if a future space flight ran into some kind of difficulty, and the crew was faced with the possibility of being trapped in space indefinitely. Thus, notes passed out through the food slot claiming that the sixth day had arrived were completely ignored. The men had no way of knowing, for hours on end, whether anyone was still outside or not, and when they would be let out, if ever.

There was no panic. But there was reaction, and plenty of it.

Morale dropped noticeably in those last two days, and, with lack of motivation several of the men either stopped performing their tasks almost entirely, or else went about them in a perfunctory, disinterested

fashion. Since the men weren't aware that they could be heard, they began discussing various plans which would force their tormentors to free them.

There was never any big danger of the situation getting out of hand, however, or of any danger to the subjects themselves—if any of them had shown signs of cracking under the strain, the chamber could have been unsealed at a moment's notice.

Probably two main deterrents kept even the most immature and excitable of the men in line. For one thing, they were told a little white lie before the test started—that, once the door to the chamber was sealed and the test was begun, it would take anywhere from 20 minutes to half an hour to open it again. Apparently they believed this to be true, and felt that if they could take it for another half hour, they could take it as long as was necessary.

Secondly, as is the case whenever a group of men are under stress, a natural leader evolved for the others to rally around. In this instance it was Nick Noche. ACEL's

doctors aren't sure how much the fact that Noche was a PO1 had to do with it, but they feel it was mostly because he was by far the oldest of the group, had had more time in the Navy, and kept a cool head. Whatever the reasons, the other men depended on him in time of crisis, and the doctors think it was his leadership through example which kept things more or less on an even keel.

THIS WAS ESPECIALLY true when a completely unexpected problem popped up on the seventh day. A wire in an electronic panel board installed inside the chamber shorted out and started to smoke. At this stage of the game they were a tired, disgusted, discouraged band, and this was one blow too many.

The consequences might have been serious, but it was here that Navy training paid off. Noche's voice was heard cutting through the babble, barking orders to man battle stations and prepare to fight fire. In the few seconds it took the outside observers to cut off the

SPACE CREW — These six Navymen volunteered to take simulated space flight to test the confining quarters of a mock ship. Rear, left to right: R. A. Breithaupt, AA, USN; R. F. Mullett, AB2, USN; N. H. Noche, AB1, USN; and C. T. Cooper, AK3 USN. Front: R. Fleschner, SN, USN; and W. F. Lamb, AK3, USN.





SIMPLE DAILY ROUTINES, such as eating and sleeping, presented difficulties in the tank's confined quarters.

power to that panel, he had the situation under complete control.

Noche doesn't feel he did anything special. "I was just as anxious to get out of that place as any of the others. But I didn't see what good griping and moaning would do. Besides, we volunteered, and I just figured we had a job to do, that's all."

There's a sidelight here, too. Noche's wife was at the family home in Newark, with the birth of their third child imminent.

Although he was worried about her, and sent out a number of notes

asking for an up-to-date check of the situation, he hung in there and stuck to his job. (It was a boy.)

Noche admits that it was rough and that he would think twice about volunteering again, as would the others. None expressed any burning desire to make a real space flight.

Mullett says he'd go if he could be first. The others would rather hedge their bets a little—"Let someone else go, and if he gets back okay, then we'll see."

LACK OF SLEEP bothered all of them. Most had trouble adjusting to

sleeping only four hours at a stretch, and the stuffiness, light and noise in the cramped quarters made getting to sleep difficult. The two tiny bunks resembled linen shelves more than beds. Most of the men claimed they grabbed more sleep sprawled on the deck than they were able to get in the bunks.

They rated the chow "fair." Supper was good, they said, but there was a lack of variation in breakfast and lunch—the same cereal every morning, and sandwiches for lunch.

This was just another of the subtle stresses imposed upon them.

Four Thousand Navymen, Scientists & Technicians of NAMC

The Air Crew Equipment Laboratory, featured on page 20 in this issue, is just one of five major research and development components of the Naval Air Materiel Center.

NAMC dates its pioneer role in naval aviation from its establishment in 1917 as the Naval Aircraft Factory. It was originally founded by the then SecNav, Josephus Daniels, to supplement the production of aircraft by private industry during World War I.

In 1917 NAF encompassed but 160,000 square feet, and the first buildings were built at a cost of about a million dollars. Today the Center, which acquired its present designation in 1943, includes 114 buildings, 60-odd other structures and an auxiliary landing field. It occupies more than 500 acres at the eastern end of the Philadelphia Naval Base, and has increased its value some 65 times.

Through more than 40 years of operation NAMC's energies have been aimed toward one primary mission—the advancement of the combat potential of naval aviation

in the Fleet through research, development, modification, evaluation and testing.

The four components which, with ACEL, form the research and development heart of NAMC are: *Naval Air Engineering Facility (Ship Installation)*; *Aeronautical Materials Laboratory*; *Aeronautical Structures Laboratory*; and the *Aeronautical Engine Laboratory*.

NAMC is manned by nearly 4000 naval personnel, scientists, engineers and technicians. They are supported by a force of skilled shopmen representing all the arts and trades of modern military aviation. In addition some 13 different departments and offices supply administrative support and services to the Center and its leading tenant the Naval Air Technical Training Unit, which is under the command of NATTU Memphis, Tenn.

The Aeronautical Materials Laboratory carries on chemical and metallurgical engineering research covering such subjects as plastics, rubber, textiles, camouflage coating, special aircraft lubricants, aluminum, magnesium, electroplating

and hydraulic control systems.

Experiments at AML in recent years have produced, among other items, a camouflage paint which defies infrared detection; an abrasion-resistant transparent plastic for cockpit canopies; a new type of lacquer which prevents surface cracking in an aircraft during high speed flight.

At the Aeronautical Structures Laboratory the emphasis is on design and development of structures for existing and future naval aircraft, including missiles and other space vehicles.

Here, aircraft structures are subjected to heat, cold, vibration, weight, compression, acceleration, deceleration and other stresses in a continuous search for stronger and better metals and alloys.

A high temperature research facility is now being installed, which will be used to study the effect on aircraft structures of the extremely high temperatures involved in supersonic flight.

Mechanical, electrical, aeronautical and chemical engineers who staff the Aeronautical Engine Lab-



TIGHT SQUEEZE — Eight days seemed like a long time to the Navy spacemen but they stood the test well.

Their pet hate, though, seems to have been reserved for a type of cherry tart they got each and every day for lunch. For some undetermined reason (the doctors don't know, and the men themselves aren't sure now) this inoffensive bit of pastry became a symbol of their confinement, and they aimed a good share of their resentment at it.

One thing's for sure. If the cherry tart manufacturers had to depend on this group for a market, they'd go broke in a hurry. Each man claims he'll never look at another one.

Another strain, and a big one,

was the ban against smoking in the chamber. All of the men smoke—some are two-packs-a-day men—and all agreed it was rough to go without, especially the first few days.

SO MUCH FOR the physical and psychological aspects of the experiment for awhile—what about the other and equally important objective, the test of the new oxygen-breathing apparatus?

To get the lowdown on this we talked to ACEL's Director, Captain R. A. Bosee, USN.

"One big obstacle, probably more

than any other, has stymied our space probers for a long time," CAPT Bosee told us.

"That was the problem of providing sufficient oxygen for sustained space and orbital flight."

The Captain explained that present oxygen systems have two main drawbacks; because the oxygen is liquid it must be contained in large bottles or tanks which are both heavy and bulky; and liquid oxygen evaporates rapidly.

These characteristics imposed rigid limitations on the amount of time a man could spend in space for a very simple reason: If a capsule were built large enough to hold all the oxygen required for a sustained flight, that vehicle would be so big it would be impossible to boost it into orbit.

What was needed, of course, was oxygen in some condensed form, and that's exactly what ACEL has come up with. The technical explanation would probably take several pages, but boiled down, it works something like this: A chemical which easily releases oxygen has been compressed into tiny, solid granules or pellets. These are placed in canisters. Let's let CAPT Bosee explain what happens then.

WHEN WE EXHALE, our breath contains some unused oxygen, carbon dioxide and moisture. In a closed space, the build-up of carbon dioxide could be dangerous. As the air in the chamber is pumped through this new apparatus, it removes the carbon dioxide and excess moisture and releases new oxygen. In this manner, with considerably less weighty equipment than previously used, man could survive for extended periods, independent of the earth's atmosphere."

A beautiful theory, this. Moisture and carbon dioxide released through normal breathing in turn release the

Work on Flight and Space Problems

oratory confine the major part of their research work to the fields of aircraft power plants, associated accessories, systems, and fuels.

Both turbojet and propeller engines are tested for performance characteristics and durability in 79 different areas, including altitude chambers, cold rooms, dynamometer (power measurement) rooms, endurance cells, and compressor and combustor rigs.

These tests at AEL have led to discovery of new fuels, combustors and starting systems with higher capabilities using less weight and storage space. They've also contributed to carrier flight deck safety through development of a combustion chamber for turbojet engines which eliminates afterfires.

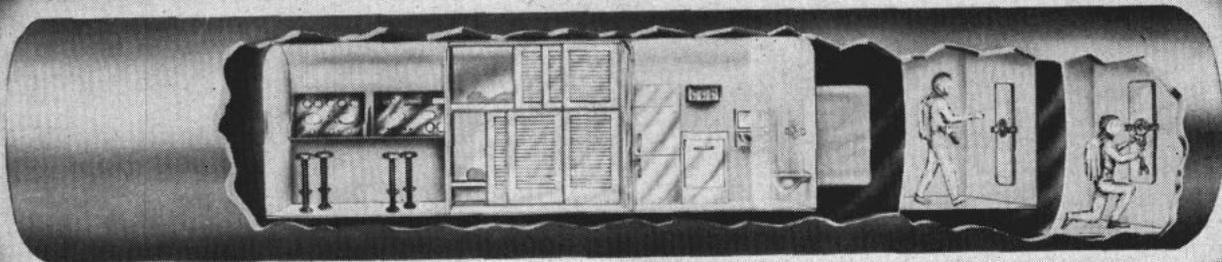
Naval Air Engineering Facility (SI) installed and tested the steam catapults aboard the first U. S. aircraft carriers to use them, *uss Hancock* and *Intrepid*. Scientists working here have developed all arresting gear used by the Navy since 1917; developed the experimental powder catapult; designed, developed and tested all hydraulic cata-

pults used on our aircraft carriers throughout World War II and the Korean conflict; conducted research on automation of shipboard missile handling systems and designed and developed the *Polaris*-launching system power plants.

NAEF engineers must continually develop newer and more powerful catapults and arresting gear to accommodate the faster, heavier planes now being built and planned for the future. In addition, they're responsible for the design and testing of missile launching and recovery systems. Tests are conducted both in NAEF labs and at next-door Mustin Field.

NAMC's scientific activity ties in neatly with experiments conducted in other and related areas at the Naval Air Development and Material Center, Johnsville, Pa., some 20 miles to the north. The Aeronautical Instruments Laboratory and the Aeronautical Radio and Radar Laboratory are among facilities located there.

Both NAMC and NADC operate under the organizational control of the Bureau of Weapons.



OUT OF THIS WORLD—Drawing shows cut away of simulated ship used to study Navyman's space flight problems.

oxygen into the air (from the pellets). Unwanted carbon dioxide and excess moisture are absorbed by the same pellets, without loss of oxygen from evaporation. Literally the same air, constantly replenished and refreshed, is breathed over and over again in continuous cycle. And, best of all, only three ounces of the pellets are required per man per hour.

Does it work? It most certainly does. Sensationally.

All of the oxygen breathed by the six guinea pigs during their stay in the chamber was supplied by this new system, the pellets being replenished from outside as needed.

Contrast that figure to an estimated more than 250 pounds of liquid oxygen which would have been needed for the same period of time.

Compensate for the expected high rate of loss through evaporation. Add the extra weight of carrying the liquid containers—and you get an idea why ACEL's scientists are so jubilant.

They're far from satisfied, however—and won't be until they've reduced the required oxygen supply poundage and storage space a lot further. In terms of contemplated flights to the moon and beyond, any gear solely devoted to oxygen is still too much. There'll be more and continuing studies, aimed at further miniaturizing the apparatus.

PSYCHOLOGISTS Lowi, Gallagher, Burns and Ziegler are still deep in paper work, and probably won't have all their findings reduced to

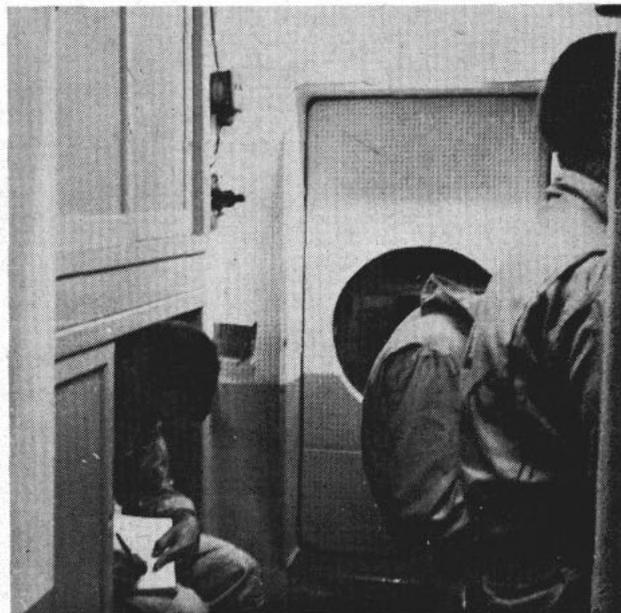
charts, graphs and percentages for some time yet. They feel, however, that a lot of valuable information was gained through this test.

They think that, considering the youth of most of the subjects, they came through in fine style.

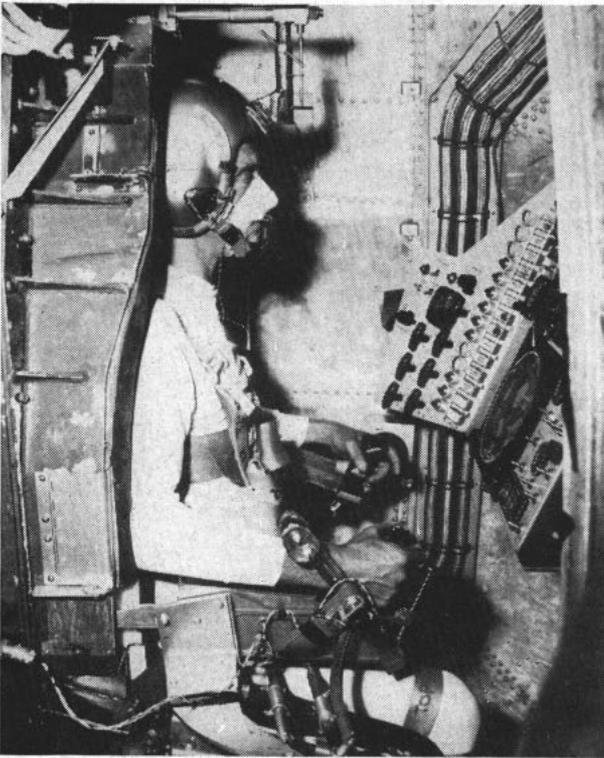
"This was a tough grind," Dr. Lowi says. "They went in boys, and came out men. We're very proud of all of them."

For the youngest of the guinea pigs, getting out of the chamber proved to be an extra-special occasion. The test's eighth day was also Bob Breithaupt's 19th birthday. His mother and brother were waiting outside the hatch when he emerged, welcoming him back from simulated space.

—Jerry McConnell, JO1, USN.



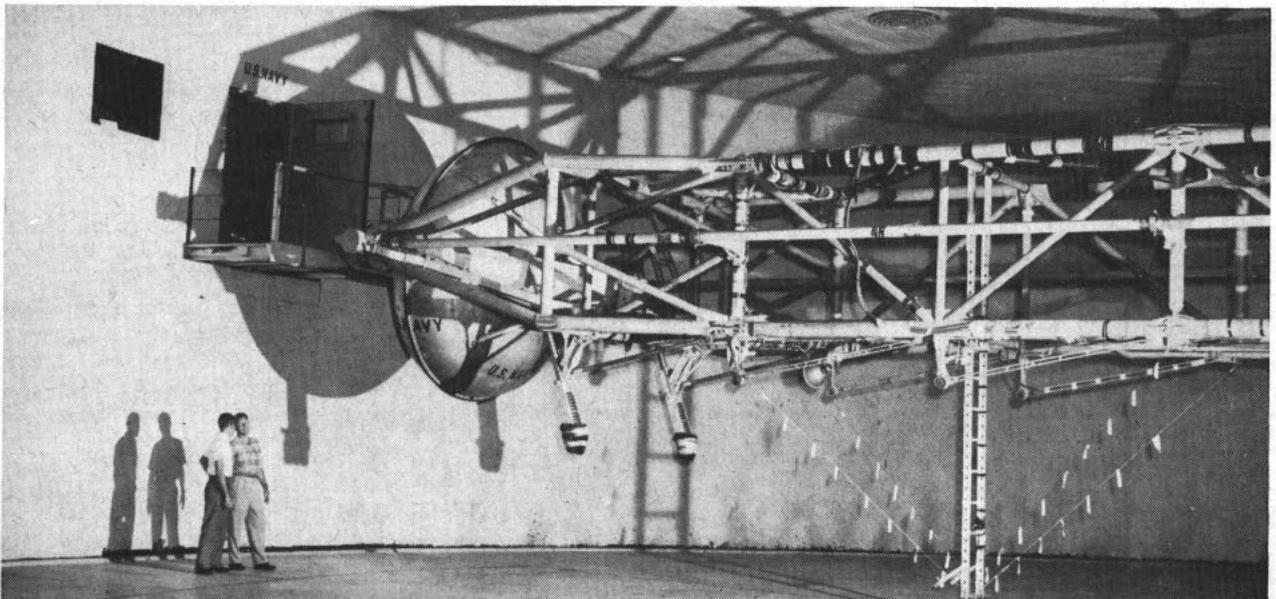
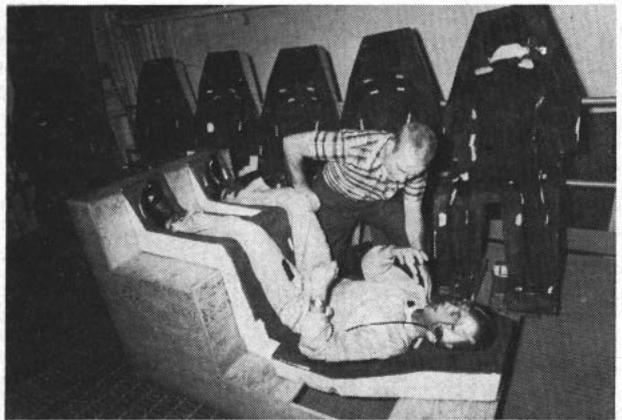
SPACEMEN rotated from job to job and four-hour rest periods as their assigned numbers were flashed on board.

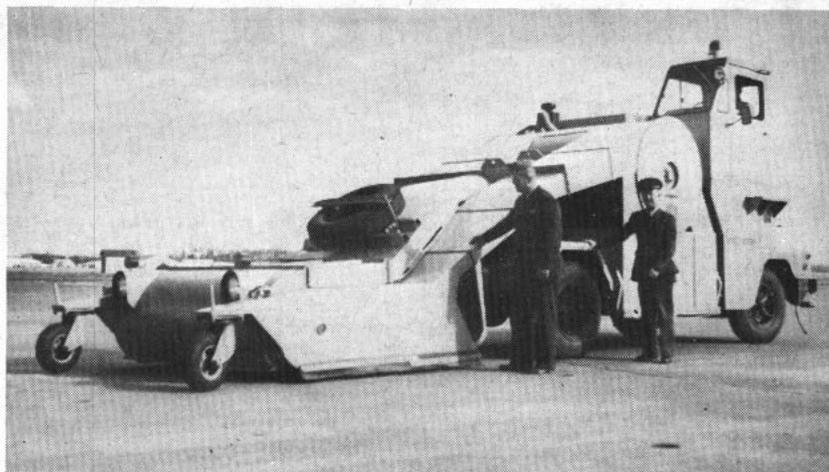


Astronauts at ACEL

ACEL is on the up and up so far as the Project Mercury Astronauts are concerned. In preparation for their flight into space these men have been undergoing training under simulated space flight conditions, and testing gear they will use at Navy's Aircrew Equipment Laboratory, Johnsville, Penna.

Recent tests have included an extensive workout of a full pressure suit designed by ACEL as well as space-simulated capsule flights. Shown here are experiments and tests conducted with the lab's human centrifuge and molded acceleration couch. *Top:* Navy Astronaut, A. B. Shepard, Jr., LCDR, USN, mans controls in centrifuge's gondola. *Top Right:* Centrifuge rider LCDR W. M. Schirra, USN, is readied. *Right:* Molded seat is checked for fit by LCDR Shepard. *Below:* Centrifuge gets set for whirl through simulated "space."





NEW BROOM—This unusual vehicle is a runway sweeper acquired by NAS Atsugi, to cut down on possibility of objects' being sucked into jets.

Dewey, Guided Missile Frigate

uss Dewey (DLG 14), first of a new class of guided missile frigates, officially joined the Fleet in December when she was commissioned at the Boston Naval Shipyard.

The 512-foot, 5600-ton prototype of the largest destroyer class ever built is 50 feet longer and almost double the tonnage of the largest World War II destroyers. *Dewey's* armament and equipment include the ASROC antisubmarine rocket and *Terrier* surface-to-air guided missiles, designed to repel air attack. Conventional armament includes 5-inch/45 caliber and 3-inch/50 caliber guns and tubes for antisubmarine torpedoes.

Implementing this armament are the latest in search radar and long-range sonar devices. Once the target is detected, this gear can keep it under surveillance, record its height or depth, and its course and speed.

The new ship will be manned by

a complement of approximately 20 officers and 300 enlisted men, many of them electronics specialists.

The ship is the second to carry the name of Admiral George Dewey.

Air Weapons Meet Winners

Air Units of the Atlantic and Pacific Fleets divided honors in the Fourth Annual Naval Air Weapons Meet.

VAH-4 from NAS Whidbey Island won the heavy attack segment at the Yuma, Ariz., meet.

VF-3 from NAS North Island, flying the F4D *Skyray* won the All-Weather Fighter competition; while VF-41 from NAS Oceana, flying the F3H *Demon*, won the *Sparrow* missile firing competition.

VA-56 from NAS Miramar won the jet light attack event, while VA-85 from NAS Oceana copped the propeller light attack event.

VA-232 from MCAS Kaneohe Bay, Hawaii, won the day fighter event.

News of Ships and Navy Units

Among the goings-on within the Navy, we hear that:

- *Mine Division 93* has returned to its home port of Long Beach after a six-month cruise in WestPac.

- Seven LSTs—*uss Tioga* (LST 1158), *Russell County* (LST 1090), *Jefferson County* (LST 845), *Snohomish County* (LST 1126), *Kemper County* (LST 854), *Outagamie County* (LST 1073) and *Polk County* (LST 1084)—of PhibRon Three have departed San Diego for a normal operational tour in the Western Pacific. They were accompanied by *uss Carronade* (IFS 1), PhibPac's only inshore fire support ship.

- *uss Tilefish* (SS 307) has been decommissioned and placed in a Reserve status after almost 16 years of continuous service.

- The Navy's deep-diving sphere, *Trieste*, is now engaging in a three-month series of explorations off the Marianas Islands.

- Of the original crew of 2500 men of *uss Forrestal* (CVA 59), 49 plank owners were on board to help her celebrate her fourth birthday.

- *uss Kearsarge* (CVA 33) has returned to her normal duties with the Seventh Fleet after giving a strenuous assist to the Nagoya, Japan, victims of a most destructive typhoon.

- *uss Randolph* (CVS 15) and *Hornet* (CVS 12) were this year's winners of the Marjorie Sterrett Award.

- *uss Cavallaro* (APD 128) has been transferred to the Republic of Korea under terms of the U. S. Mutual Assistance Program.

- A new leadership field team has been established in the Pac Flt, West Pac and MidPac.

- A citation—the Constant Vigilance Award—and the first of its kind, was awarded the radar escort picket vessel *uss Thomas J. Gary* (DER 326), home-ported in Newport, R. I., for "superior performance in completion of assignments on schedule and maintenance of outstanding proficiency, a high degree of antisubmarine warfare readiness and performance during barrier

YESTERDAY'S NAVY



On 6 Jan 1813 *uss Hornet* captured the British schooner *Ellen* off the coast of Brazil. On 8 Jan 1850 the Brooklyn Naval Drydock was used for the first time. On 19 Jan 1840 two ships of LT Charles Wilkes' expedition positively and independently identified land in the Antarctic area. On 27 Jan 1778, in the second raid on New Providence Island by American forces during the Revolutionary War, Fort Nassau was captured and 20 American prisoners were released. On 27 Jan 1942 *uss Seawolf* (SS 197) delivered ammunition to Corregidor and evacuated Navy and Army pilots from there.

ASW exercises and alertness and initiative in responses to emergency and unusual situations."

- The Naval Missile Center, Point Mugu, Calif., celebrated its 13th birthday with a full dress inspection by its CO.

- *uss Power* (DD 839) is just bursting with pride over its spanking brand new station wagon, purchased during its recent Med tour, with money from the ship's Welfare and Recreation Fund. *Power*-men claim they are the first of DesLant's destroyers to achieve this status.

- While on the recent Far East deployment of *uss Raton* (SSR 270), all non-qualified men (32 of them) who left San Diego at the beginning of the trip returned wearing dolphins pinned on their chests.

BuWeps Takes Over

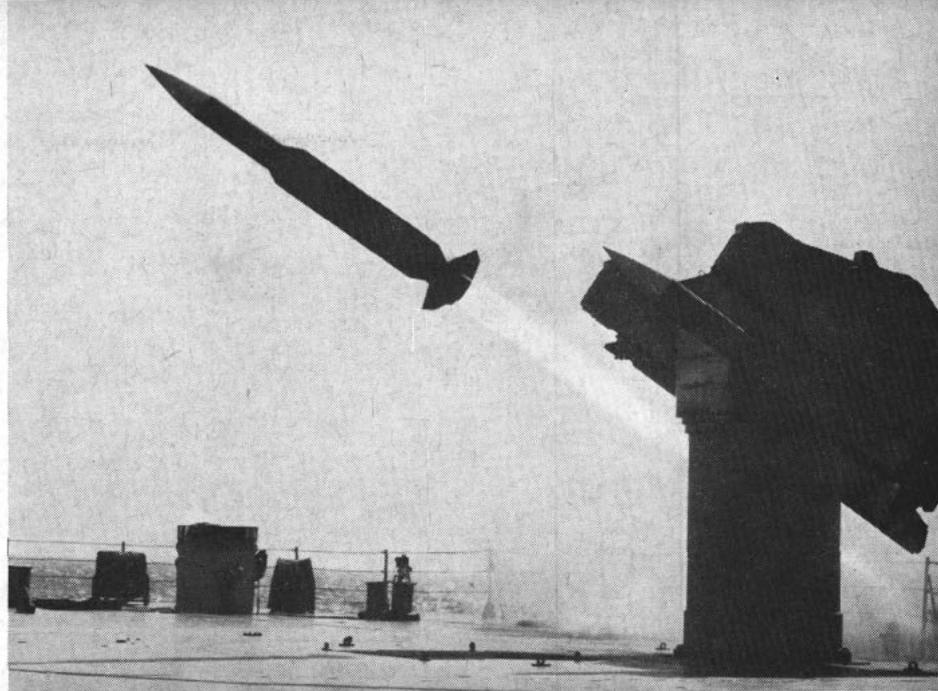
The Bureaus of Ordnance and Aeronautics have now been consolidated into the Bureau of Naval Weapons.

First chief of the new bureau that has assumed all the functions and obligations of the two older ones is RADM Paul D. Stroop, usn, a naval aviator who was formerly Chief of the Bureau of Ordnance. RADM William A. Schoech, usn also a naval aviator, is Deputy Chief.

Naval and civilian personnel of the disestablished bureaus have been transferred to the Bureau of Naval Weapons. So have the custody, jurisdiction, records, accounts and properties of BuOrd and BuAer. Funds allocated to those bureaus and the administration of contracts previously let by them have also been taken over by the new organization.

The Bureau of Ordnance, established 31 Aug 1842, as the Bureau of Ordnance and Hydrography, was one of the five original offices which made up the Navy's bureau system when it was created by Congress. CAPT William Montgomery Crane was its first chief. Its first major task was the arming of the then 69-ship Navy with muzzle-loading cannon, later replaced by Dahlgren guns and finally by modern, breech-loading naval rifles.

Some of the significant advances in naval ordnance introduced by that bureau include: the electrically controlled torpedo—used successfully in submarines of the *Holland* class in 1910; depth charges—first introduced before World War I; new



UP AND AWAY—A *Tartar* surface-to-air guided missile streaks toward its target upon being launched from the deck of *USS Norton Sound* (AVM 1).

methods of fire control; the 5-inch/38 double-purpose gun and the 6-inch/47 cruiser mount—both used extensively during World War II; the proximity fuse; and the Norden automatic bombsight, adopted by the Army Air Corps for use in World War II.

In 1943 BuOrd introduced one of the first guided missiles to be employed in wartime against an enemy. Two years later the *Bumblebee* program provided an experimental demonstration of ramjet acceleration in supersonic flight. The first air-to-air rocket developed in this country—the 2.75-inch folding fin aircraft rocket was introduced by BuOrd in 1950.

In 1954 BuOrd's *Terrier* surface-to-air guided missile was successfully fired from *uss Mississippi* (AG 128), and in 1957 it was launched from the Navy's first guided missile destroyer, *uss Gyatt* (DDG 1). One year later the *Sidewinder* air-to-air guided missile was first used in combat by Republic of China pilots over the Formosa Strait.

BuOrd was also one of the agencies which helped develop the atomic bomb.

The Bureau of Aeronautics was established as the Office of Naval Aeronautics—a part of the Office of the Secretary of the Navy—in 1914. It became a separate bureau by Act of Congress in 1921. Its first chief was RADM William A. Moffett, usn.

The year 1925, when *uss Saratoga*

(CV 3) and *Lexington* (CV 2) were launched marked the beginning of a period during which BuAer played a leading role in the development of naval aircraft, missiles and assorted aeronautical equipment.

In 1946 the FH-1 *Phantom* became the first all-jet aircraft to make successful landings and take-offs from a U. S. carrier. This was followed by such innovations as the launching of a guided missile from a submarine in 1947, a record altitude flight by the rocket research plane *Skyrocket* (D-558-2) in 1949 and the first operational use of a new steam catapult for launching jet aircraft from carriers.

Among the missiles developed by BuAer have been *Regulus I*, *Sparrow I*—credited with being the nation's first air-to-air guided missile, *Sparrow III*, *BullPup* and the *Corvus* and *Eagle* missile systems which are now in advanced stages of development.

With the establishment of BuWeps, there are now six bureaus. Besides this newest one they are the bureau of: Supplies and Accounts; Yards and Docks; Medicine and Surgery; Ships; and the Bureau of Naval Personnel, or—BuSandA, BuDocks, BuMed, BuShips and BuPers as they are abbreviated.

The creation of BuWeps is designed to cut down the time it takes to develop, and make operational to the combat forces, new and improved missiles, aircraft, weapons systems and ordnance components.

SUBRON

14



POLARIS PLANK OWNERS—A. Kushlan, YN2(SS), and N. Slater, YNT3(SS), members of first FBM submarine squadron, assemble model of *Polaris* sub.

Briefs on *Polaris*

- The U. S. Navy's *Polaris* Fleet ballistic missile will be a solid-propelled, inertially guided missile, capable of being launched from submerged or surfaced submarines as well as surface ships. It will have an initial operational range in excess of 1200 nautical miles and will have the capability to carry a nuclear warhead. *Polaris* is now in advanced stages of development. A flight test program involving two-stage solid-fuel test vehicles similar in external appearance to the final missile is underway at the Atlantic Missile Range, located at Cape Canaveral, Florida.

- The *Polaris* missile is scheduled to be ready in 1960 for service aboard nuclear-powered submarines. The first of these, *uss George Washington*, SSB(N) 598, was commissioned on 30 Dec 1959. Launch dates for *Patrick Henry*, SSB(N) 599, and *Theodore Roosevelt*, SSB(N) 600, and *Robert E. Lee*, SSB(N) 601, were 22 September, 3 October and 18 December respectively. (For additional information on Navy plans for FBM roles see page 6.)

- The combination of the missile, the submarine, and the supporting launching and handling, fire control and ship's navigation equipment plus the personnel to operate them, will

constitute the Fleet Ballistic Missile Weapon System. All aspects of the program are proceeding in parallel and interlocking channels designed to have each component ready at the target date.

- Plans for *Polaris* (named after the North Star) were first announced in January 1957. Because of the space, weight and handling limitations of its shipboard mission *Polaris* was designed to be smaller and lighter than other IRBMs. In January 1958 the Navy announced an accelerated development schedule with the 1960 target date for operational use. On the heels of this announcement came reports of successful firing of a test vehicle in the *Polaris* program on 17 Jan 1958. In ensuing months several other successful vehicle firings were reported. These test vehicles were of various shapes and sizes, designed to test in flight major systems and components designed for the *Polaris* itself.

- In September 1958, a more advanced series of test-firings began employing development test missiles close to final *Polaris* configuration. These tests are aimed at gathering vast amounts of information, via telemetry, on in-flight performance of systems and components under development for the *Polaris* missile. On 8 May 1959, a two-stage *Polaris* test vehicle accomplished all test objectives. The flight test program is con-

ducted at the Atlantic Missile Range at Cape Canaveral, Fla.

- Next to the standing launch pad at Cape Canaveral a ship's motion simulator has been installed, from which a test vehicle was successfully launched on 14 Aug 1959, under conditions approximating those encountered from a ship at sea. Following the simulated sea-going launch, a *Polaris* test vehicle was launched on 27 Aug 1959, from *uss Observation Island* (AG 154), that has been especially converted for this purpose. (See page 49.) This firing also achieved all test objectives.

- The launcher-test programs have been in progress for some time. Operations Skycatch and Peashooter, at San Francisco Naval Shipyard, are dryland operations to pioneer testing of methods of ejecting the missile. Operations Pop-up and Fishhook at San Clemente are tests from a submerged launcher.

- Like the other ballistic missiles, *Polaris* will be basically a projectile traveling a ballistic path through space, lifted to altitude and set on course by its original propulsion and guidance components, and then governed by natural forces such as gravity on its way to the target. The missiles are primarily designed for submarine use but they can be fired from surface ships just as effectively.

- A converted cargo ship—now *Compass Island* (AG 153)—was commissioned in November 1956 to develop the navigational equipment needed for accurate shipboard use of the FBM system. The result is the Navy's Ship Inertial Navigation System (SINS), which can position the firing ship with such accuracy that its missiles can strike target areas at very long ranges. SINS determines true north, true vertical ship position and speed to supply the data necessary for pinpoint firing.

- Deployed in submarines cruising the world's oceans, *Polaris* is planned to be a deterrent weapon, inhibiting any potential aggressor from striking the first blow by threat of retaliation from such hidden, mobile launching platforms.

- The nuclear-powered FBM submarines will be named for distinguished Americans. They include: *uss George Washington*, *Patrick Henry*, *Theodore Roosevelt*, *Robert E. Lee*, *Abraham Lincoln*, *Ethan Allen*, *Sam Houston*, *Thomas A. Edison* and *John Marshall*.

Pt. Mugu: Missile Center

The Navy Missile Center, Point Mugu, Calif., a modest entrant into the space age with the testing of German V-1 buzz bombs in 1946, has grown up to become the *Pacific Missile Range*—and the sky isn't necessarily the limit any more.

Pacific Missile Range is one point in a tri-pronged complex of national missile ranges. The others are the Atlantic Missile Range near Cape Canaveral, Fla., and the White Sands Missile Range in New Mexico.

The three ranges, under the direction of the Secretary of Defense, are research centers for the assembly, check-out, testing and evaluation of missiles, satellites and space vehicles; the training of personnel who may ultimately use these weapons, and the actual operational use of the vehicles.

Together they form a thoroughly integrated, coordinated program in which each service, each range and each military department complements the others in providing facilities not only for the services, but for civilian research and development agencies as well.

Now in its second year as a national missile range, PMR is basically a sea test strip 500 miles long paralleling the California coast and extending 250 miles seaward.

Rear Admiral Jack P. Monroe, USN, PMR's commanding officer, has his headquarters at Point Mugu, one of the range's two major land areas.

Instruments, communications equipment and launching pads are installed at the Naval Missile Test Facility, Point Arguello, a 19,000-acre tract which was formerly the southern portion of Camp Cooke Army Base.

Point Arguello is, among other things, the only spot in the continental United States from which a polar-orbit satellite can be safely launched.

The northern portion of the former Camp Cooke, renamed Vandenberg Air Force Base, is headquarters for the Strategic Air Command's First Ballistic Missile Division. Although not a part of PMR, Vandenberg uses the facilities of the Navy-managed range in launching Air Force satellites and space probes, and in training Air Force missile crews.

In return, the Air Force Base provides housing, messing and other administrative support to PMR.



WHAT'S MY LINE?—USS *Aeolus* (ARC 3) is one of Navy's seven ships that are kept busy repairing and laying cables strung on floors of the seas.

Extensions of the basic range are test corridors reaching thousands of miles out to sea. Over this expanse our intercontinental ballistic missiles and intermediate range ballistic missiles are put through their paces. Range ships at sea are used for tracking and collecting data from launchings. Additionally, land-based tracing stations are located on offshore islands, and at Midway, Wake and Eniwetok.

Several factors make PMR an ideal site for launching and testing missiles and satellites.

ICBMs and IRBMs are launched without the danger of first and second stages falling on densely populated areas.

Satellites may be launched in a southerly direction, permitting a polar orbit. Because of the rotation

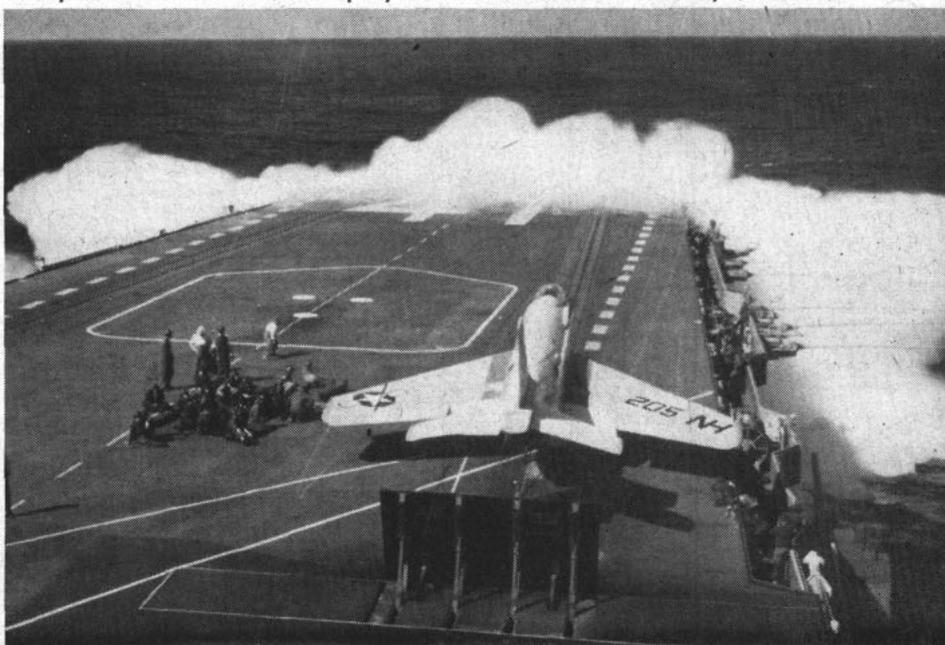
of the earth on its axis, this increases the amount of data received from outer space.

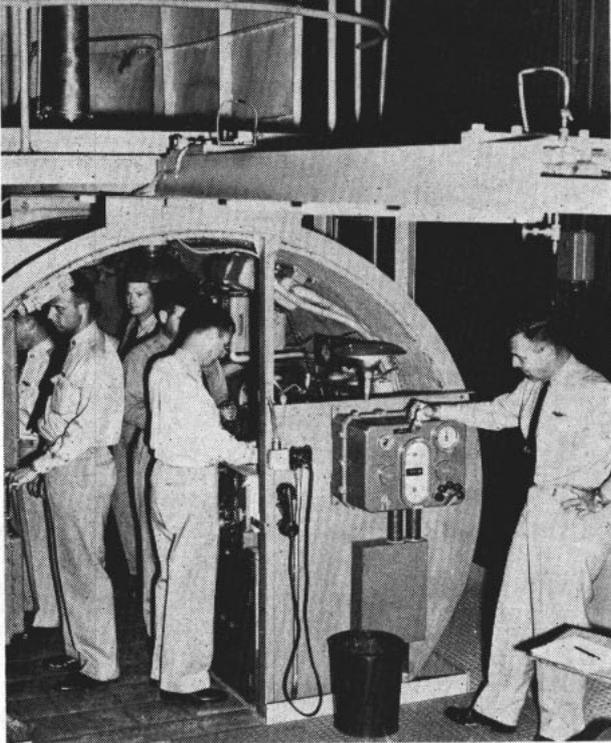
Another consideration is the nearness of some of the nation's largest aircraft and missile plants, providing a considerable saving in costs, transportation and time.

Also, the remote location of the area makes possible far greater secrecy and security than at other testing sites where the population is more concentrated.

Progress, in the less than a decade and a half since the first crude tests in 1946, has been spectacular by any standards. Those modified German buzz bombs were fired over a 200-yard track. PMR, by the time full operational capacity is reached in the early 1960s, will extend some 5000 miles to Wake Island.

SALTY START—Cat crew prepares to blast an F3H *Demon* into the sky as heavy sea sends a blanket of spray over the bow of USS *Midway* (CVA 41).





LIKE REAL — Attack teacher trains future commanding officers. Below: Students discuss sub problem at Pearl.



AT SEA—Practice attack is made on shipping and submarines during sea phase training for prospective sub COs.



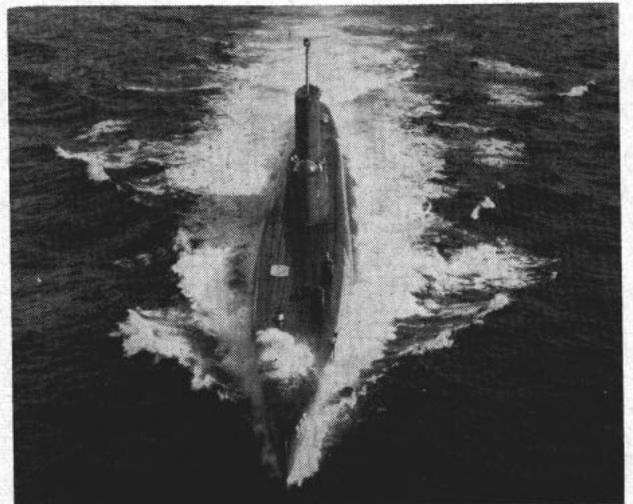
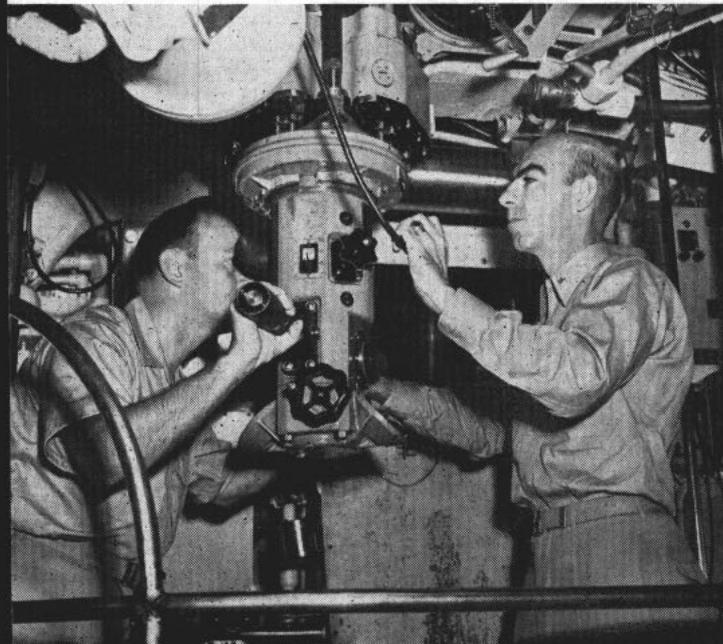
SUB COs-to-be man stations in USS Swordfish, SS(N) 579.

School for Skippers

ONE OF THE MOST intricate and complex ships in today's Navy is the submarine. This, plus the lives and money involved, puts quite a load of responsibility on the shoulders of future sub skippers, especially in the nuclear Navy.

To help them prepare to take over the command of a sub the Navy has a school for prospective submarine commanding officers located at Mare Island, New London and Pearl Harbor. In the Pacific, the first week of the five-week course is spent at Mare Island, where students learn tactical procedures and demonstrate them on the attack teacher. On this training device new skippers can review basic search, approach and attack procedures as well as fire control techniques. The balance of the course is conducted at Pearl where, except for a study of submarine force policy, the training is done at sea in subs.

Under the surface of the Pacific, students stalk and "sink" shipping guarded by antisubmarine ships and gear. In addition, future COs of the silent service practice searching out and hunting down submarines in mock-sub-against-sub warfare.



ALL HANDS

How To Earn Those Dolphins

A TWO-CREW SETUP for Fleet Ballistic Missile submarines obviously will increase the Navy's need for submariners.

So, if you hold one of 23 ratings in a variety of pay grades and if you are not now a submariner and would like to become one, get your application for Basic Submarine School in now—your chances were never better.

Here are the ratings from which applications for submarine training are desired:

- EM, EN, MM, ET, IC, SO and TM in pay grades E-4, E-5, E-6 and E-7, and designated strikers.
- QM, RM, GS, YN, CS, SM, SD and FT in pay grades E-4, E-5 and E-6.
- HM, in pay grades E-5, E-6 and E-7.
- SK in pay grades E-5 and E-6.
- SN, SA, FN, FA, TN and TA.

Navy men now afloat on Seavey who have not received orders may request either direct orders to Basic Sub School, or orders to Basic Sub School via the Class "B" school of their choice, if they meet eligibility requirements.

Previously, if you were serving on a tour of shore duty, you had to complete that tour before you could be ordered to Basic Sub School. Now you must complete only a year of such a tour to become eligible. Don't wait until you have put in that year on shore duty to submit your application, however. Get your request in as early as possible to permit arranging for and ordering your relief, and to insure availability of quotas at Class B schools if requested.

Eligibility requirements for assignment to Basic Submarine Training are:

- Have 24 months' obligated service commencing with the convening date of the class to which ordered.
- Be a volunteer for sea duty in submarines.
- Have a minimum combined ARI and MAT or ARI and MECH score of 100, or a minimum combined GCT and ARI score of 100. Requests for waivers will be considered on individual merits. Such requests must be substantiated.
- Be physically qualified for submarine duty according to the *BuMed*

Manual (see Article 15-29).

- Have demonstrated evidence of emotional and mental stability and maturity. The absence of these is often reflected by a poor service record.

- Age limits are purposely not established, since age often does not accurately measure a man's stamina and flexibility. When a man over 30 years of age requests submarine training, his CO must comment on his stamina and flexibility.

Once you complete the eight-week Basic Submarine Course at New London, Conn., one of several things could happen.

You might go directly to nuclear-power school. One fourth of each Submarine Nuclear Power Class is made up of direct input from Basic Submarine School.

The requirements, as outlined in Chapter 11, *Enlisted Transfer Manual*, in brief are:

- Be a USN HM in pay grades E-6 and E-7, or an MM, EN, ET, EM, IC in pay grade E-3 through E-7.
- Be designated "Qualified in Submarines" except in the case of the direct input we mentioned above.
- Be a volunteer for the program.
- Have a minimum combined test score in ARI/MECH of 105.
- Have a minimum of 40 months' obligated service at time of reporting for course of instruction.

While MM, EN, IC, ET and EM are all source ratings, and all have an opportunity for going direct to Nuclear Power Training from Basic Submarine School, your chances are especially good if you are an EN or MM.

You might, in a few cases, be ordered for precommissioning and duty aboard an SSB(N). At a later date, and again depending on your rating, qualifications, motivation, etc., you could apply for one or more of the specialized courses of instruction under the *Polaris* program.

Most Basic Sub School graduates, however, are ordered to duty either in conventional submarines, or to a non-nuclear billet in a nuclear submarine. If you are one of these, you should become a qualified submariner about six months after reporting aboard. Once qualified, you can (again depending on your rating)

submit your request for the nuclear power or FBM programs.

The majority of men now being ordered to FBM submarines are already members of the submarine service. If you are now a submariner, serving in either a conventional or nuclear-powered submarine, you should submit your request for FBM submarine duty to either the COMSUBLANTREP at EPDOLANT, or the COMSUBPACREP at EPDPAC.

If you are eligible for duty in an FBM submarine, your name will be placed on a waiting list at one of those two locations. You would then be ordered to a new construction submarine approximately ten months in advance of its tentative commissioning date.

Source ratings for FBM submarines are: TM, QM, GM, FT, GS, ET, SO, RM, MM, EN, YN, SK, CS, SD, FN and SN. Although there will not be billets in all pay grades, men in all pay grades are encouraged to apply in the event substitutions are necessary.

Before reporting to their assigned ship, QM, ET, FT, TM, GM, GS, RM and SO ratings are normally ordered to attend courses of instruction ranging from three weeks to six months. Periods under instruction and while awaiting commissioning are considered sea duty if ordered from sea duty.

Men ordered to SS(N) or SSB(N) new construction will not be transferred prior to one year on board after commissioning.

To be eligible for duty aboard an FBM submarine, you must:

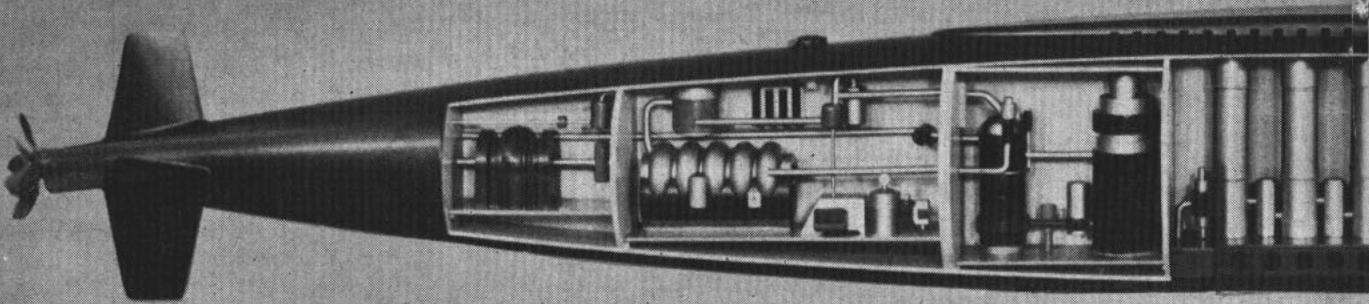
- Be eligible for SECRET security clearance.
- Have obligated service of 24 months from commencement of course of instruction, or date of reporting to the Supervisor of Shipbuilding in the case of men not receiving instruction.
- Be one of the source ratings.
- Be, in almost all cases, designated SS.
- Not be on current Seavey. (Men extended off Seavey by COMSUBLANT or COMSUBPAC are eligible for such duty.)

That covers the procedures.

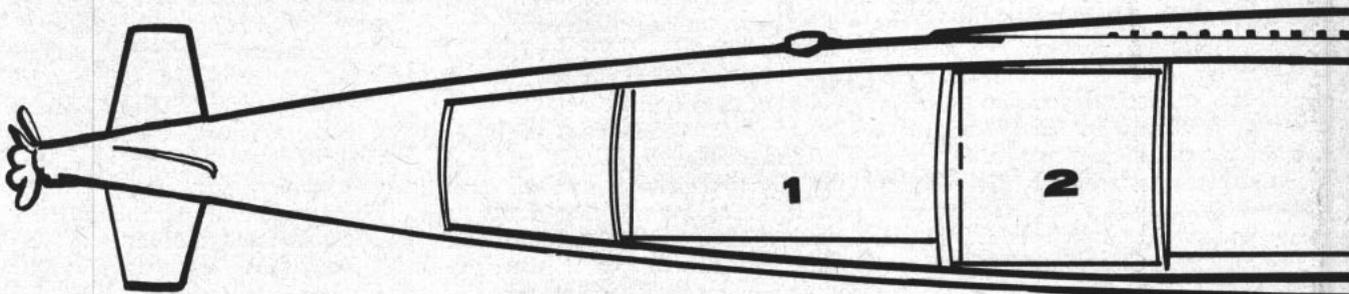
You may volunteer for a particular FBM submarine, and every effort will be made to assign you to that submarine. Now it's up to you.

FLEET BALLISTIC MISSILE S

USS George Washington SSB(N)



- | | | |
|------------------------------|---------------------------------|---------------------------------|
| 1 ENGINE ROOM | 4 SHIP'S CONTROL CENTER | 7 SHIP'S CONTROL CENTER |
| 2 REACTOR COMPARTMENT | 5 MISSILE CONTROL CENTER | 8 MISSILE CONTROL CENTER |
| 3 MISSILE COMPARTMENT | 6 GYRO ROOM | 9 NEGATIVE TANK |



SS(N)—NUCLEAR



Nautilus, SS(N) 571



Thresher, SS(N) 593



Skate, SS(N) 578



Skipjack, SS(N) 585

SILHOUETTES OF U.S.

SSB(N)—FLEET BALLISTIC MISSILE



Ethan Allen, SSB(N) 608



George Washington, SSB(N) 598

SS—SUBMARINE



Piper (SS 409)



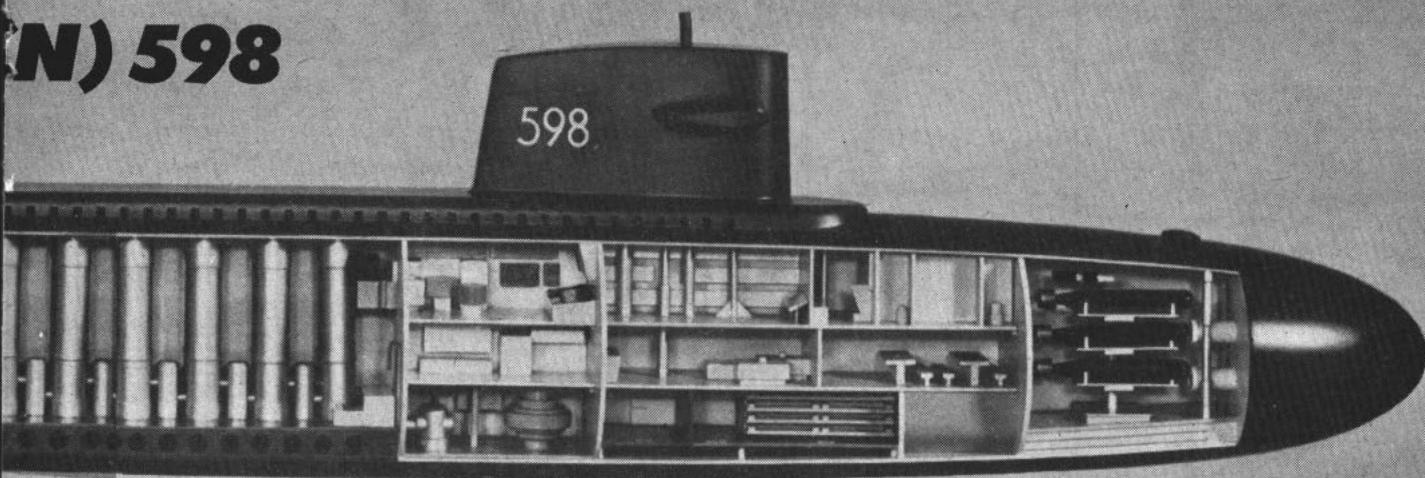
Tang (SS 563)



Barbel (SS 580)

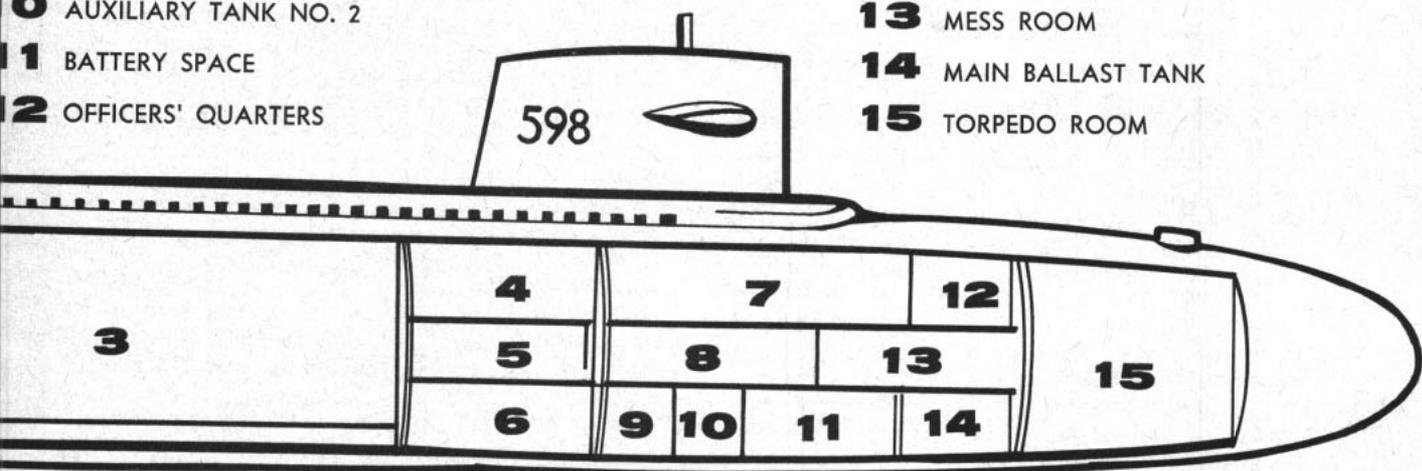
SUBMARINE (NUCLEAR)

(N) 598



- 0 AUXILIARY TANK NO. 2
- 1 BATTERY SPACE
- 2 OFFICERS' QUARTERS

- 13 MESS ROOM
- 14 MAIN BALLAST TANK
- 15 TORPEDO ROOM



U.S. NAVY SUBMARINES

AGSS—AUXILIARY



Albacore (AGSS 569)

SST—TARGET AND TRAINING



Barracuda (SST 3)



Mackerel (SST 1)

SSG—GUIDED MISSILE



Halibut, SSG(N) 587



Grayback (SSG 574)

SSR—RADAR PICKET



Triton, SSR(N) 586



Sailfish (SSR 572)



Pompon (SSR 267)

Prepared by ALL HANDS Magazine

THE WORD

Frank, Authentic Advance Information On Policy—Straight From Headquarters

• **SUBMARINE TRAINING**—Applications for submarine training are now being accepted from Naval Academy and Regular NROTC midshipmen.

This is the first time since World War II that applications have been accepted from potential submarine officers who have had no previous commissioned sea duty. The applicants must receive commissions in the unrestricted line. Those selected will go directly to the Submarine School at New London, Conn., without intervening duty in surface ships.

Before this change, officers applying for submarine training had to have enough experience in surface ships to qualify them as officers of the deck. The move is being made to help solve the problem which arises in the surface Fleet when excessive numbers of surface-trained junior officers go into submarine training.

Besides midshipmen, commissioned officers in the grades of ensign and lieutenant (jg) are also invited to apply for submarine training. These officers will continue to make up three-fourths of the annual input.

The course at New London lasts about six months. It leads to duty aboard submarines and ultimate qualification in them. By going into submarines an officer has the opportunity to be assigned to responsible positions early in his career. He also gets a chance at early command assignment.

Naval Academy and Regular NROTC officers who apply for—but

are not ordered to—submarine training, still remain fully eligible to re-apply at a later date. Those midshipmen who cannot be ordered to submarine school because the class is filled will have the change to apply again after one year of commissioned service. However, consideration for subsequent classes will not be automatic. Officers not selected must apply again under the latest BuPers Notices on the subject.

Lists of the officers selected for this training will be issued in BuPers Notices indicating the class to which each successful candidate will be ordered. The classes convene in January, April, July and October. Graduates will be ordered to ports from which submarines normally operate—New London, Norfolk, Charleston, Key West, San Diego or Honolulu.

Additional information on submarine training for officers may be found in BuPers Inst. 1520.6H.

• **MORE RATE CHANGES**—The in-flight aerial phase of the training at the Photographer's Mate Class "A" School has been eliminated. Regular Navy and TAR (Training and Administration Reserve) PHs are now being assigned a PH designator rather than a PHG or PHA.

Those Photographer's mates who are now PHG (Photographer's Mate, Cameramen) or PHA (Photographer's Mate, Aerial Cameramen) will keep their special designation for the present time.

Regular Navy and TAR personnel who plan to compete for advancement to photographer's mate

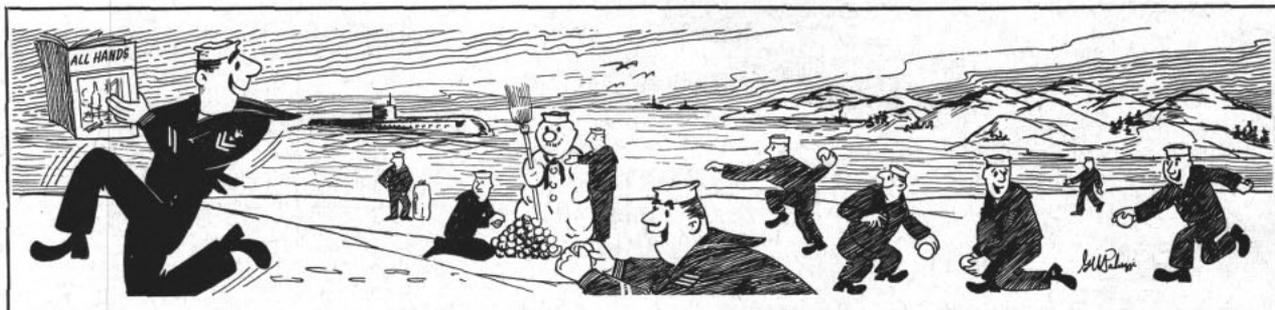
third class in February 1960 will take either the PHA3 or PHG3 examination, but successful candidates will be advanced to PH3. Commencing in August 1960, only the PH3 examination will be given.

• **FROGMEN WANTED** — Naval officers are needed for underwater demolition training. Selected men will attend a 16-week course at the Naval Amphibious School at Little Creek, Va., or Coronado, Calif.

Applicants must be in the grade of ensign, lieutenant (junior grade), or lieutenant, and have an officer designator of 110X or 6XXX (formerly 17XX).

Anyone interested in this training should review his qualifications very carefully before submitting an application. The attrition rate among UDT candidates is high because many students misunderstand the requirements or are just unable to meet the high standards.

Underwater Demolition Teams are assigned the mission in an amphibious operation of conducting pre-assault reconnaissance of enemy beaches and, where necessary, to improve the approaches to the landing beach. This work requires superior qualities of courage, determination, discipline and physical stamina. Members of a UD Team often must swim for long distances carrying explosives, and are required to remain in the water for extended periods. Particularly desired in the program are career officers with 18-24 months' shipboard experience. Career rotation should provide for a two-year tour with an Underwater Demolition Team, followed by rotation to sea duty. The career aspect is important since officers with World War II experience are becoming increasingly scarce. New officers are needed in the program to fill command and supervisory billets.



SNOW GOOD to take off with ALL HANDS—Nine others who are waiting for it will give you a cold reception.

Selected candidates will be trained in a 16-week course which convenes twice yearly on each coast. Officers are ordered to report for physical conditioning two weeks before.

The training received includes hand-to-hand combat, long-distance swimming, calisthenics, small arms firing, cartography and reconnaissance of both demolition and hydrographic nature.

Interested officer-volunteers should forward their applications in duplicate to the Chief of Naval Personnel (Attn: Pers—B124).

• **BIG JOKE**—It's that time again—time to submit your cartoons to the Navy's Fifth All-Navy Comic Cartoon Contest. The rules are the same as for the preceding years and are applicable to active duty naval personnel and their dependents.

Entries must be submitted in time to reach the Chief of Naval Personnel (Attn: Pres G11) for judging by 1 Mar 1960.

Rules governing the contest were published in BuPers Notice 1700 of 23 Nov 1959. They provide that:

• All Naval personnel on active duty and their bona fide dependents are eligible to submit entries.

• Comic (gag or situation) cartoons, to be acceptable, must have a Navy theme or background and must be in good taste.

• Cartoons must be in black ink on 8 by 10½ white paper or illustration board.

• A contestant may enter as many cartoons as desired but each entry must contain the following information and statements *securely* attached to the back of the entry:

1. Full name of originator.
2. Rate/Rank.
3. Serial/File number.
4. Duty station.
5. Hometown and hometown newspaper.
6. Command Recreation Fund administrator.
7. A brief statement certifying the cartoon as original.
8. Commanding officer's indorsement "Forwarded," signed by either the commanding officer or his representative.

Type the following statement and sign—"All claims to the attached entry are waived and I understand the Department of the Navy may use as desired." Signed. . . . (Name of contestant)

Dependents should supply appropriate

data above and should make this statement: "I am dependent of (Name, Rate/Rank, etc.)"

Trophies, furnished by the Chief of Naval Personnel, will be forwarded to the respective commanding officers for presentation to the first five placemen. The winning cartoons will be published in ALL HANDS Magazine and suitable notations will be made in the "Special Services Newsletter."

• **NOW HEAR THIS**—This Navy's newest sea power presentation, "Your Navy and Your Future," has recently been distributed throughout the Naval Establishment.

The people who handle the sea-power presentation for CNO pass this word:

This year's presentation covers some very important facts. It is a 35-mm color slide presentation of approximately 30 minutes' duration. A showing of "Your Navy and Your Future" may be scheduled for presentation to either military or civilian audiences by contacting your nearest Naval Station, Naval Reserve Training Center or Naval District Headquarters.

In 1848, CNO continues, two events helped to change the world—gold was discovered in California and the Communist Manifesto was published. In 1848, an infinitesimal fraction of one per cent of the world's population was communist. Today, approximately one-third of the world's people live under the communist yoke. This jump is alarming when you consider the relatively short span of years. The communist goal is world domination—and it is being pursued relentlessly and without deviation.

There has recently been talk by the communists of world disarmament. Yet today, the Soviet military forces include 18,000 aircraft, 28 cruisers, 150 destroyers and 450 submarines. The Soviets are fully aware that the unity and survival of the free world depend upon Allied use of the seas.

Today's Navy must be equipped to meet the challenge of the limited war. It must be able to shift quickly to the scene of trouble—wherever it may be. Time is the most important factor in preventing crises from flaring into wars.

For further info, contact the Office of Chief of Naval Operations (Op-09D2), Washington 25, D. C.

Just about everything about the U. S. Navy's first nuclear-powered attack aircraft carrier, *Enterprise*, CVA (N) 65, will be big. Thus, it's not surprising that what will probably be the world's biggest and strongest anchor chain will be a part of her equipment.

An equally impressive statistic, however, concerns the time involved in making the above-mentioned chain. The initial order was placed in April 1959, and it will be some time in the spring of 1961 before work on the chain is finished—more time than was needed to build entire ships just a few years ago.

Enterprise, now building at Newport News and slated to be launched in the summer of 1961, will get a forged die-lock type of chain first designed and developed by the Boston Naval Shipyard for USS *Forrestal* (CVA 59).

Some added statistics might help to show the magnitude of the job. Two 180-fathom lengths (2160 feet) of chain will be made. That figures



out to 926 links, each about 28 inches long, 17 inches wide, and five inches thick. Over-all weight will be 333,360 pounds—more than 166 tons.

Die-lock links are made of two forged pieces, both roughly U-shaped. Two stems of one piece contain a series of paralleled indentations, giving them the appearance of screws. The socket piece has holes at each end of the U. In joining the two pieces to form a link, the pierced socket section is heated, then the stems of the other section are thrust into the holes. The socket section is then pounded with a 25,000-pound drop hammer, forcing its material around the indentations in the stems in die blocks.

The drop hammer presented its own special problems. The impact of a single blow is estimated to equal that from an automobile travelling 60 miles an hour brought to a dead stop in a quarter of an inch. A lot of time and effort went into minimizing the effects of such blows on buildings and equipment as much as possible.

Will the chain be strong enough? Well, tests show it will have a breaking strength of more than 2,500,000 pounds—more than enough, its builders feel, to handle any strain that *Enterprise* will put it to.

LETTERS TO THE EDITOR

Single Screw Subs

SIR: In a recent article about *uss Skipjack*, SS(N) 585, you stated that *Skipjack* and *uss Albacore* (AGSS 569) were the only two single screw submarines.

As long as the Navy's smallest—and finest—submarines, *uss Marlin* (SST 2), and *uss Mackerel* (SST 1), are operating, we must contest that statement.—The Crew, *uss Marlin* (SST 2).

SIR: I just finished an article on the "flying" *uss Skipjack*, SS(N) 585, in the Today's Navy section of ALL HANDS.

You stated that all the other active nuclear-powered submarines, and all conventional subs (except *uss Albacore*, AGSS 569) are driven by twin screws.

I believe you made a booboo by forgetting two of the best boats in the Fleet. Both *uss Mackerel* (SST 1) and *uss Marlin* (SST 2) currently based in Key West, Fla., are driven by a single screw.—C. Holst, EM2(SS), USN.

• *Don't feel hurt. You weren't the only ones neglected. We have since discovered that we also overlooked three others—uss Barbel (SS 580), Blueback (SS 581) and Bonefish (SS 582)—driven by a single propeller. One apiece, that is.*

These three ships, by the way, are the last diesel-electric submarines built. All other submarines under construction or planned are nuclear-powered.—Ed.

Assignment of Senior, Master Chiefs

SIR: Ever since the E-8 and E-9 pay grades were established I have been hearing rumors about their assignment to shore duty. Therefore, I would appreciate your answering these queries for me:

1. Does the Chief of Naval Personnel plan to assign E-8s and E-9s to either recruiting duty or instructor duty with NROTC units?

2. Will E-8s and E-9s be assigned to shore duty through Seavey?

3. If they will be assigned through Seavey, what will the normal tour of sea duty be for SKCSs and SKCMs?—J. M., SKCS, USN.

• *It is very probable that E-8s and E-9s will be assigned to recruiting duty and instructor duty with NROTC units.*

One down and two to go.

Yes, they will be assigned to shore duty through Seavey.

Two down and one to go.

The normal tour for E-8s and E-9s will be the same as that for E-7s in the same rating, so an SKCS or an SKCM would normally get the same length of tour as an SKC.

Three down and none to go. How-

This section is open to unofficial communications from within the naval service on matters of general interest. However, it is not intended to conflict in any way with Navy Regulations regarding the forwarding of official mail through channels, nor is it to substitute for the policy of obtaining information from local commands in all possible instances. Do not send postage or return envelopes. Sign full name and address. Address letter to Editor, ALL HANDS, Room 1809, Bureau of Naval Personnel, Navy Dept., Washington 25, D. C.

ever, to show you how big-hearted we are, we'll throw in this extra bit of information.

Pending a solution to the problem of including billets for E-8s and E-9s in personnel allowances, district and Fleet distributors have been directed (by BuPers Notice 1306 of 4 May 1959) to make sure personnel in these pay grades are assigned to billets commensurate with their indicated capabilities.—Ed.

Meals in MSTs Ships

SIR: I was stationed in the Canal Zone and after 29 months I was granted 30 days' leave to take my wife and child home to remain in the United States.

For my trip to the U. S. aboard USNS *Goethals*, I paid a mess bill for my wife and son of \$18.38 and for myself of \$21.25.

Disbursing stopped my commuted rations the day I left Naval Station, Rodman, C. Z., yet the personnel office told me that I was still in a duty status until my leave started in the United States.

Why was I charged for my food

You Can Take That Exam

SIR: On 16 Jun 1957, I was appointed RMCA. Since most terminal eligibility dates are set at 16 May, it looks as though I will be missing out on the E-8 examination by one month.

This disturbs me because I was originally scheduled to make chief on 16 May 1957, but since the Navy was short on funds, the promotion was put off one month.

For advancement purposes, will the original 16 May date be used?—H. C. M., RMCA, USN.

• *You don't have to worry about missing an examination because of that one month. The E-8/E-9 examination date has been rescheduled. It is now given annually in August.*

You are eligible, insofar as time in rate is concerned, to take the E-8 examination in August 1961.—Ed.

when I was still in a duty status? And since I was still on duty, why can't I be reimbursed for my mess bill?—J. H. M., BMI, USN.

• *You were not charged for your food while you were on board that MSTs ship. As an enlisted man in a duty status, your food and quarters were furnished. That \$21.25 you paid was a transportation charge incidental to the furnishing of these services. The charge is authorized under MSTs tariff rates.*

Accordingly, there is no authority under which you may be reimbursed for this charge, nor any authority whereby per diem may be authorized under these circumstances.—Ed.

Keeping Up and Getting Ahead

SIR: In 1953 I completed the Navy training courses for AD1 and ADC, plus the General Training Course for PO1 and CPO. Neither course at that time had a NavPers number.

Since then I have completed the new course, *Military Requirements Petty Officers 1 & C*, which superseded the old GTC.

I have been taking the test for AD1 since 1954, and every time I'm recommended, I find it almost impossible to convince the Education Officer that the courses I have completed are the same ones which now have a NavPers number.

Is there any way that I can get those courses entered in my record by NavPers number so I don't have all this trouble every time?—J. R. W., AD2, USN.

• *Normally the completion of a training course will satisfy the training course requirement for advancement. If an earlier course is superseded and will no longer satisfy this requirement, the Chief of Naval Personnel will issue a notice to this effect in each particular instance.*

In your rate, you are currently required to complete two courses, "Aircraft Engines" (NavPers 10334-A), and "Aircraft Propellers" (NavPers 10336-A) before you can compete for AD1.

These will soon be replaced and superseded, however, by an AD1 and ADC handbook (NavPers 10340). Although the book was published in July 1959, the enlisted correspondence course has not yet been published. It should be available early in 1960.

At that time, a notice will be issued which will require you to complete the new ECC before competing for advancement.

It seems to us, however, that getting credit in your record for a course taken

many years ago isn't really to your advantage. Since ADI is rather difficult to make, it would seem a good idea to re-take the course. In that way, you erase the doubt in the mind of the Education Officer; the courses will be properly recorded in your record by NavPers number; and you will benefit from the extra knowledge, and maybe a new crew.—ED.

Postal Clerk Nominations

SIR: Article B-1206 (2) of the BuPers Manual states that:

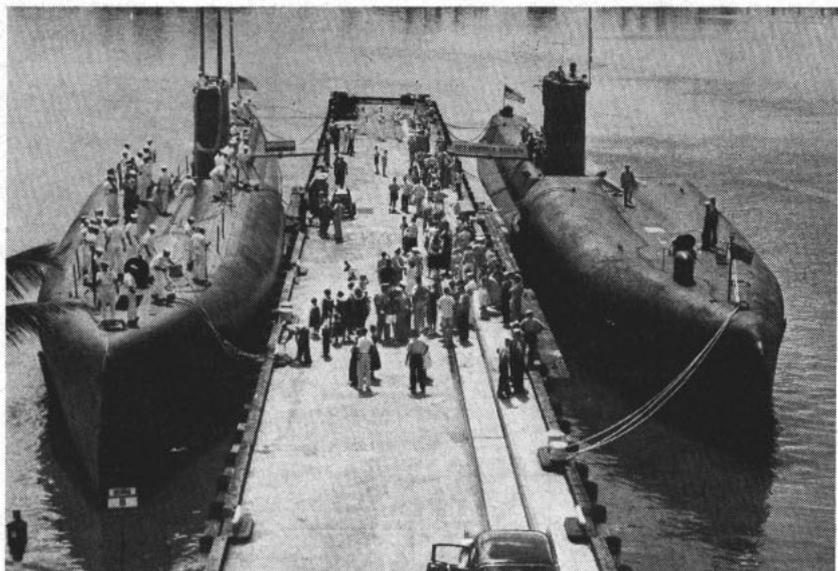
"No nomination received by the Chief of Naval Personnel will be disapproved upon receipt. When it is discovered by the Chief of Naval Personnel that a person nominated as Navy Postal Clerk or Assistant Navy Postal Clerk is not qualified in accordance with Article B-1203, such nomination will be approved and forwarded to the accountable postmaster, and a directive will be forwarded to the nominating activity, requiring the immediate removal of such person from postal duties. Upon receipt of this directive, the Commanding Officer will comply with Article B-1207."

Does this mean that after a man's nomination has been approved by the Chief of Naval Personnel, the man must be removed immediately from postal duties, and a request for revocation of his designation be forwarded to the Chief of Naval Personnel? Why is the nomination of a "not qualified" nominee approved in the first place?—R. S. S., CAPT USN.

• Yes—confusing as it may seem at first glance—the article does mean just that.

As usual, there is method behind the Navy's apparent madness.

Under Article B-1205 (2) of the Manual, naval postal clerks assume responsibility for the functions of their post offices, including all the necessary finan-



MISSILE MASTERS—Sister ships USS Growler (SSG 577), left, USS Grayback (SSG 574), built to fire Regulus II missile, are home-ported at Pearl.

cial transactions, on the date they are actually designated. In practically all cases this is the day the Designation of Naval Postal Clerk (DD Form 523) is prepared.

By the time the Chief of Naval Personnel (Pers F321) receives the nomination, the man is already handling the duties of a postal clerk. For legal reasons, the period during which he actually performs these duties must be covered by a properly executed designation and revocation.

Therefore, even though review of the Form 523 shows the man is unqualified, the Chief of Naval Personnel approves the nomination and forwards the form to the appropriate accountable postmaster. By separate correspondence, the responsible commanding officer is told why the man is not qualified and revocation of designation is requested.

This way, there is an official designation and revocation on file to cover the nominee's time spent in the job.—ED.

Fights Firpo, Feels Fine

SIR: I too served in USS Shawmut and I can verify everything Chief Paul Forster says in the June issue for I served as his first mech when he was flying in the old F5Ls.

Forster was my chief and plane captain, and I was an MM2c(A) at the time. At that time, in the twenties, I was attached to the NC-9; the NC-10 had LT (later Admiral) Felix Stump as pilot.

Tom Maxted (known as Sailor Maxted) who was a second class boatswain's mate, was a mild congenial fellow as a shipmate. I was aboard the old New York in Balboa, Panama, when he won the Navy heavyweight title from Bob Grant, CGM.

Maxted did fight Firpo in Jersey City, and I think he fought a draw. I know it was shortly before Firpo knocked Jack Dempsey out of the ring, so he (Maxted) must have been a pretty good fighter.

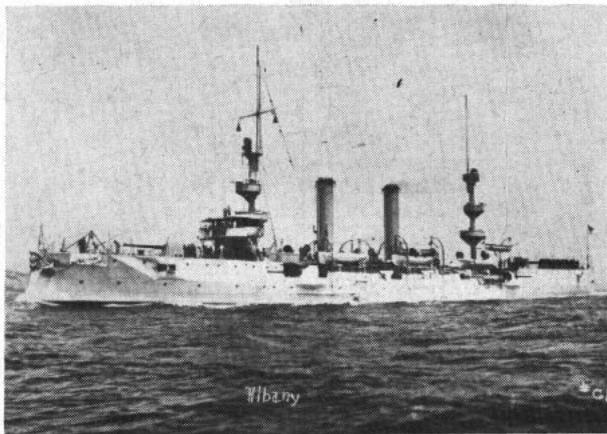
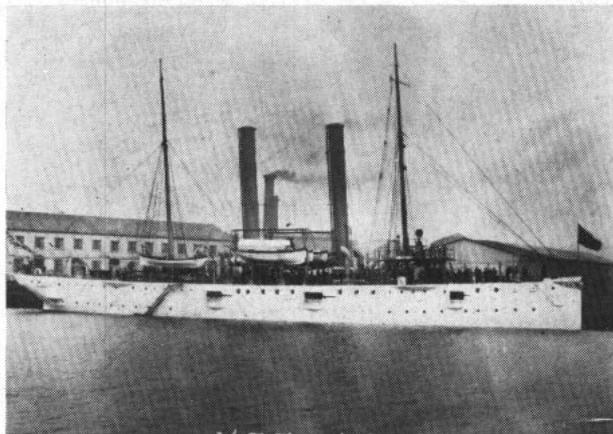
As for Chief Forster, he was a wonderful fellow to work for and an excellent mechanic. It used to be said among the plane crews: "If it isn't in supply, see Chief Forster. He carries enough spare parts in his plane to make another engine."

That was the period in which we used to swipe cans of ether from the sick bay to start our motors on a cold morning, as we had priming cups on those old Liberty planes.—Steve V. Boggs, ADC, USN.

• Thanks for your added notes on the old days in Shawmut. Now, does any one have anything to add on the Firpo-Maxted match?—ED.



EXCLUSIVE LADY—Navy's only aviation supply ship, USS Jupiter (AVS 8), carries out mission of testing, supplying the Pacific Fleet by helicopter.



BACK IN 1901—Gunboat USS Nashville, cruiser USS Albany (rt) sailed from Philadelphia to join European Squadron.

An Oldtimer Recalls Ships of the European Squadron

SIR: The letters from old-timers, which you have published in recent months—particularly the one about our “one-ship fleet” in the Mediterranean in the January issue—bring to mind the days when we established a European Squadron after the Spanish-American War.

The order went out some time early in 1901 (I believe in May). The first three ships assigned to this duty were the cruiser *uss Albany*, the gunboat *Nashville* and the old cruiser *Chicago*. At the time, *Albany* and *Nashville* were both at Cavite, Philippine Islands, but whence *Chicago* came, I don't remember.

Albany and *Nashville* left Cavite for the Mediterranean on 3 Jul 1901. They made stops at Hong Kong; Singapore; Colombo, Ceylon; and Port Victoria on the Island of Mahe, in the Seychelles (Indian Ocean).

After leaving Port Victoria, CAPT Joseph Edgar Craig had a signal hoisted authorizing *Nashville* to proceed to Aden, Arabia, on her own. (*Albany's* top speed was 21 knots. *Nashville* was a very slow ship.)

Albany was soon kicking up her heels, for we wanted to get to Aden fast. However, that night a sudden and furious storm arose. About 2300, two men were washed overboard from the poop deck. The two large copper life buoys with self-lighting torches were tossed overboard, and we searched for hours—but neither the men nor the buoys were found. Next morning, a fellow manning the ash whip went overboard, bucket and all. We recovered one of the bodies and later buried him in Aden.

The captain was worried, for it seemed impossible that the tall-stacked, topheavy *Nashville* could survive a storm which we had barely conquered. It was therefore an anxious moment as we rounded the promontory into Aden and looked for the gunboat. Lo

and behold, there she was lying peacefully with coaling screens over her sides. Lighters were alongside and “coaling ship” was in full progress. In changing course, *Nashville* had missed the storm entirely.

Our next port of call was Suez, at the south end of the canal, where we received the sad news that President McKinley had been assassinated. Then, it was through the canal and on to Naples. The European Squadron (as it was officially known) was now established, physically.

Genoa became our coaling base, and Villefranche was considered our home port. Frequent visits were made to such places as Leghorn, Messina, Palermo, Algiers, Marseilles and Athens. Early in 1902, while we were at Naples, the new battleship *uss Illinois* arrived to become flagship of the squadron—RADM Arent Schuyler Crowninshield in command.

Meanwhile, since we'd arrived in the Med, there was plenty of opportunity to hobnob with royalty, who seemed to be everywhere, ashore and afloat, in those days. Once, while we were in Villefranche, Grand Duke Michael of Russia paid us a visit. It was at noon. Tables were set on the berth deck and, since it was Thursday, there was a large iron pot on the deck containing bean soup. The duke, curious, asked what was in the pots.

“Uh,” the captain hesitated, “—uh, that is soup a la mode.”

“Ah,” said the duke, and the procession moved on.

At the end of May we headed for Gibraltar; Lisbon, Portugal; and Southampton, England. For the Fourth of July, we hastily skipped across the Channel to Cherbourg, France, where we fired the salute. After that, we were scheduled for a tour of Scandinavia and Russia, so we headed for Christiania, Norway (which you know as Oslo, the national capital).

Up the Christiania Fjord we steamed—*Illinois* leading and *Albany* (senior captain) bringing up the rear—close column (200 yards). We were proceeding at a good clip. On each side of the fjord the people stood and waved. Practically every home had a flagpole. The Norwegian flag was dipped constantly, and we, of course, replied in kind. Captain Craig walked from side to side, bowing and saluting. It was a parade all the way.

Every good thing must come to an end—but not always as suddenly as this did.

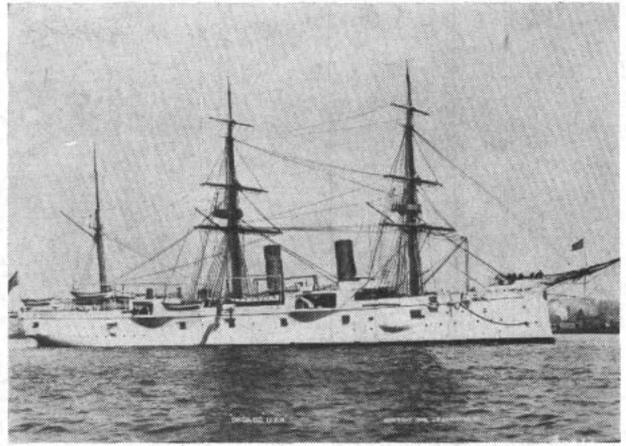
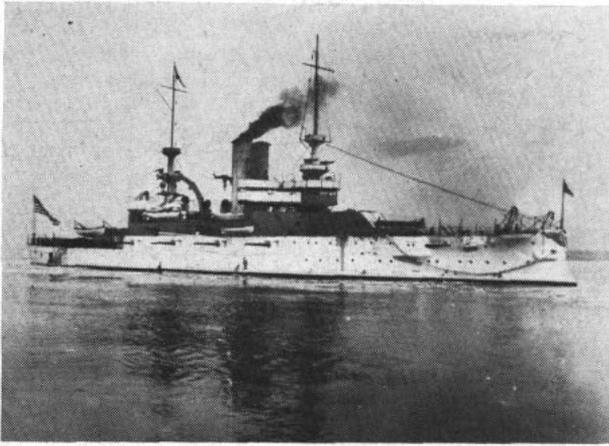
Just as *Illinois* was about to enter the harbor, she hit a hidden rock known locally as “Dyner” (in English: the pillow). The rest of us just barely missed piling up. Since we were steering in close formation, I naturally had my eyes on the other ships. Seeing the sudden stop of *Illinois*, I swung sharp to port and quickly straightened out again, nicely missing *Chicago*. But it was close.

Divers found a large gash in *Illinois*, but after the application of a couple of “collision mats,” and some pumping, she was in no danger. Accompanied by *Chicago*, she proceeded at once to England for drydocking.

After 10 days, we proceeded to Stockholm, Sweden, then to St. Petersburg (now Leningrad), Russia. En route, we expended our allowance of ammunition with our 6-inch 50 cal. Armstrong guns, our 4.7-inchers and others. One salvo, from the 6-inch after gun, took about a foot-and-a-half of muzzle along with it.

In the Russian harbor we were met by the Tsar's yacht, *Standart*, carrying the Tsar and Tsarina, and the Dowager Queen of Greece. From St. Petersburg, we were off to Copenhagen, Denmark; England; and then back to the Mediterranean.

In November we started west. The European Squadron was to rendezvous



OLD AND NEW—New battleship USS *Illinois* joined Squadron in 1902. Rt: Old cruiser *Chicago* was original member.

with the South Atlantic Squadron at Port-of-Spain, Trinidad. The two squadrons merged and sailed under sealed orders that directed us to assume the role of an enemy of the United States. As such, we were to proceed to Puerto Rico to attack and/or capture ships and ports defended by the combined Atlantic Fleet and the Caribbean Squadron.

Early one morning we entered Mayaguez harbor and mined it after us. The place was "defended" by a small gunboat which fled along the shore. One of our ships asked permission to capture the gunboat, but the admiral signaled, "No, let her go and break the news."

At the moment, the "defending" fleet was in the vicinity of San Juan, on the opposite side of Puerto Rico. Upon completion of "Search Problem," as it was called, the entire Fleet repaired to Culebra (after Christmas of 1902) for maneuvers under command of Admiral of the Navy George Dewey, whose flagship was the yacht *Mayflower*. At 0800 we'd up anchor at Culebra, head toward St. Thomas in the Virgin Islands for maneuvers, then we'd return to Culebra in the balmy evenings.

The reason behind the maneuvers was a touchy diplomatic situation involving Venezuela, against which Germany, England and Italy had declared a formal blockade on 20 Dec 1902. Before long *Albany*, the fastest ship in the Fleet, was dispatched to San Juan to pick up our Minister to Venezuela and take him to Caracas to help settle the dispute. The trip was made at full speed (forced draught). When we got to Caracas, German and English men-o'-war were also present.

Afterward, we returned to Culebra. There, our CO, CDR John A. Rodgers, paid an official call on Admiral Dewey. As we were about to shove off, Admiral Dewey said, "I must pay a visit to your beautiful ship."

We had barely reached *Albany* when a dispatch boat from San Juan, flying the "five of clubs," arrived. It carried

orders for *Albany* to proceed at once to Boston, Mass., to have her damaged after 6-inch gun replaced with the newest type of fast-shooting 5-inch then coming in.

In minutes, coaling gear was brought out, and barges full of "black diamonds" came alongside. Soon, "coaling ship," which lasted until late at night, was in full swing.

In the midst of all this, Admiral Dewey came aboard for his visit. "No apologies needed," he told the captain, "I know."

Next morning, at 0700, *Albany* was underway. As she stood out of the harbor, all the bands in the Fleet were playing and the crew members were cheering.

Off Cape Hatteras we ran into one of those heavy January storms, losing the gig, two cutters and one whaleboat. The ship was coated with ice when we reached Boston.

From Boston we moved to the Brooklyn Navy Yard. Then came the Azores and Gibraltar—and we were back in the Mediterranean—but not for long. Trouble was brewing in the Far East. *Albany*, joined by the cruisers *Raleigh*, *Cincinnati* and *New Orleans* (*Albany's* sister ship), made a dash for China, via the Suez Canal, Colombo, Singapore and Hong Kong. After that came Shanghai, Tsingtao and Chefoo, China; drydock at Nagasaki, Japan; Yokohama; a fast trip to Kobe, Japan, where we picked up our Minister Plenipotentiary to Korea; and a fast trip to Chemulpo (which you know as Inchon), Korea.

Then, it was back to Yokohama, where we joined the Fleet again and prepared hastily for a long voyage. The Fleet consisted of the battleships *Wisconsin*, *Kearsarge*, *Ohio* and *Oregon* under RADM Robley D. "Fighting Bob" Evans, and the cruisers, *Albany*, *New Orleans*, *Raleigh* and *Cincinnati* under RADM Philip Henry Cooper.

The cruisers, plus auxiliaries, proceeded to Honolulu, via Wake and

Midway Islands. Our Fleet arrived at Honolulu on 16 Dec 1903, and the Paymaster immediately ordered two things—coal and provisions, including turkey for our Christmas and New Year's dinners. A few days later, when the local housewives began ordering turkey for the holidays, they found not a gobble to be had on the entire island of Oahu.

From Hawaii, we steamed for the Philippines, via Guam. *Albany* was soon ordered to Bremerton, Wash., for overhaul and remodeling. Through an error, I was transferred to *uss Rainbow*, but as soon as the mistake was discovered, I was transferred to the gunboat *Annapolis*, which was also homeward bound.

Thus ended a very pleasant and educational voyage.

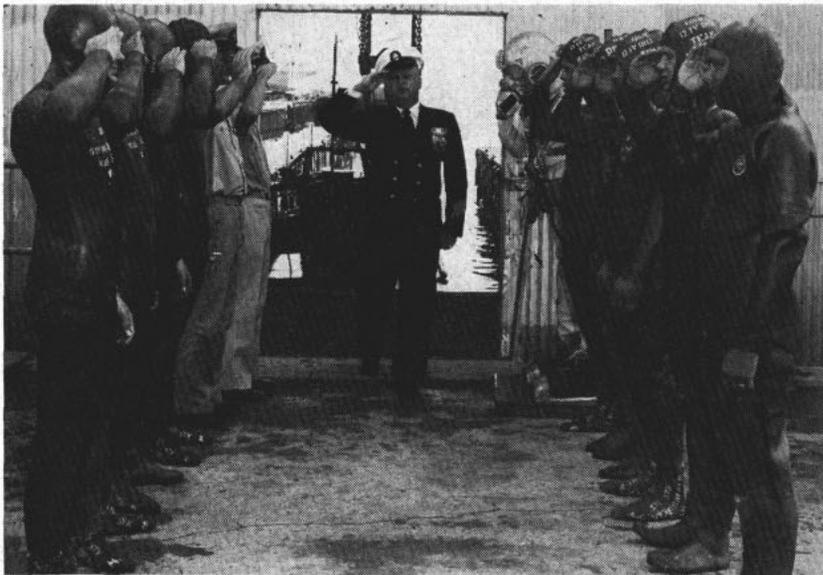
I'll never forget *Albany*. It was in June 1901, while I was in *uss Culgoa*, that I had learned *Albany* was being assigned to the European Squadron. Sensing that this would be a golden opportunity to see the world, I asked at request mast to be transferred. The captain replied, "You don't want to go to *Albany*, she is a madhouse." (In fact, some months before I came aboard, while the ship was lying in Hong Kong harbor, some scoundrel had painted *Craig's Madhouse* in tar all over her white-painted quarter.)

Coming from him, this took me somewhat aback, but after a moment's thought, I said, "Well, if others can take it, I guess I can."

So, the skipper told me, "All right, pack your bag then."

Albany was "home" to me during all my service in her. As a matter of fact, she was "home" to all of us. I don't know exactly what happened, but the few malcontents on board either left or changed their attitudes. — Oscar J. Kulle, QMC, USN (Ret).

• Thanks for bringing us "up to date" on the old Navy. We rely on Navymen like you to keep us informed on the events that occurred, way back when, just a little before out time.—Ed.



DIVER'S CHOICE—When NAS Jacksonville's leading deep sea diver (Johnny Starr, BMC) retired, he asked for sideboys attired as befitted his specialty.

National Ensign at Half Mast

SIR: We have a question about the proper ceremonies during the mourning period which follows the death of a prominent member of the military services.

On board our ship we understood Article 2192 of *Navy Regs* (Death of a Person in the Military Services) to mean that the National Ensign should have been half-masted during the mourning period for Fleet Admiral William D. Leahy, USN. Although *Navy Regs* is not clear about proper ceremonies while underway, we flew our National Ensign at half-mast until a flashing light message directed us to conform to SOPA's movement, or to full-mast the ensign while underway.—C. T. R., YN1, USN.

• *Tables in Articles 2191 and 2192, "Navy Regs," authorize half-masting of the National Ensign by all ships and stations upon the death of certain civil officials and persons in the military service. These articles are adequate authority for displaying the National Ensign at half-mast by a U. S. Navy ship underway.*

On the other hand, following the motions of SOPA is a sound move.—ED.

Switching Warrant Designators

SIR: In the fiscal 1960 warrant officer appointment list I noticed ratings which were not in their normal path of advancement.

Between the time the examination for warrant officer is taken and the actual appointment to warrant grade (upwards of two years, possibly) may an enlisted man transfer from one WO appointment list to another?

I have been told that this happened during the time when ET and FT conversion schools were in progress. Per-

sonnel selected in normal paths of advancement were transferred to the warrant electronics list upon completion of conversion school.

I have been selected for ship's clerk. My rate is YN(IC)1(SS). I have an IC Electrician NJC, have completed IC Electrician School, Basic Nuclear Power Engineering Course, qualified as an Electrical and Electronic Nuclear Powerplant Operator, and am now working as an IC Electrician in the Nuclear Power program. May I apply for transfer from the ship's clerk list to the warrant electrician list?—R.M.K., YN(IC)1(SS), USN.

• *The Navy is just as interested in having you serve in the specialty for which you are best suited as you are. The big problem involved in shifting you from one WO list to another, how-*

Extending for Shore Duty

SIR: As of September 1960 I will have 72 months of continuous sea duty. My enlistment expires that same month.

Since I am in Segment Two of Seavey, for which the cards will come out in February 1960, I'd like to know if I will still get mine even though I am a short-timer.

If I won't get a card, how can I go about making an agreement to extend my enlistment so that I will get one?—R. F. W., SD3, USN.

• *Everyone receives a card, regardless of how much obligated service he has left. However, people with less than 16 months' obligated service are put into "ineffective" Seavey.*

To see about extending for shore duty, check Para. 3.37 of the "Enlisted Transfer Manual."—ED.

ever, would be to avoid unfairness, either to you or to others on the list.

When conducting selection of USN enlisted personnel to temporary appointment to warrant grade, the Selection Board is directed to:

(a) Recommend for appointment those persons best qualified to perform in a specific category.

(b) Present their findings in recommended order of precedence for appointment by category.

To keep warrant categories filled to authorized strength at all times, appointments are made from the selection list in the recommended order of precedence.

In your particular case, you were selected for appointment to Warrant Officer, W-1 (7822). You are currently number 12 on the list for appointment in that category. In view of this, it would hardly be fair to others to place you at the top of the warrant electrician list, nor would it be fair to you to place you at the bottom of that list.

When your number is reached for the ship's clerk category, and if you are physically qualified and meet all requirements, you will be appointed Warrant Officer, W-1 (7822). After you have accepted this appointment, you may request change of designator to Warrant Electrician (7542). Rest assured that your request will get every consideration according to its merits.—ED.

Who's Senior?

SIR: A problem concerning enlisted precedence has come up on our base. Maybe you can settle it.

It concerns two third class petty officers in the same rating. One made his rate during the February 1958 exams. The other one reenlisted for his second hitch after being in the inactive reserve for over a year. During his first enlistment he made second class. When he came back into the Regular Navy in October 1958, however, he was accepted as only a third class. There was no loss of time either between his discharge and entry into the Inactive Reserve, or the Inactive Reserve back into the Regular Navy.

The chief yeoman on the base says that the second man is senior, since he was not actually reduced in rate, but only accepted back into the Navy as a third class. Therefore, his date of rate as a third class dates back to when he first made third class sometime in 1955.

I disagree and say that his date of rate is in October 1958 when he reenlisted, thereby making the second man senior.

Who's right?—J. H. R., DK3, USN.

• *The chief is right.*

According to Article C-2102 of the "BuPers Manual," which sets forth the rules for precedence, it doesn't matter whether the service is active or inactive, just so long as it's continuous.

So, according to the "book," the PO3 who first made his rate in 1955, may count that date as his effective date of advancement for precedence purposes. This is true even though some of the service was in a higher pay grade or as a member of the Inactive Reserve.

When it comes to advancement in rate, however, it's another story. The Manual does make a distinction in Article C-7204 between active and inactive duty. It states that for advancement purposes, the second man who has had more than three months away from active naval service (this article doesn't consider Inactive Reserve time as continuous service), must fulfill the service requirement for advancement starting with the day he returned to active service.

This is probably one of the few cases when a junior man in the same rate had enough time in rate for advancement before the senior one.—ED.

Heavy Lightweight

SIR: I have been reading with growing interest the various steaming records which have been claimed and then scuttled by an opponent.

Outpost (AGR 10) would like to enter the fight armed with a main battery of steaming hours for fiscal 1959. The caliber is a total of 5207 underway hours for an over-all underway percentage of 59.44.

The globe trotting ships at least have a variety of oceans and ports, while Outpost spent her time in the North Atlantic. Of the inport period, there were 21 days at Boston, Mass., and the remainder in Davisville, R. I.

We never failed to meet our schedule, which speaks well of our engineers who keep the ancient three cylinder "up and downer" chugging along.

Ship Reunions

News of reunions of ships and organizations will be carried in this column from time to time. In planning a reunion, best results will be obtained by notifying the Editor, ALL HANDS Magazine, Room 1809, Bureau of Naval Personnel, Navy Department, Washington 25, D. C., four months in advance.

• *uss California* (BB 44)—A reunion will be held in Denver, Colo., in June. For more details, write to Harold D. Dean, Box 275, Sorento, Ill.

• *uss Picking* (DD 685)—A reunion is scheduled for 16, 17 and 18 June, in Indianapolis, Ind. Write to Fred L. Bowman, 4201 Marrison Pl., Indianapolis 18, Ind.

• *Recruit Company 418, Great Lakes, Ill.*—Shipmates who served from 2 Dec 1952 to 22 Feb 1953 and who are interested in holding a reunion in June may write to Martin Qualantone, Jr., 9-09 Twelfth St., Fair Lawn, N. J.

• *uss Makin Island* (CVE 93)—All former crew members and squadron personnel who are interested in holding a reunion with time and place to be decided may write to Harold A. Knox, 5502-234th St., S. W., Mount Lake Terrace, Wash.

We have a proud ship with a "can do" crew and will tip our hat to any heavyweight who can best us.—LCDR Howard W. Jones, USN.

• *Your ship's record of sailing hours is impressive.*

How long your claim will stand is hard to say, but there is one thing of which you can be sure; if you were outdone in 1959, you'll hear of it. Meanwhile, keep steaming.—ED.

Addressing CO and Exec

SIR: The *Petty Officer's Guide*, although not an official publication, states in part: "In any naval organization there is only one 'Captain,' the regularly assigned Commanding Officer, and only one 'Commander,' the regularly assigned Executive Officer."

I know that it is proper to call the Commanding Officer, regardless of his rank, "Captain," but is it proper to call the Executive Officer, "Commander," regardless of his rank?—J. D. B., AE1, USN.

• *There is no basis for addressing an executive officer below the rank of lieutenant commander as "Commander."* This is stated in "Naval Orientation" (NavPers 16138-C), page 52:

"In any naval organization, there is only one captain, the regularly assigned commanding officer, who may be addressed as 'Captain,' regardless of his rank. There is also only one commander, the regularly assigned executive officer (if of the rank of commander), who may be addressed as 'Commander,' without appending his name. However, the present tendency is to address the executive officer as 'Commander' even though his rank is that of lieutenant commander."

In other words, if the executive officer is commander or lieutenant commander, he may be referred to as "Commander," without using his name. Other officers of the same rank aboard would be referred to by name, such as Commander Smith or Mr. Smith, as the case may be.

There are many men who seem to believe they should refer to any lieutenant commander as commander. This, too, is unfounded, although it is often mistakenly done as a form of courtesy to the lieutenant commander concerned.—ED.

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ADM NIMITZ confers with Pres. Roosevelt, GEN MacArthur, and ADM Leahy. Rt: Shipboard talk with Pres. Truman.



PACIFIC FLEET BOSS—Wounded man gets medal at Pearl Harbor Hospital. Below: Fleet Admiral Nimitz takes turn signing Japanese surrender documents.



75-Year Salute To

Next month Fleet Admiral Chester W. Nimitz, USN, will be 75 years old. At that time he will be given one of the biggest birthday parties ever. The entire nation will honor this man who so ably led the U. S. Navy's Pacific Fleet through the World War II struggle against the Japanese.

ADMIRAL NIMITZ, the U.S. Navy's senior ranking officer, has campaigned with the U.S. Navy through some difficult periods. Just 10 days after Pearl Harbor, he was appointed Commander in Chief, U.S. Pacific Fleet. It was his job to put together what was left of the Pacific Fleet and to defeat the Japanese.

On 2 Sep 1945, less than four years after he became CINCPAC, the Japanese were defeated and Admiral Nimitz witnessed their surrender terms for the United States aboard USS *Missouri* (BB 63) in Tokyo Bay.

World War II was over, but for Admiral Nimitz it was just the beginning of a new challenge. On 15 Dec 1945, he relieved Fleet Admiral Ernest J. King, USN, as CNO.

This time, instead of building up the Navy, it was his job to cut its size—without cutting its power potential. But first, there were thousands of servicemen overseas who were waiting to get home. Operation Magic Carpet was put into effect, and warships became troop ships.

Fleet Admiral Nimitz's two-year tour as CNO was his last regular Navy assignment. He was relieved as CNO on 15 Dec 1947. Since then, Admiral Nimitz has been active in the affairs of government.

ADMIRAL NIMITZ started his naval career at the U.S. Naval Academy in 1901. He graduated seventh in his class of 114 in January 1905. After spending two years at sea as a midshipman—this was required then before commissioning—Admiral Nimitz was commissioned ensign.

A third of a century later he was appointed Rear Admiral, effective 23 Jun 1938. He went on to full admiral, to date from 31 Dec 1941; and Fleet Admiral in 1944.



Listening are ADMs Leahy, Mitscher.

A Hero

In 1907, as ensign, he commanded two ships in the Asiatic Fleet, *uss Panay* and *uss Decatur*. In 1909, he took command of the First Submarine Flotilla.

During most of World War I, Admiral Nimitz served in the Atlantic Submarine Force.

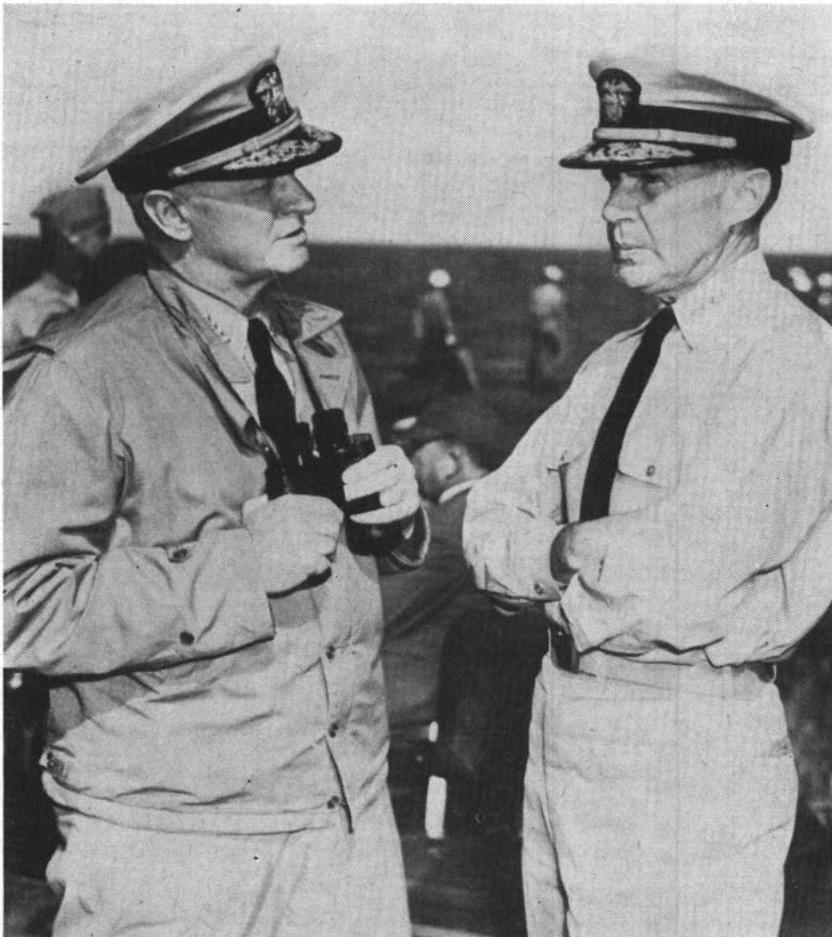
After several commands, of both submarines and surface ships, Admiral Nimitz became Chief of the Bureau of Navigation (now Bureau of Naval Personnel) on 15 Jun 1939. He was ordered to duty as CINCPAC on 17 Dec 1941.

Admiral Nimitz started at the foot of the ladder as a midshipman and now stands on the topmost rung. For his deeds and his service, this nation is paying him honor.

HERO'S WELCOME—ADM Nimitz is cheered by New Yorkers in parade.



JOINT OPERATIONS—Fleet Admiral Nimitz and then General of the Army Dwight D. Eisenhower toast in 1946. Below: Nimitz, Spruance confer at sea.



SERVICESCOPE

Brief news items about other branches of the armed services.

SMALL ELECTRIC UNITS—What next? Of all things, the Army has developed an electric light about the size of a pinhead and a radio transmitter no larger than an eraser on a pencil.

The new miniature light bulb is only one-tenth of an inch long and three one-hundredths of an inch in diameter. It will be used in many types of dials such as those on control panels in missile research and electric computers. This tiny lamp may also be used for examining cavities in scientific and industrial research, and in optical systems requiring a near-point source of light.

The radio transmitter was developed for use in ballistic studies. It can determine temperature of an artillery shell while in flight and can instantaneously radio the information back to ground receivers.

★ ★ ★

BEALE AIR FORCE BASE in California has been selected as the fifth operational base for the *Titan* intercontinental ballistic missile.

When *Titan* becomes operational, approximately 700 missileers from the Strategic Air Command will be assigned to an ICBM squadron to man the new missile installation at Beale.

The four previously selected *Titan* bases are Lowry AFB, Colo., Ellsworth AFB, S.D., Mountain Home AFB, Idaho, and Larson AFB, Wash.

★ ★ ★

SHELLS AND GUNS of the future may be equipped with special "noisemakers" designed to protect the hearing of the men who fire them.

Such a device would take advantage of a natural protective mechanism in the middle ear. Experiments at the Army Medical Research Laboratory, Fort Knox, Ky., have shown that this mechanism—known as the acoustic reflex—can be activated by a harmless noise sounded a split second before a gun goes off. How protective noise might be built into shells or guns, what the noise might sound like and how it might be delivered to the operator are questions to be answered through further research.

The reflex involves the tightening of the ear drum by the contraction of two muscles in the middle ear. The tightened ear drum, by vibrating less than it would if relaxed, is less likely to transmit vibration to the



BIG SHOT — Infantrymen demonstrate shoulder-fired 90mm recoilless rifle that will penetrate heaviest armor.



MACE MISSILE roars from ground shelter starting 500-mile trip from Holloman AFB, N. M., to Wendover AFB.

fluids of the inner ear. Captain John L. Fletcher, an Army psychologist, says it takes 9/1000ths of a second for the ear-protecting reflex cycle to be completed after a harmful sound is detected. The reflex works best against sustained sound, he reports.

Noise from a gun being fired is "impulsive," reaching a peak intensity in 2/1000ths of a second. Under ordinary circumstances it can damage the ear before the reflex has a chance to come into play. However, the Fort Knox experiments have shown that protection can be achieved by sounding a harmless conditioning tone one-fifth of a second before a gun fires and continuing it until the firing is completed.

Hearing impairment from gunfire noise can be temporary or permanent, slight or severe, depending on the individual and the quality of the noise. In any case, it is a big problem for the armed forces. Noise is also a problem for private industry, especially in factories using metal stamping machines and such.

In the tests at Fort Knox, 24 volunteers were studied after they had fired a .30 caliber machinegun which had an electric tone apparatus synchronized with it. A speaker emitting a very loud and harsh hum was placed near one ear of each of the men.

Each man fired 100 shots, with the reflex-activating tone starting one-fifth of a second before each shot. The men were given careful hearing tests afterward.

Twenty-four hours later, when any impairment that was due to the earlier firing had worn off, the same men fired another 100 shots—this time without the tone—and were again given hearing tests.

The hearing of seven volunteers, who apparently could stand higher-than-normal impulsive noise, was unaffected by the gunfire, either with or without the protective tone. The other 17 could all hear better after firing with the protective tone than they could after firing without it.

All 24 said their ears felt more comfortable firing with the tone.

In another study, comparable results were obtained among 15 tank crew members. In their case, the conditioning tone was synchronized with the tank guns and delivered to the men through their radio headsets.

ALBM, AN AIR-LAUNCHED BALLISTIC missile, has been successfully launched by an Air Force B-47 jet bomber.

This experimental air launch was conducted at the Atlantic Missile Range in the vicinity of Cape Canaveral, Fla. It was designed to demonstrate the feasibility of launching a ballistic missile from the air and to test the accuracy of its guidance system by firing it into the vicinity of the orbiting Explorer VI satellite.

Ground-based and airborne special-purpose cameras were used to collect photographic data at the coincidence point for the missile and satellite. Fire flares were released from the 199-B ALBM, at intervals during the flight, to aid the photographic effort.

★ ★ ★

THE ARMY QUARTERMASTER CORPS is buying more than 1000 German Shepherd dogs to be trained for sentry duty at missile sites across the nation.

The dogs must be between one and three years of age; have a shoulder height between a minimum of 23 inches and a maximum of 28 inches; and weigh between 60 and 90 pounds. Dogs of any inconspicuous color (other than white) are acceptable. Males are preferred. Females must be spayed at least 60 days before acceptance.

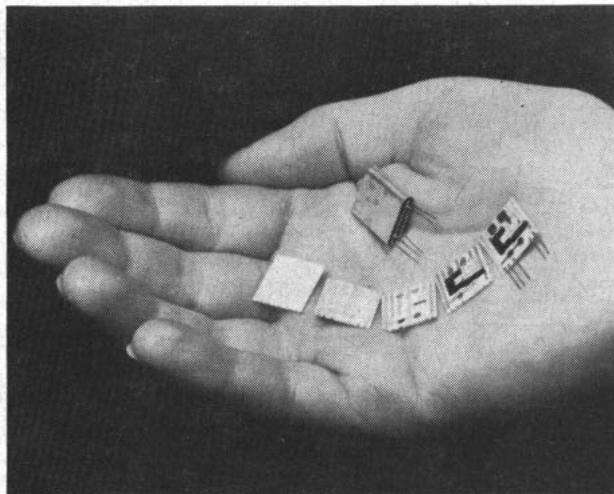
Although registration is not essential, the dogs must be physically and mentally sound, and must have typical German Shepherd characteristics. Alertness, aggressiveness and vigor are necessary qualities. Dogs which are noise- or gun-shy will not be accepted. Prices paid will be based upon the merits of the individual dog.

Anyone interested in selling a qualified animal is urged to contact the Office of The Quartermaster General, Installations Division (Attn: Contracting Officer), Washington 25, D. C., for further information.

★ ★ ★

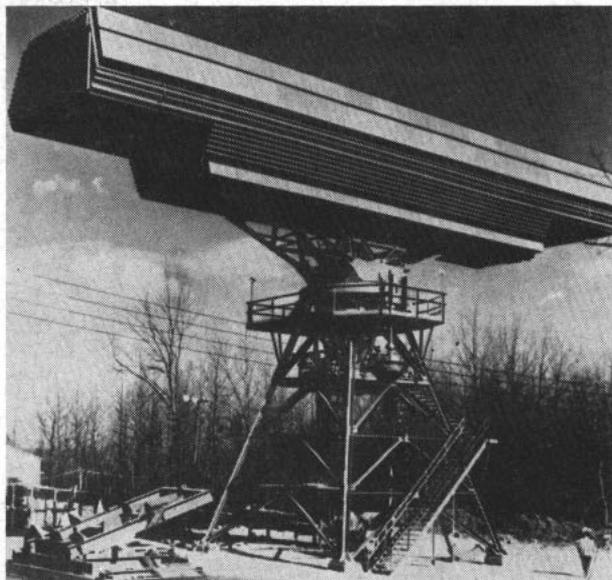
FIVE STRATEGIC AIR COMMAND BASES will have their air defense boosted by five new *Nike-Hercules* missile sites being constructed by the Army.

Scheduled for completion in late 1960 or early 1961, these new air defense sites—part of the Department of Defense's Master Plan for Air Defense—will be



SMALLER—New Army breakthrough in miniaturization produces electronic gear five times smaller than before.

JANUARY 1960



SUPER SENTRY—New Air Force radar antenna weighs more than 50 tons. It's to become part of SAGE defense.

located at Davis-Monthan AFB, Ariz., Minot AFB, Idaho; Malstrom AFB, Mont; and Glasgow AFB, Mont.

★ ★ ★

"SNAKE BATTERIES," strung at intervals on submarine communications cables to boost volume and quality levels, have been developed for the Army Signal Corps.

The flexible zinc-silver chloride batteries, also called "electric eels," are activated when immersed in water. They can easily be wound on wire drums along with the cable.

In use, a battery is placed next to each repeater (the device used to increase the volume of a signal) and spliced into the cable at mile-distance points. The repeaters, which are transistorized, also are flexible and roll easily off the cable drums.

The batteries are flexible because of their segmented construction. Spool-shaped links of silver chloride are separated from zinc segments by rubber rings. A wire which spirals the length of the battery connects the sections.

The basic battery is five-eighths of an inch in diameter and 30 inches long.

★ ★ ★

AN AIR FORCE STAFF SERGEANT made a simulated plunge of 40,000 feet (7.5 miles) in less than a second.

This "fall" took place in the altitude chamber at Mitchell Air Force Base, N. Y. SSGT Richard P. Laauser, USAF, was placed in the chamber and an altitude of 65,000 feet was simulated. Suddenly he was "dropped" 25,000 feet while an electronic brain recorded his reactions.

The electronic doctor measured the sergeant's body temperature, respiration flow, respiration rate, heart beat rate, blood pressure and galvanic skin resistance during his fall.

The electronic doctor was designed to monitor human reactions under severe environmental conditions such as those which the space astronauts will encounter.

45

THE BULLETIN BOARD

This Roundup of State Bonuses May Put You in the Money

NAVYMEN WHO SERVED during the Korean conflict or during World War II may be eligible for one or more of the state bonuses listed in the following roundup.

To apply for a state bonus you will need a copy of your "Notice of Separation from the U. S. Naval Service" (NavPers 553) or "Report of Separation from the Armed Forces" (DD 214) and an application blank provided by the state.

If you are on active duty you may request your commanding officer to certify your service in the appropriate space on the application form by using your service record or other documents available to him. However, if the information cannot be obtained from available records you will have to make a statement under oath and this information will be included in your CO's certification.

No requests for detailed information as to your foreign service or other service data should be requested from the Bureau of Naval Personnel.

To be eligible to make application for a state bonus you will have to obtain proof of your residence. In most cases the home address you gave at the time of your enlistment or entry into service does not constitute complete proof of your legal residence.

Your legal residence will have to be substantiated by such documentary evidence as voting registration, tax data, etc.

Navy veterans who need copies of their separation documents may request them from the commandant of the naval district in which they are currently residing. If you have moved to another naval district since your separation and these documents are not in the possession of the commandant, then, when he receives your request, he will in turn request a certified copy from the district in which your separation papers are permanently retained.

This summary of the state bonuses granted to veterans of World War II, and those with service since 27

David J. Majchrzak, DN, USNR



"Funny, I was about to ask you how to get topside."

Jun 1950, is based on the latest information available. Procedures for making application are outlined below.

Bonuses for Korean Veterans

Illinois

Amount: \$100.

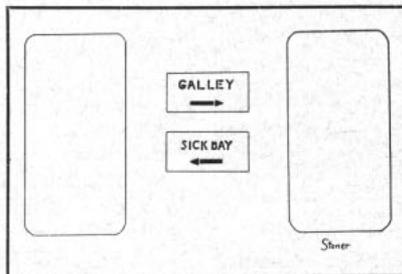
Service: Active duty in the armed forces of the United States on or after 27 Jun 1950 and before 27 Jul 1953. Separation from service under honorable conditions; earned the Korean Service Medal.

Residence: Resident of state of Illinois at least 12 months immediately preceding date of entering service.

Deadline: 1 Jul 1965.

Next of Kin: Eligible survivors of military personnel who died before 1 Jan 1955 of service injuries or disease contracted within the prescribed service period may qualify for a

All Navy Cartoon Contest
Donald Reid Stoner, PN3



\$1000 award. Survivors are recognized in the following order: Widow (or widowers), children, parents, brothers and sisters. A surviving spouse who remarried before 1 Jul 1959 is not eligible to collect a bonus payment.

For applications: Commandant (DCRO), Ninth Naval District, Building 1, Great Lakes, Ill.

Address inquiries to: Illinois Veterans' Commission, State Office Building, 401 South Spring Street, Springfield, Ill.

Iowa

Amount: \$10 per month for domestic service; \$12.50 per month for foreign service; \$500 maximum.

Service: Active duty in the armed forces of the United States between 27 Jun 1950 and 27 Jul 1953. Separation from service under honorable conditions. Persons still in service or retired from active service may apply. Minimum of 120 days' service before 25 Nov 1953 required.

Residence: Resident of state of Iowa at least six months immediately preceding date of entering service.

Deadline: 31 Dec 1960.

Next of Kin: If veteran died of service-connected causes between applicable periods of service, \$500 maximum, regardless of length of service. Eligible survivors include the unmarried spouse, children, parents.

For applications: Commandant (DCRO), Ninth Naval District, Building 1, Great Lakes, Ill.

Address inquiries to: Service Compensation Board, State House, Des Moines, Iowa.

Massachusetts

Amount: \$300 for any foreign service. \$200 for more than six months' active service in the United States. \$100 for 90 days of state-side service.

Service: Minimum of 90 days' service between 25 Jun 1950 and 31 Jan 1955, inclusive.

Residence: Six months immediately before entry in military or naval service. Such residence status is proved by certification of assessor

at city or town in which applicant lived when he entered active service.

Deadline: None.

Next of Kin: If veteran died in service, \$300 to eligible survivor, otherwise, only the amount he would receive if alive.

Active duty personnel: Personnel who have been discharged and have reenlisted after 25 Jun 1950, and are serving regular enlistment contracts may apply. Three years on active duty after 25 Jun 1950 are required for indefinite enlistees and commissioned officers. A photostat of the "Report of Separation from the Armed Forces of the United States" (DD Form 214) must be filed with the application.

Information: Benefits have been established by the Massachusetts State Legislature to commissioned officers, warrant officers or indefinite enlistees who have served at least three years on active duty from 25 Jun 1950 and who have not yet been discharged or released under honorable conditions. Applicants must attach to application form a statement from commanding officer verifying period of service.

For applications: Commandant (DCRO), First Naval District, 495 Sumner Street, Boston 10, Mass.

Address inquiries to: Veterans' Bonus Commission, 15 Ashburton Place, Boston 8, Mass.

Montana

Amount: \$10 per month for state-side or foreign service exclusive of the Korean theater. \$15 per month for service in the Korean theater. Prisoners of war may qualify for a minimum of \$300 or a maximum of \$600.

Service: Active military service between 25 Jun 1950 and 16 Oct 1953, inclusive.

Residence: Resident of the state of Montana at time of entering service.

Deadline: 28 Jul 1961.

Next of Kin: If veteran died in active service, eligible survivors may collect \$500. Eligible survivors include: Unremarried widow, children or parents.

For applications: Commandant (DCRO), Thirteenth Naval District, Seattle 15, Wash.

Address inquiries to: Adjusted Compensation Division, P. O. Box 612, Helena, Mont.

New Hampshire

Amount: \$10 per month for service up to \$100 maximum.

Service: A minimum of 90 days between 25 Jun 1950 and 27 Jul 1953.

Residence: One year pre-service residency.

Deadline: 31 Dec 1960.

Next of kin: Survivors of deceased servicemen are eligible for the \$100 maximum. Next of kin recognized in the following order: Spouse, children, parents.

For applications: Commandant (DCRO), First Naval District, 495 Sumner St., Boston 10, Mass.

Address inquiries to: Adjutant General of New Hampshire, State Military Reservation, Concord, N. H.

North Dakota

Amount: \$12.50 per month for domestic service. \$17.50 per month for foreign service.

Service: Active service in the armed forces of the United States for more than 60 days between 25 Jun 1950 and 27 Jul 1953. Separation from service under honorable conditions. Persons still in service must furnish evidence that such service was honorable.

Residence: Resident of state of North Dakota at time of entering service and for six months before that time.

Deadline: 15 Feb 1960.

Next of kin: Same amount as for veteran if living but in no case less than \$600.

For applications: Commandant (DCRO), Ninth Naval District, Building 1, Great Lakes, Ill.

Address inquiries to: The State Adjutant General, Bismarck, N. D.

Pennsylvania

Amount: \$10 per month for domestic service. \$15 per month for

WAY BACK WHEN

Navy's George Washingtons

USS *George Washington*, SSB(N) 598, launched on 9 Jun 1959, is the third naval ship named for that famous American. This latest ship was launched little more than 161 years after the Navy acquired its first USS *George Washington*.

That 32-gun ship, which was purchased by the Navy in 1798, could fire 264 pounds of non-explosive shot in one volley.

During her short career there was a certain amount of humiliation for the ship. On one occasion, the Dey of Algiers forced her to carry his emissaries and gifts to the Grand Seignior of Constantinople.

And at least once the 624-ton ship carried American tribute to the Dey to buy the safety of American flag ships. It was events such as these that led to the

rallying cry "Millions for defense but not one cent for tribute." Later, Stephen Decatur's successful struggle against these same Mediterranean pirates helped to establish freedom of the seas.

In 1802 *George Washington* was sold. Some 119 years later, in 1908, Germany built a ship named *Washington* and used her on the trans-Atlantic run. In 1917 it was seized by the United States and used through World War I as a troop transport.

In 1918, that ship carried President Woodrow Wilson to France for the Versailles Peace Conference. That marked the first trip to Europe by a U. S. chief executive.

Washington made a second voyage abroad with the President in 1919. Between these trips, she ferried soldiers home from European battlefields.

Later, *George Washington* was decommissioned, but only to be recalled for World War II service as USS *Catlin* (AP 19). Following the war the ship was placed in the maritime Reserve Fleet at Hawkins Point, Baltimore, Md., until it was sold for scrap in 1951.

The latest *George Washington* bears no resemblance to its two predecessors. The 5400-ton Fleet ballistic missile submarine will be driven by a nuclear reactor which needs only occasional refueling, and it will be able to remain at sea almost indefinitely as a hidden, mobile missile launcher.



holders of the Korean Service Medal, awarded for duty in the Korean theater. \$500 maximum.

Service: Active service in the armed forces of the United States for more than 60 days between 25 Jun 1950 and 27 Jul 1953 and separation from service under honorable conditions. Note: When the above qualifications are met, payments will be made for service up to 27 Jan 1954.

Personnel who served on continuous active duty in the armed forces for four years before 25 Jun 1950 will not be eligible to receive the bonus on the basis of such service unless they are holders of the Korean Service Medal and were residents of Pennsylvania not only when they entered service but also on 8 Jul 1957, the day the bonus act was enacted.

Residence: Resident of state of Pennsylvania at time of entering service.

Deadline: 31 Dec 1963.

Next of kin: Survivors of a veteran who died in active service during the period 25 Jun 1950 and 27 Jul 1953, are eligible for the \$500 maximum payment.

For applications: Korean Conflict Veterans' Compensation Bureau, Department of Military Affairs, Commonwealth of Pennsylvania, Harrisburg, Pa.

Note: Original copies of "Report of Separation" (Form DD 214) should not be submitted with application because they will not be returned. If you had your separation papers recorded by a county Recorder of Deeds you may apply to that office for a certified copy. If the original document is in your possession you may now have it recorded and apply for a duly certified copy. If you entered the armed forces from Pennsylvania you may

All Navy Cartoon Contest
David J. Majchrzak, DN, USNR



"Pass the salt, please."

obtain certified copies of your discharge papers from the state Selective Service Headquarters, Box 92, Harrisburg, Pa. In requesting a certified copy, you should give your name, address, selective service number and home address at the time you registered for the draft.

Vermont

Amount: \$10 per month not exceeding a total of 12 months. \$120 maximum.

Service: Honorable discharge from an enlisted status between 27 Jun 1950 and 31 Jan 1955.

Residence: One year immediately before entering service.

Deadline: None.

Next of kin: \$120 will be paid to the next of kin of veterans who died from service-connected causes. Next of kin in order are: widow or widower, remarriage does not bar entitlement; next of kin who are lineal heirs; and parents.

Amount veteran was entitled to by length of service will be paid to the next of kin, in order named above, of any veteran who has died from nonservice-connected causes.

For applications: Commandant (DCRO), First Naval District, 495 Sumner Street, Boston 10, Mass.

Address inquiries to: Office of the Adjutant General, State Office Building, Montpelier, Vt.

World War II State Bonuses

The states listed below are still accepting applications for bonus payments from World War II veterans until the designated deadline:

Massachusetts

Amount: \$100 for domestic service of less than six months. \$200 for domestic service of more than six months. \$300 for overseas service.

Service: Service between 16 Sep 1940 and 31 Dec 1946, both dates inclusive. Discharge or release other than dishonorable, or in active service.

Residence: Six months immediately before entering service.

Deadline: None.

Next of kin: Survivors of persons who died in service before 31 Dec 1946 may receive \$300. Otherwise, amount veteran would receive if alive.

For applications: Commandant (DCRO), First Naval District, 495 Sumner Street, Boston 10, Mass.

Address inquiries to: Veterans' Bonus Commission, 15 Ashburton Place, Boston 8, Mass.

New York

Amount: \$50 for 60 days or less of domestic service. \$150 for more than 60 days of domestic service. \$250 for any foreign service.

Service: Active duty between 7 Dec 1941 and 2 Sep 1945, both dates inclusive. Discharge under honorable conditions or still in service.

Residence: Six months immediately before service. Residence at time of application requirement removed in November 1949 election.

Deadline: None.

Next of kin: If death occurred in service, next of kin may receive \$250. Otherwise, amount veteran would receive if alive.

For applications: Commandant (DCRO), Third Naval District, 90 Church Street, New York 7, N. Y.

Address inquiries to: Veterans' Bonus Bureau, Department of Taxation and Finance, 1875 North Broadway, Albany 4, N. Y.

Vermont

Amount: \$10 per month (enlisted personnel only). \$120 maximum.

Service: Active service between 11 Sep 1941 and 30 Jun 1947, inclusive. Honorable separation.

Residence: Resident at time of entry and for one year immediately prior.

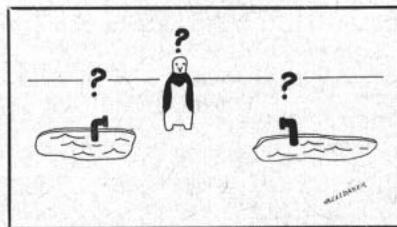
Deadline: None.

Next of kin: Survivors of persons dying in service may receive \$120. Otherwise, amount veteran would receive if alive. Remarriage does not bar widow's entitlement.

For applications: Commandant (DCRO), First Naval District, 495 Sumner Street, Boston 10, Mass.

Address inquiries to: Office of the Adjutant General, State Office Building, Montpelier, Vt.

All Navy Cartoon Contest
W. F. Hazelbaker, TE/RMC, USN



Applications Being Considered For Transfer to Supply And Civil Engineer Corps

Applications for transfer to the Supply and Civil Engineer Corps are now being sought from certain eligible line officers of the Regular Navy.

For Supply Corps transfers the deadline on submission of applications is 1 Feb 1960. For the Civil Engineer Corps the deadline is 1 Apr 1960. Applications should be forwarded, via commanding officers, so as to reach the Chief of Naval Personnel by these dates. The following rundowns will give you an idea of requirements, procedures and the like for such transfers.

Supply Corps

This opportunity is available to a limited number of permanently commissioned line officers of the Regular Navy. Those selected will be ordered to the Navy Supply Corps School at Athens, Ga., for six months' instruction in basic Supply Corps duties. Throughout their careers as Supply Corps officers, they will find their line training and background useful and valuable in handling many of their duties in military business administration.

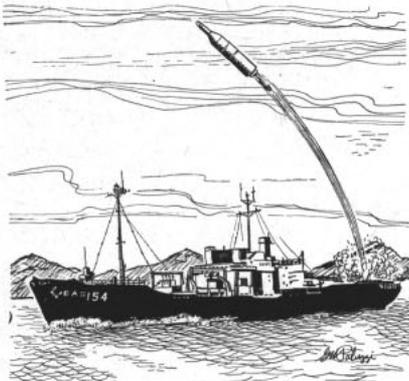
Male line officers—lieutenant and below—of the Regular Navy with a date of rank of 7 Jul 1957 and junior to lineal number 41522-00 are eligible. (Article C-1105 of the *BuPers Manual* is modified accordingly.) They must have completed at least one year of duty afloat as of 1 Feb 1960—and waivers of this requirement will not be granted.

Limited duty officers are not eligible for transfer. However, Article C-1317 of the *BuPers Manual* provides means by which they may apply for reclassification. Permanently commissioned warrant officers, regardless of their temporary rank, are not eligible.

There are special circumstances to be considered by those officers who were commissioned in the U. S. Navy from NROTC units. If you are in that category, and are selected for transfer, you will be issued a new appointment in the Supply Corps. In the process you will acquire a permanent status as a commissioned officer of the Regular Navy, which means you will no longer be subject

HOW DID IT START

Observation Island Has Polaris Too



USS *Observation Island* (EAG 154), commissioned on 5 Dec 1958, was converted from a cargo-type merchant ship. The conversion took 13 months.

Besides the Polaris missile-launcher which it carries aboard, this ship also carries navigation equipment similar to that which is installed in the new FBM submarines.

Outwardly there were several changes made to the ship. Forward of the superstructure is a navigational tower on which is mounted star trackers, or what might be described as miniature observatories.

These instruments are so sensitive that when pointed toward certain stars or

planets, the trackers automatically follow the bodies and give continuous celestial information for determining exact position.

The hull and engines of the ship, for the most part, were not changed. About the only addition was a roll stabilization system. The most conspicuous features resemble large fins and are used to counteract the ship's roll while underway. The *Polaris*-launching platform should be stable when the missile is fired.

Changes were made to the superstructure and hold to make room for the new navigational, fire control, launching and instrumentation system. With the addition of data acquisition equipment, *Observation Island* is a complete sea-going missile range. Extensive workshops are also installed to support the weapon system.

Here are *Observation Island's* vital statistics: length (over all)—563 feet; beam—76 feet; draft—24 feet; displacement (full load)—16,100 tons; shaft horsepower—17,500 (designed); speed—20 knots.

Two other U. S. Navy ships before *Observation Island* have been used as floating missile test launchers. They have been USS *Norton Sound* (AVM 1), which tested the *Viking* rocket, and the converted battleship USS *Mississippi* (AG 128), which tested the *Terrier* missile.

to selection for retention at the end of three years of commissioned service. Therefore, you must include the following statement in your application as a separate paragraph:

"I understand that if I am selected for transfer to the Supply Corps that I shall be tendered a new commission and a new appointment in the Supply Corps and therefore will acquire a permanent status as a commissioned officer of the Regular Navy and will no longer be subject to selection for retention at the end of three years of commissioned service. Further, I understand that acceptance of my commission and appointment in the Supply Corps precludes my option of requesting release to inactive duty at the termination of three years of commissioned service."

Some Naval Academy graduates whose line commissions might be revoked for physical reasons could be eligible for transfer to the Supply Corps. If such is the case with you, and you are motivated toward a career in military business manage-

ment, you should submit a Report of Medical Examination (Standard Form 88), in duplicate, and a Report of Medical History (Standard Form 89), with your application.

Each applicant is to include, in a separate paragraph of his application, a statement to the effect that he will not resign or request release from active duty during the curriculum, if he is selected for transfer to the Supply Corps and assigned to the Navy Supply Corps School. He must also agree to serve on active duty for at least one year after completing the course. (This will not reduce any period of obligated service incurred upon commissioning or at any subsequent time.)

Applications for transfer to the Supply Corps should be forwarded—via commanding officer—to the Chief of Naval Personnel (Attn: Pers B136) in time to reach the Bureau by 1 Feb 1960. The endorsement by your CO (or officer-in-charge) should include an evaluation of your professional qualifications and performance and a recommendation as

to your suitability for duty in the Supply Corps.

The Chief of Naval Personnel will acknowledge applications and retain them on file for consideration by a selection board which will convene on or about 25 Feb 1960. Applicants will be informed of the board's action as soon as possible after the board has adjourned.

BuPers Notice 1210, of 21 Oct 1959, is the directive covering line officer transfers to the Supply Corps.

Civil Engineer Corps

To be eligible for a CEC transfer, you must be a line officer junior to lineal number 55891-00, as per the "Register of Commissioned and Warrant Officers of the U. S. Navy and Marine Corps and Reserve Officers on active duty as of 1 January 1959." You must also have completed at least one year of active duty by 1 Apr 1960. (Waivers of this requirement will not be granted.)

In addition, you should possess a bachelor's degree—in one of the fields listed below—from a college or university accredited by the Engineers' Council for Professional Development, Committee on Engineering Schools (as listed in the Department of Health, Education and Welfare bulletin entitled *Accredited Higher Institutions*):

- Architecture or Architectural Engineering.
- Civil Engineering.
- Electrical Engineering.
- Mechanical Engineering.
- Mining Engineering.
- Petroleum Engineering.

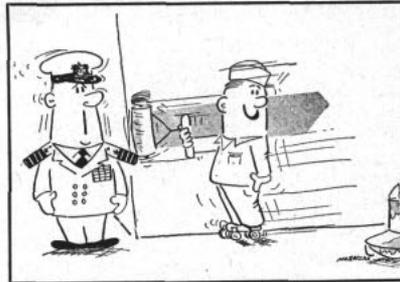
Those who hold baccalaureates in other fields of engineering will be considered on an individual basis to determine their eligibility for transfer to the Civil Engineer Corps.

The special circumstances which apply to Supply Corps transferees who were commissioned in the U. S. Navy from NROTC Units also apply to CEC transferees. Therefore, a statement similar to the one quoted in the Supply Corps section of this article must be included as a separate paragraph in applications from these officers.

Applications should be in letter form. They must be forwarded to the Chief of Naval Personnel (Attn: Pers B136), via commanding officers, in time to reach the Bureau by 1 Apr 1960.

The Chief of Naval Personnel will

David J. Majchrzak, DN, USNR



"Whееее ! !"

acknowledge applications and retain them on file for consideration by a selection board which will convene on or about 15 Apr 1960. As soon as possible after the board has adjourned, applicants will be informed of the board's decision on their cases.

Line-to-CEC transfers are discussed in BuPers Notice 1210, of 19 Oct 1959.

First Sea Launching Of Navy's Polaris

A *Polaris* test vehicle was successfully fired late last summer from *uss Observation Island* (AG 154) off Cape Canaveral in the Atlantic Missile Range.

Performance was satisfactory and all test objectives appeared to have been reached in this first *Polaris* launching from a ship at sea.

The 28-foot missile was fired from a compressed air tube below deck. As the countdown reached zero, compressed air popped the *Polaris* out of the tube and, when the missile reached an altitude of about 70 feet, its first-stage engine ignited.

Spurting a tail of white smoke, the missile curved high in the sky and sped down range 700 miles to fulfill this test vehicle's programmed range. A bright flash of fire shortly after launching disclosed ignition of the second stage.

Compression chambers similar to the one used aboard *Observation Island* will launch *Polaris* from submarines. These chambers, similar to torpedo-launching tubes, will enable a built-in firing mechanism to trigger the first-stage engine above water.

List of New Motion Pictures Scheduled for Distribution To Ships and Overseas Bases

The latest list of 16-mm. feature movies available from the Navy Motion Picture Service, Bldg. 311, Naval Base, Brooklyn 1, N. Y., is published here for the convenience of ships and overseas bases. The title of each picture is followed by the program number.

Those in color are designated by (C) and those in wide-screen processes by (WS). Distribution began in November. For other movies available, see earlier issues of ALL HANDS.

These films are leased from the movie industry and distributed free to ships and most overseas activities under the Fleet Motion Picture Plan.

For the First Time (1403) (WS) (C): Musical; Mario Lanza, Johann Van Koziar.

Island Woman (1404): Melodrama; Marie Windsor.

The Rebel Set (1405): Melodrama; Gregg Palmer, Kathleen Crowley.

The Five Pennies (1406): Musical; Barbara Bel Geddes, Danny Kaye.

Say One For Me (1407) (WS) (C): Musical; Bing Crosby, Debbie Reynolds.

Middle Of The Night (1408): Drama; Frederic March, Kim Novak.

Face Of Fire (1409): Melodrama; Cameron Mitchell, James Whitmore.

The Last Train From Gun Hill (1410) (C): Western; Kirk Douglas, Anthony Quinn.

Anatomy Of A Murder (1411): Drama; James Stewart, Lee Remick.

Holiday For Lovers (1412) (WS) (C): Comedy-Drama; Clifton Webb, Jane Wyman.

Hercules (1413) (WS) (C): Drama; Steve Reeves, Sylvia Koscina.

The Bat (1414): Melodrama; Vincent Price, Agnes Moorehead.

North by Northwest (1415) (C): Drama; Cary Grant, Eva Marie Saint.

Blue Denim (1416) (WS): Drama; Carol Lynley, Brandon DeWilde.

The Big Operator (1417) (WS): Melodrama; Mickey Rooney, Steve Cochran.

Battle Of The Coral Sea (1418): Drama; Cliff Robertson, Gia Scala.

Report on Living Conditions on Okinawa for Navy Families

RECEIVED ORDERS for Okinawa? Here's the scoop on duty at the station—according to those who should know best—the people who have lived there:

Okinawa is approximately 6500 miles from San Francisco and 830 miles southwest of Tokyo. It is the largest and most important of the more than 100 islands of the Ryukyu Archipelago, which stretches from southern Japan to Formosa.

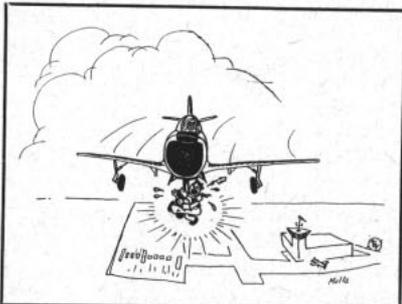
The island is 65 miles long, and from two to 12 miles wide, with almost impenetrable mountains in the north, and coral reefs and rich farm lands in the south.

Most of the people prefer to wear western dress, though a few traditional kimonos may be seen from time to time. Naha, the capital city of Okinawa, is about as western a city as can be found in Asia. Naha's streets feature shops with English signs, English-speaking clerks, and many American cars.

Because of Okinawa's location in the China Sea, the island is the target of passing typhoons. Each year, three or four typhoons do some damage. Winds of over 100 miles per hour are not unusual during one of these storms. Damage by typhoons is small, however, because of the modern tracking and warning systems maintained on the island. Houses are largely typhoon-proof, but power and telephone lines are not.

Owing to the influence of the Japanese current, Okinawa has a sub-tropical maritime climate, comparable to Palm Beach. Extreme temperatures are rare, and summer rarely sees temperatures over 90 degrees.

All Navy Cartoon Contest
A. J. Malta, SN, USN



"That doggone mechanic! The wheels still stick in the down position!"

This, however, coupled with the high relative humidity, can cause discomfort. During the winter months, there is a damp chill in the air, again caused by the humidity, which makes winter clothing welcome.

Housing: The Navy on Okinawa has housing on base, and in six off-base areas varying from three to 18 miles from Naha. There are 275 houses currently assigned to Navy dependents. These consist of two- and three-bedroom quonsets and concrete block houses.

Quonsets on the base have been classified as sub-standard and rent for either \$36.00 or \$45.00. All other government housing is paid for by the disbursing officer, utilizing BAQ. At present the waiting period for government housing is six to eight months.

All eligible naval personnel are assigned housing on "The date departed the U. S." basis. No housing is assigned specific units with the exception of the MOQ on the Naval Air Facility and the Admiral's Quarters. All others, regardless of unit or rank, are placed on one list and offered housing when they reach the head of the list. Those who take advantage of the limited private rentals retain their place on the list and may elect to take government quarters or remain in private rental. If Navy housing is desired they must inform the Housing Officer, or persons below them on the list will be offered the housing. No hotel accommodations for dependents are available.

Bachelor officers occupy small three- or four-bedroom BOQs. A service fee of \$8.00 per month covers all laundry, house cleaning and maid service.

Enlisted personnel with no dependents on board are billeted in either quonset huts or concrete barracks.

Household Equipment: These items are furnished in government housing:

Electric range	Dining table
Refrigerator	Dining chairs
Sectional divan	Beds
Mattresses and spring	Table lamps
Chests of drawers	Floor lamps
End tables	Coffee tables
Lounge chairs	Buffets
Occasional chairs	Vanity — dressers

Refrigerators vary in size from six to 12 cubic feet and there is no guarantee as to the size assigned. Some people prefer to bring their own refrigerator to be assured of enough cooler space.

Beds may be either twin or double size, depending on the housing assigned.

These items are *not* furnished:

Electric appliances	Freezers
Radios	Linens
Television	Draperies
Clocks	Washing machines
Baby furniture	Dryers
Rugs	Kitchen utensils
Dishes and glassware	Silverware

Fiber rugs are very cheap and practicable and are purchased through the Base Exchange.

All cooking is done with electricity. There is no gas, either natural or bottled, on Okinawa. Electricity is 110V-60 cycle and all stateside appliances may be used.

Transportation: The newer cars will suffer from humidity and salt spray, and the speed limit for the island is 30 mph maximum—a speed not recommended for high compression engines. Consequently, while a car comes in very handy, Okinawa is one place where an old Ford fares better than a new Cadillac. If a new car is brought over, both an undercoat and a wax job are essential. The tires take a beating from the coral on the island; new treads are recommended. A retreading firm on the island can take care of such matters. Exchange service stations provide all necessary services and

All Navy Cartoon Contest
Alfred B. Castro, SA, USN



"How many times have I told you to let me handle the difficult jobs?" Now, hand me those wires!"

local garages provide satisfactory repair services.

Schools: Schools are available for all grades. An elementary school and an excellent high school are located on the island, for all dependent children. Transportation to and from schools is furnished.

Clothing: The winter uniform is worn approximately three months out of a year, therefore, bring both summer and winter uniforms. Off duty, civilian clothes may be worn. Temperature and humidity make clothing hard to care for and have made Okinawa a pretty casual station in this respect. For women, summer clothing of cotton, light silk, rayon, nylon and linen is desirable most of the year, as mentioned above. It is suggested that you take a complete wardrobe for each member of your family. Make certain you have plenty of shoes, lingerie, children's sports clothing and all clothing and toilet items for infants. "Washable" is the keynote for Okinawan clothing. Dry cleaners on the island are not equipped to handle delicate materials.

Women wear hats occasionally, but kerchiefs are popular headgear. Furs and leather items such as luggage are very vulnerable to the damp climate. Many find it to their liking, and also cheaper, to purchase material, of which there is an excellent stock, and have clothing made by the local tailors or dress-makers. However, ready-made clothing is available at the PX, and at local stores.

Pets: It is recommended that pets be left at home. However, if you decide to bring a pet, the only formal entry requirements are complete immunization and a restriction of two pets per family. If a dog is older than two months he must have a rabies shot certificate. Shots can be administered by the base veterinarian. A small fee for the shot includes the license. No quarantine period is imposed upon arrival of pets except the time required for examination and checking the vaccination record. Canned dogfood is stocked at Base Exchanges.

Immunizations: The following are needed before embarkation:

Smallpox — Vaccination or revaccination within one year.

Typhoid; Paratyphoid — Basic

David J. Majchrzak, DN, USNR



"I am the ship's barber."

series or booster within one year.

Tetanus—Basic series or booster within four years.

Cholera—Basic series or booster within six months for children under six months only. D. P. T. immunizations are required. Routine shots are required from the age of six months or older.

Poliomyelitis—Immunization must be administered to all persons less than 40 years old, traveling to overseas areas, who have not had basic series. If one year has elapsed since the completion of the basic series, one reimmunization is required. At least the first dose will be administered before beginning travel. Additional required doses not administered before travel will be given in overseas areas. Those more than 40 years old may be vaccinated on a voluntary basis.

Check with authorities ahead of time for other inoculations.

Passports: Passports are required for dependents. Upon receipt, at Com 12 headquarters, of the appli-

David J. Majchrzak, DN, USNR



"That new ship's barber won't last long."

cation for transportation overseas, pertinent information will be forwarded concerning passports and other helpful information.

Disbursing and Financial: The Disbursing Office is located in the NAF supply building. All financial transactions on or off base are conducted with United States currency.

If travel pay was drawn before reporting to Okinawa, it is best to check with the Disbursing Office as soon as possible to fill out a travel itinerary. Travel claims take a while to process, but this will insure that your pay check is not affected.

Complete banking facilities are offered on the base. In addition to checking and savings accounts, there is a complete travel service, including tickets, shipping and other assistance. American Express is set up to telegraph flowers, cable money, sell travelers checks, cash checks and issue auto and home insurance. Officers and Petty Officers may have their pay deposited into checking and savings accounts maintained here.

Medical and Dental Care: The Naval Air Facility maintains an efficient dispensary for those needing medical assistance at any time of the day or night.

The NAF dental dispensary is equipped with the most modern equipment on the island. Except for emergencies, sick call hours are for making dental appointments and examinations. No orthodontic work is done.

Religion: Catholic, Protestant and Jewish religious services are provided for the Navy family.

Post Office: NAF has its own post office which is authorized to sell stamps, money orders and receive and dispatch all classes of mail.

The average transit time for air mail and air parcel post to the States is seven days. Ordinary mail, parcel post and newspapers are usually received in from five to six weeks. Geographic location of your unit should never be used with the FPO address. Mailing addresses for the different naval units vary.

Small Stores: A complete line of enlisted clothing and a limited stock of officers' summer wear items is maintained.

There is some difficulty in obtaining officers' uniforms on Okinawa.

Fine uniforms, at very reasonable prices, may be purchased in Hong Kong or Japan.

Base Exchange: The Ryukyus Central Exchanges offer a wide selection of both necessary and luxury items at reasonable prices. Jewelry, cameras, radios, phonographs, hardware, toilet items, magazines, records and many other items are kept in stock. A wide selection of gift items from Japan, Thailand, Italy, Germany and England is featured. The Exchanges are open six days a week.

Commissary: Four military commissaries offer a selection of food stuffs comparable to that found in larger stateside supermarkets. Meats, fresh fruit, and vegetables and locally produced baked items are featured in addition to a complete line of name brand canned foods.

Dependents, bachelor officers and civilians as well as chiefs on separate rations are authorized purchasers. Each buyer, however, must have a permit, obtained at the Commissary Office.

Recreation: In addition to facilities offered by the Naval Air Facility itself, naval personnel are encouraged to participate in all Air Force activities on Naha Air Base. Recreation facilities include motion picture theatres, clubs, a six-lane bowling alley, a golf course and driving range, and several hobby shops. Football, softball, judo and swimming, on the intramural and inter-command levels, are part of the recreational program.

Many Americans turn to deep-sea fishing on Okinawa. As for hunting, there are ducks, doves and some tiny quail.

One of the most popular hobbies on the island is photography. The scenery furnishes a wide variety of subjects — beaches, rugged hills, primitive villages, terraced rice paddies and checkerboard gardens on the hillsides.

Beaches and Rest Centers: Okinawa has some of the most beautiful beaches in the Pacific. The water is warm, crystal clear and alive with countless varieties of tropical fish.

Yaka is the site of the enlisted men's rest center, north of Ishikawa beach, on the west side of the island. The rest camp offers enlisted personnel and their families a complete line of recreational facilities for a few days of leave or a weekend.

Okuma is the site of the officers' rest center, and is located on the East China Sea side of Okinawa, about 50 miles north of Sukiran. Beautiful beaches, good meals, a variety of recreational equipment, and boats make this an ideal place for vacations. Reservations may be required, especially for family groups.

Beaches: At present, Ishikawa, Yaka and Okima are the only approved swimming beaches for general use of armed forces personnel. Other beaches may be used for picnics and wading. Skin divers must conform to current safety regula-

NOW HERE'S THIS

Answer Box

"Good afternoon. This is a recorded announcement of ships' movements of Submarine Squadron 12 for January 29th."

Thus begins a one-minute telephone recording which has become quite a hit with SubRon 12 dependents—and with telephone operators at the Naval Base, Key West, Fla.

The announcement comes from a little grey "answer box" installed in the Squadron's Operations Office to take care of phone calls from dependents of squadron members. Thanks to this device, the wife of a SubRon 12 Navyman can now find out when and where to meet her husband's ship as easily as she can dial the local weather report.

Kept up-to-date by the Operations Office, the gadget gives firm and approximate arrival times, tells where ships will be berthed, and also furnishes information on ships out of Key West on overnight and unclassified operations, together with their dates of return.

Paid for by the Squadron's recreation fund, the Silent Service's answering service has proved such a success that other naval activities in the Key West area are now having similar devices installed.



tions, details of which are available at the Personnel Office.

Island Transportation: Okinawa has a lot to offer the sightseer, and one of the native busses is the best way to get an informal tour of the country. However, if you have anywhere definite to go, or any specific time set to be there—take a taxi. Not only are the busses marked in Japanese, but few, if any, of the drivers feel obligated to follow a definite route to a definite point. They occasionally drive as the spirit moves them. It's fun, but uncertain.

Restaurants: During your stay on Okinawa, bear this in mind: Not all eating places or bars are approved for military personnel. This applies both to food and drinks as well as surroundings.

Adult Education: There are considerable opportunities for educational advancement at the Naval Air Facility. The Education Officer is located in Bldg. #163 and is ready to offer assistance in your efforts to better yourself whether it be through Navy Correspondence Courses and Navy Training Courses, (through advancement in rate), USAFI courses, college and university courses either by correspondence or by actual attendance at locally established classes (as offered by the University of Maryland at present) or by correspondence with stateside Departments of Education.

Library: An excellent library is available for all personnel at the Naha Air Base or the Naval Air Facility. The library is open daily from 0900 to 2200.

Ironsides Sails Again

"Old Ironsides" (uss *Constitution*), with her war-tattered ensign streaming from the peak of the mizzenmast gaff, got underway recently at Charlestown, Mass.

It was the annual voyage for the old frigate and it took her about one nautical mile from her berth at the Boston Naval Shipyard in Charlestown, Mass. The short voyage is accomplished annually with the help of tugs which turn the wooden ship around to prevent the masts and yardarms from being warped by prevailing winds and sun.

After about two hours, the 165-year-old warship was back in the berth where she was again readied for visitors, about 400,000 a year.

It's That Time Again — Here's How the Last Exams Turned Out

ABOUT 46,000 enlisted persons were advanced in rate last month as a result of the August 1959 Navy-wide examinations. In February, examinations will again be given. POs will also compete this time as they try for the hat.

To give you some idea of how the picture looks in your particular rating, here is a list of the actual num-

bers that were promoted in each rating in December. Emergency service ratings not listed are included with the corresponding general service ratings. "All" indicates that all who passed the examination were advanced. The dash (—) indicates there were no exams in the rating.

The following table will give you the scores:

Rating Passed Advanced Passed Advanced Passed Advanced

GROUP I (Deck)	E-4		E-5		E-6	
BM	1494	400	1187	100	1108	100
QM	373	All	137	All	117	All
RD	904	All	499	All	68	All
SM	449	All	180	All	51	All
SO	—	—	—	—	46	All
SOA	38	All	38	All	—	—
SOG	327	All	181	All	—	—
SOS	56	All	26	All	—	—
SOO	45	All	—	—	—	—
GROUP II (Ordnance)						
FT	—	—	329	All	154	73
FTA	428	All	—	—	—	—
FTE	1	All	—	—	—	—
FTG	10	All	—	—	—	—
FTL	119	All	—	—	—	—
FTM	342	All	—	—	—	—
FTU	25	All	—	—	—	—
GM	924	500	577	100	606	100
GS	145	All	43	All	43	25
MN	31	All	58	27	55	4
NW	115	All	31	All	29	All
TM	283	All	135	All	164	114
GROUP III (Electronics)						
ET	—	—	491	All	103	All
ETN	484	All	—	—	—	—
ETR	437	All	—	—	—	—
ETS	23	All	—	—	—	—
GROUP IV (Precision Equipment)						
IM	40	20	21	16	12	2
OM	30	All	10	All	6	All
GROUP V (Admin. and Clerical)						
CT	513	500	317	All	75	57
CS	953	390	896	100	565	50
DK	277	All	119	All	110	20
JO	102	All	24	All	7	All
MA	141	All	74	All	36	18
PN	803	All	362	310	251	110
RM	1343	All	593	All	158	All
SH	746	190	457	20	329	10
SK	961	All	547	All	361	223
TE(RM)	—	—	13	All	21	All
TE(YN)	—	—	—	—	12	4
YN	1415	All	816	470	653	200
GROUP VI (Misc.)						
DM	142	100	47	All	6	All
LI	75	50	25	6	30	3
MU	81	All	76	All	21	All

Rating Passed Advanced Passed Advanced Passed Advanced

GROUP VII (Engineering & Hull)	E-4		E-5		E-6	
BR	—	—	—	—	7	All
BT	1173	All	543	All	165	143
DC	315	245	197	50	241	10
EM	1285	All	817	All	190	All
EN	1078	All	728	All	605	425
IC	581	All	311	All	35	All
ML	12	All	13	4	10	1
MM	1694	All	740	All	189	All
MR	282	All	148	All	28	All
PM	20	18	12	All	2	All
SF	—	—	—	—	316	135
SFM	315	All	221	All	—	—
SFP	348	All	180	All	—	—
GROUP VIII (Construction)						
BU	—	—	—	—	32	All
BUH	17	All	10	All	—	—
BUL	167	All	57	All	—	—
BUR	53	All	26	All	—	—
CE	—	—	—	—	16	All
CEP	33	All	16	All	—	—
CES	14	All	4	All	—	—
CET	25	All	10	All	—	—
CEW	41	All	25	All	—	—
CM	—	—	—	—	48	10
CMA	75	All	42	20	—	—
CMH	32	All	21	12	—	—
EO	—	—	—	—	119	12
EOH	115	100	67	21	—	—
EON	113	57	82	10	—	—
SV	23	All	10	All	2	All
SW	—	—	—	—	22	12
SWE	27	All	10	All	—	—
SWF	21	All	18	All	—	—
UT	—	—	—	—	22	14
UTA	17	All	7	All	—	—
UTB	20	All	3	All	—	—
UTP	61	All	30	All	—	—
UTW	9	All	6	All	—	—
GROUP IX (Aviation)						
AB	—	—	172	125	156	74
ABG	159	95	—	—	—	—
ABU	326	285	—	—	—	—
AC	—	—	—	—	99	62
ACR	11	All	27	20	—	—
ACT	169	All	137	90	—	—
ACW	176	All	117	80	—	—
AD	—	—	1360	400	1132	150
ADJ	604	All	—	—	—	—
ADR	608	All	—	—	—	—
AE	—	—	528	All	145	All
AEI	219	170	—	—	—	—
AEM	731	600	—	—	—	—

Rating GROUP IX Cont. (Aviation)	E-4		E-5		E-6		Rating GROUP IX Cont. (Aviation)	E-4		E-5		E-6	
	Passed	Advanced	Passed	Advanced	Passed	Advanced		Passed	Advanced	Passed	Advanced	Passed	Advanced
AG	264	All	133	All	30	All	PHA	94	80	—	—	—	—
AK	588	385	202	112	148	39	PHG	228	220	—	—	—	—
AM	—	—	—	—	209	190	PR	77	All	61	All	60	10
AME	144	30	36	All	—	—	PT	13	All	7	All	8	All
AMH	551	520	256	All	—	—	TD	—	—	101	80	78	22
AMS	868	750	430	All	—	—	TDI	126	All	—	—	—	—
AO	371	All	305	150	251	50	TDR	42	All	—	—	—	—
AQ	—	—	133	All	57	36	GROUP X (Medical)						
AQB	54	All	—	—	—	—	HM	1939	1200	1167	500	928	300
AQF	97	All	—	—	—	—	GROUP XI (Dental)						
AT	—	—	822	All	164	All	DT	332	265	121	88	102	5
ATN	675	All	—	—	—	—	GROUP XII (Steward)						
ATR	369	All	—	—	—	—	SD	1565	80	813	60	499	20
ATS	127	All	—	—	—	—							
GF	53	30	51	20	13	5							
PH	—	—	160	All	86	28							

DIRECTIVES IN BRIEF

This listing is intended to serve only for general information and as an index of current Alnavs and NavActs as well as current BuPers Instructions, BuPers Notices, and SecNav Instructions that apply to most ships and stations. Many instructions and notices are not of general interest and hence will not be carried in this section. Since BuPers Notices are arranged according to their group number and have no consecutive number within the group, their date of issue is included also for identification purposes. Personnel interested in specific directives should consult Alnavs, NavActs, Instructions and Notices for complete details before taking action.

Alnavs apply to all Navy and Marine Corps commands; NavActs apply to all Navy commands; BuPers Instructions and Notices apply to all ships and stations.

Note: This listing of directives covers a two-month period.

Alnavs

No. 47—Announced approval by the President of the reports of selection boards which recommended USN women officers for permanent promotion to the grade of commander and of USN and USNR officers to captain and commander, Medical Corps; Chaplain Corps; Supply Corps; Civil Engineer Corps; Dental Corps; Medical Service Corps and Nurse Corps.

No. 48—Announced the convening of selection boards to recommend line officers on active duty (except TARs) for temporary promotion to the grades of lieutenant commander and lieutenant; and for permanent promotion of USN women line officers to the grade of lieutenant commander.

No. 49—Announced approval by the President of the report of a selection board which recommended Marine Corps officers for temporary promotion to the grade of lieutenant colonel.

No. 50—Announced the death of General of the Army George C. Marshall at Walter Reed Hospital on 16 October.

No. 51, 52—Pertained to the burial of General of the Army George C. Marshall at Arlington National Cemetery.

No. 53—Announced approval by the President of a report by a selection board which recommended line officers on active duty for temporary promotion to the grade of commander.

No. 54—Announced that a need exists for additional student naval aviators for the second half of fiscal year 1960.

No. 55—Announced that, on 1 Dec 1959, all functions of the Bureau of Aeronautics and Ordnance

would be transferred to the Bureau of Naval Weapons (BuWeaps).

No. 56—Announced approval by the President of the reports of selection boards which recommended women Marine Corps officers on active duty for promotion to the grades of major and captain and Marine Corps officers on active duty for temporary promotion to the grade of captain.

No. 57—Required that the issue and resale of cranberries from certain areas be suspended.

No. 58—Announced the convening of selection boards to recommend staff corps officers on active duty (except TARs) for temporary promotion to lieutenant commander and lieutenant.

No. 59—Cancelled Alnav 57.

No. 60—Reminded all personnel that the approaching winter season would require renewed attention to possible highway hazards and worsened traffic conditions.

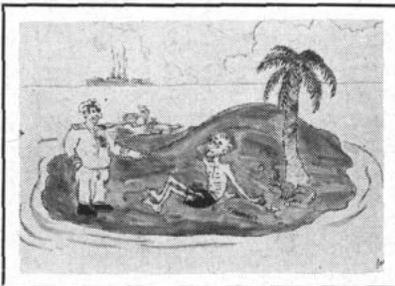
No. 61—Announced approval by the President of the reports of selection boards which recommended promotion of USN men and women line officers to the grades of lieutenant and lieutenant commander.

No. 62—Announced that applications from limited duty officer and integration candidates who took examinations on 15 June must be received in the Bureau of Naval Personnel not later than 15 December.

BuPers Instructions

No. 1000.9A—Advises naval activities as to the proper method of procurement, accounting and administration of U. S. Army personnel

All-Navy Cartoon Contest C. W. Paavilainen, BU2, USN



"I'm sorry you can't stay here, mister. They're going to fire a rocket this way from Cape Canaveral."

THE BULLETIN BOARD

on duty with the U. S. Navy.

No. 1000.15A—Announces the establishment of a PACFLT, WESTPAC and MIDPAC Leadership Field Team.

No. 1001.10D—Describes the prerequisites, administrative policies and procedures pertaining to Naval Reserve officers on active duty in connection with the training and administration of the Naval Reserve.

No. 1130.4F—Announces Change No. 2 to the basic instruction, concerned with enlistment in the Regu-

lar Navy of Naval Reserve personnel on active duty.

No. 1231.1A—Sets forth instructions and procedures for the Flight Status Selection Board.

No. 1301.23B—Describes the procedures to be used in effecting transfers of USN and USNR commissioned and warrant officers on active duty to armed services hospitals and medical facilities for treatment.

No. 1430.12A—Provides instructions for administration of the fiscal

year 1960 proficiency pay program.

No. 1440.5C—Announces information and regulations concerning changes in rate and rating of enlisted personnel on active duty.

No. 1520.6H—Provides information concerning applications from USN and USNR line officers on active duty and from Naval Academy and Regular NROTC midshipmen for the submarine school classes convening quarterly in January, April, July and October.

No. 1520.7A—Requests applications from code 110X and 17XX male naval officers for training in underwater demolition.

No. 5510.3G—Discusses requirements and procedures for security clearance of personnel ordered to duty under instruction in schools and courses requiring access to classified material.

BuPers Notices

No. 1085 (24 September)—Directed special attention in annual and other service-record verifications to the submarine designator (SS).

No. 5321 (14 October)—Deleted the requirement for submission of the Roster of Officers (NavPers 353).

No. 1210 (19 October)—Invited applications from certain permanently commissioned USN line officers for transfer to the Civil Engineer Corps.

No. 1210 (19 October)—Invited applications from certain permanently commissioned line USN officers for transfer to the Civil Engineer Corps.

No. 1210 (21 October)—Invited applications from eligible and career-motivated permanently commissioned USN line officers who are interested in transferring to the Supply Corps.

No. 1210 (21 October)—Invited applications from permanently commissioned USN line officers who are interested in transferring to the Supply Corps.

No. 1813 (23 October)—Modified provisions of the *BuPers Manual* to insure that no change is made in rating upon effecting transfer to the Fleet Reserve except in the case of certain USNR personnel.

No. 1418 (27 October)—Announced the schedule for service-wide examinations for enlisted personnel to be held in February.

No. 1080 (28 October)—Provided a standard procedure for personnel

What's the Chance of Moving Up after February Exam?

Based on past statistics, here are the chances you have of being rated as a result of the February exams. Here's what the numbers in the table below indicate:

1—Chances are excellent. Of those who pass, 70 to 100 per cent can be advanced.

2—Good. Of those who pass, from 35 to 70 per cent may be advanced.

3—Fair. From 10 to 35 per cent may be advanced.

4—Poor. Less than 10 per cent of those who pass the examination may be advanced.

RATING	E-4	E-5	E-6	E-7	RATING	E-4	E-5	E-6	E-7
GROUP I					EM	1	1	1	3
BM	3	3	3	1	EN	1	1	1	3
QM	1	1	2	1	IC	1	1	1	1
RD	1	1	1	3	ML	1	3	4	1
SM	1	1	1	1	MM	1	1	1	1
SO	1	1	1	1	MR	1	1	1	3
GROUP II					PM	1	1	1	1
FT	1	1	2	3	SF	1	1	2	4
GM	2	3	3	2	GROUP VIII				
GS	1	1	2	1	BU	1	1	1	4
MN	1	2	3	2	CE	1	1	1	1
NW	1	1	1	1	CM	1	2	4	4
TM	1	1	1	1	EO	2	3	4	4
GROUP III					SV	1	1	1	1
ET	1	1	1	2	SW	1	1	2	3
GROUP IV					UT	1	1	2	1
IM	2	1	3	2	GROUP IX				
OM	1	1	1	1	AB	1	1	2	4
GROUP V					AC	1	2	2	3
CS	2	3	4	3	AD	1	3	3	2
CT	1	1	1	3	AE	1	1	1	3
DK	1	1	3	2	AG	1	1	1	2
JO	1	1	1	1	AK	2	2	3	3
MA	1	1	2	2	AM	1	1	1	2
PN	1	1	2	3	AO	1	2	3	1
RM	1	1	1	3	AQ	1	2	2	3
SH	3	4	4	4	AT	1	1	1	1
SK	1	1	2	1	GF	3	2	2	3
TE(RM)			1	3	PH	1	1	3	3
YN	1	2	3	3	PR	1	2	3	3
GROUP VI					PT	1	1	1	1
DM	2	1	1	3	TD	1	1	3	3
LI	2	3	4	3	GROUP X				
MU	1	1	1	1	HM	2	3	3	1
GROUP VII					GROUP XI				
BR			1	1	DT	1	1	4	3
BT	1	1	1	3	GROUP XII				
DC	1	3	4	3	SD	4	4	4	4

accounting of officer and enlisted personnel with ultimate orders to ships being reactivated from Reserve Fleet status, new construction, major conversions, and ships acquired from building activities.

No. 1430 (5 November)—Announced that certain personnel would be advanced in rating to senior and master chief petty officer.

No. 7220 (6 November)—Requested information on the number of naval personnel authorized and receiving basic allowance for subsistence when rations in kind are not available.

No. 1430 (9 November)—Provided information regarding advancements resulting from the August Navy-wide examinations, and regarding the opportunities for advancement which it is estimated will exist in the February exams.

No. 1221 (16 November)—Alerted all commands to the distribution of the *Manual of Navy Enlisted Classifications* and provided instructions for specific coding actions.

No. 1210 (20 November)—Notified the naval service of the designator changes to be made as a result of the transfer of line LDO categories to the 6XXX numerical series.

No. 1611 (20 November)—Announced that, under certain conditions, it would be unnecessary to submit fitness reports for brief periods of time.

No. 1700 (23 November)—Announced the fifth All-Navy comic cartoon contest.

Scholarships for Navy Juniors Set Up by Officers' Wives

The Officers' Wives Club of the U.S. Naval Training Center, Bainbridge, Md., has established an annual scholarship award for the academic years, 1960-61, 1961-62, 1962-63. The award of \$250 per year will be used for education at the college level.

The recipient of the award will be selected on the basis of need, scholastic standing, character and leadership. Those eligible must be:

- A dependent son or daughter of an officer or an enlisted man of the regular Navy or Marine Corps, who is serving on active duty, retired with pay, or who has died on active duty or following retirement.
- A graduate or prospective grad-

uate of an accredited high school or one with equivalent standards of education. (A student already attending college may apply.)

If several individuals have equal qualifications, preference will be given to an applicant who is a dependent of naval or Marine Corps personnel who are or have been stationed at Bainbridge, Md.

The scholarship must be used for educational expenses at an accredited college for the academic year following the grant.

Application forms may be obtained from the Chief of Naval Personnel (Pers-G221), Navy Department, Washington 25, D. C., or from any naval district commandant.

These applications must be returned to the Bureau of Naval Personnel no later than 20 March. The recipient of the award will be announced in May.

List of New and Revised Correspondence Courses for Officers and Enlisted Men

One new officer correspondence course and nine new enlisted correspondence courses are now available to Regular and Reserve Navymen.

The officer course—**Leadership** (NavPers 10903-A)—is given in six assignments, and is evaluated at 12 points credit for purposes of Naval Reserve retirement and promotion.

The new enlisted courses are:

Dental Technician Prosthetic 3 & 2 (NavPers 91686-1)—eight assignments and 24 retirement points.

Steward 1 & C (NavPers 91696)—three assignments and nine retirement points.

Steward 3 & 2 (NavPers 91693-2)—five assignments and 15 retirement points.

Aviation Storekeeper 3 & 2 (NavPers 91674)—seven assignments and a total of 21 retirement points.

David J. Majchrzak, DN, USNR



"If voodoo works you're in trouble, Chief!"

Ship's Serviceman Barber Handbook (NavPers 91465-1)—two assignments and six retirement points.

Boatswain's Mate 1 & C (NavPers 91245-2)—five assignments and 15 retirement points.

Ship's Serviceman 1 & C (NavPers 91450)—five assignments and 15 retirement points.

Builder 1 & C (NavPers 91586-1)—seven assignments and 21 retirement points.

Mineman 1 & C, Volume I (NavPers 91336-1)—five assignments and 15 retirement points.

The above courses may be retaken for repeat Naval Reserve credit.

Another officer correspondence course—**Basic Nuclear Physics** (NP 10901-A)—has been re-evaluated at 20 promotion and retirement points. These will be credited as follows:

Unit 1—12 points upon satisfactory completion of assignments 1 through 3.

Unit 2—Eight points upon satisfactory completion of assignments 4 and 5.

The Reserve Officer Recording Activity at Omaha, Neb., will make the necessary changes without action on the part of the individuals concerned.

A total of 16 enlisted correspondence courses have been discontinued in the latest action on the subject. They are:

Builder C (NavPers 91586-B)
Builder 1 (NavPers 91585-1A)
Mineman 1 (NavPers 91336-B)
Mineman C (NavPers 91337-A)
Steward 1 (NavPers 91694-D)
Steward C (NavPers 91695-B)
Boatswain's Mate 1 (NavPers 91244-1B)

Boatswain's Mate C (NavPers 91245-1C)

Aircraft Engines (NavPers 91628-1C)

Handbook for Dental Prosthetic Tech. 3 (NavPers 91685)

Handbook for Dental Prosthetic Tech. 2 (NavPers 91686-B)

Ship's Serviceman 1 (NavPers 91448-1A)

Ship's Serviceman C (NavPers 91449-1)

Torpedoman's Mate 1 (NavPers 91305-B)

Torpedoman's Mate C (NavPers 91307-B)

Ship's Serviceman Barber Handbook (NavPers 91465-A).

BOOKS

A LITTLE OF EVERYTHING IN THIS MONTH'S CHOICE

AS A RULE, a general theme may be found in each of the group of books selected for review. Not this time. Subjects range from Hawaii to the South Pole; from philosophy to sheer adventure. Look for some of them at your ship or station library.

If you've ever been stationed at Pearl Harbor, you'll be interested in *Hawaii*, by James A. (*South Pacific*) Michener. Here is the story of Hawaii, told in terms of the people who made it and the forces of nature which shaped it. He first tells the story of the island's creation millions of years before man, as the volcanic islands rose from the sea, fell again, were rebuilt by the coral, by beds of lava, and slowly populated by vegetation and life. Then came the passionate, courageous and adventurous seafarers from other islands—and finally the missionaries. Michener then describes the advent of the traders, land owners, merchants, shippers and planters—founders of dynasties who for generations controlled the social, political and economic power of the island. The circumstances under which Hawaii acquired its polyglot nature are dealt with fully.

90° South, by Paul Siple, is the other obvious geographical selection. Paul Siple was the Boy Scout chosen to accompany RADM Richard E. Byrd's first expedition to the Antarctic in 1927. Since that time, Siple's life has been primarily concerned with arctic exploration and, during the winter (summer months, to us) of 1956/57 he was in command of the civilian scientists who lived at the South Pole in connection with the U. S. contributions to IGY. Dr. Siple tells of the history of early south-polar exploration, of his personal reminiscences of ADM Byrd, and details of everyday life and problems on what may very well be the coldest spot on earth. (On 18 Sep 1957, the temperature was minus 102.1 F, and all hands were disappointed because it didn't go lower.) The primary accent of his story, however, is on the 24 Seabees who built the eight huts in which the party lived, and the experiences of the 18 men who spent a year in the community. Good reading.

Good reading of rugged men in tough situations may also be found

in *Most Dangerous Sea*, a history of mining and mine warfare by LCDR Arnold S. Lott, usn. *Dangerous Sea* is not a bare recital of the operations of the minesweepers. It is primarily the story of the men who took their wooden-hulled, unmanned ships into the enemy's front yard, or monotonously swept the channels of our own ports. Reservists will be interested to note that the U. S. Navy's minelayer and minesweeper personnel (except for a few senior officers) were almost exclusively Reservists who, up to the present have received little publicity and few rewards for daring deeds well done. That oversight is now remedied.

Behind Enemy Lines by James D. Sanderson also has plenty of adventure and tales of courage. It consists of 10 accounts of suicidal missions of World War II in which success or survival depended on minute-to-minute guts and ingenuity. The men involved did not fight in great battles as line troops. They fought as raiders, as partisans, as pilots, as snipers—mostly behind enemy lines. A small group lands behind German lines in North Africa to raid Rommel's headquarters and "eliminate" the general; four "human torpedoes"

For Quarter of a Century

Naval Customs, Traditions, and Usage—for 25 years a leading reference book among Navymen—is now available in a new and much-revised edition.

Written by Vice Admiral Leland P. Lovette, usn (Ret.), the book was originally published in 1934. Since then it has gained wide acceptance as an important source of information on naval and nautical lore, service etiquette and such.

In the new, fourth edition about half the material which appeared in earlier versions has been rewritten, and most of the remaining text has been thoroughly revised. An entirely new chapter on the Marine Corps has been added, and many of the illustrations are also new.

The book is published by the United States Naval Institute, Annapolis, Md.

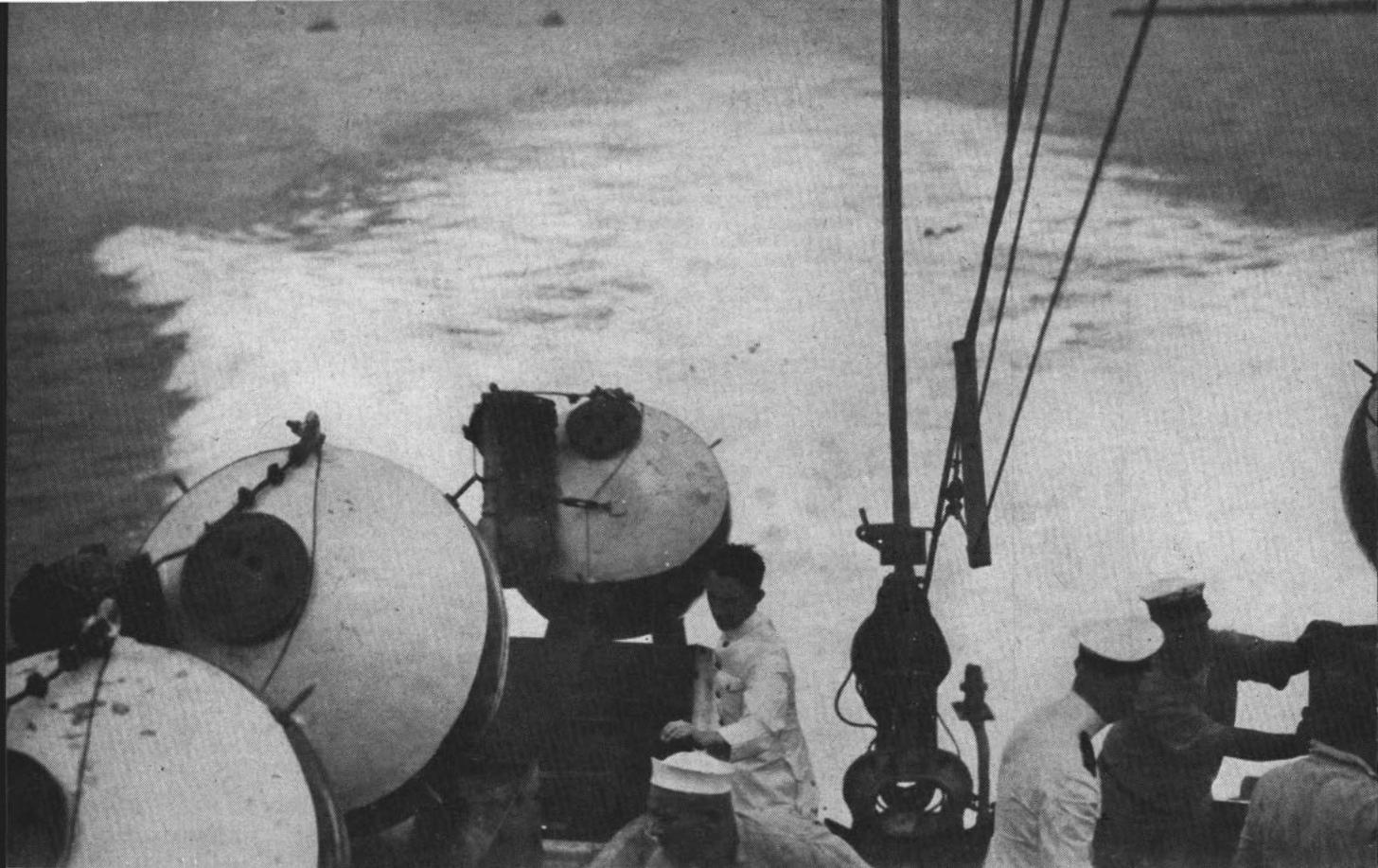
sink the battleships *Valiant* and *Queen Elizabeth*; a team parachutes into occupied Norway to blow up a super-secret German plant; a miner organizes a guerrilla band in the Philippines; a tiny private army roams the North African desert, fighting a hit-and-run war with armed jeeps. Strictly gee-whizz stuff. Interestingly enough, all the "heroes" were decidedly non-conformists.

To bring your blood pressure down to normal, you might consider *Triumph in the West*, by Sir Arthur Bryant, and *The Question of National Defense* by Oskar Morgenstern. Most of the preceding volumes were concerned with events at the operational level. Here, we review the "why" behind the events. *Triumph* is history written as it was being made, based upon the personal diaries of Field Marshall Lord Alanbrooke. It is the sequel to *The Turn of the Tide* which describes World War II from September 1943 to VE Day, 8 May 1945. It discusses the men who made history—Churchill, Eisenhower, Stalin and Roosevelt—and the decisions they had to make: The Italian campaign, the invasion of southern France, D-Day; and records the progress of the war from the planning boards to the battlefield.

The Question of National Defense takes the position that, if we were to be attacked now, our present system of national defense couldn't possibly save us. Our missile and bomber bases, situated permanently in well-known areas, would be wiped out before they got off the ground. The solution? Navymen will be happy to know that he proposes that we move our bases off land and put them on the oceans. Our ballistic missiles would be fired from submerged nuclear-powered submarines that would move about freely. We could also use nuclear-powered seaplanes, supported on the oceans from submarines. Does the proposal sound familiar? It should. The Chief of Naval Operations has been suggesting such a course for years.

One fiction title selected this month is *The Strong Men* by John Brick. It is concerned with the Revolutionary War and Valley Forge.

The Library Services Branch also includes for your consideration *How to Speak and Write With Humor* by Percy H. Whiting. The publisher's blurb recommends it to those who not only enjoy being funny but have to be. Now, make us laugh, Mac.



Book Supplement —

Sewing Up the Subs

During World War I (as in World War II), German subs at one time very nearly tipped the scales of victory. However, the subs could be severely handicapped if their outlets to the Atlantic—the Strait of Dover to the south and the passageway of the North Sea that stretched between the Shetland Islands and Norway to the north, could be closed. The problem and its solution are described here by RADM (later Admiral) William S. Sims, USN.

BY APRIL 1917, the British had laid more than 30,000 mines in the Bight of Heligoland, and were then increasing these obstructions at the rate of 3000 mines a month. Yet this vast explosive field did not prevent the Germans from sending their submarines to sea. The enemy sweepers were dragging out channels through the mine-fields almost as rapidly as the British were putting new fields down. We could not prevent this, because protecting vessels could not remain so near the German bases without losses from submarine attacks.

Moreover, the Germans also laid mines in the same area in order to trap the British mine-layers; and these operations resulted in very considerable losses on each side. These impediments made the egress of a submarine a difficult and nerve-racking process; it sometimes required two or three days and the assistance of a dozen or so surface vessels to get a few submarines through the Heligoland Bight into open waters. Several were unquestionably destroyed in the operation, yet the ac-

tivity of submarines in the Atlantic showed that these mine-fields were no more than a harassing measure.

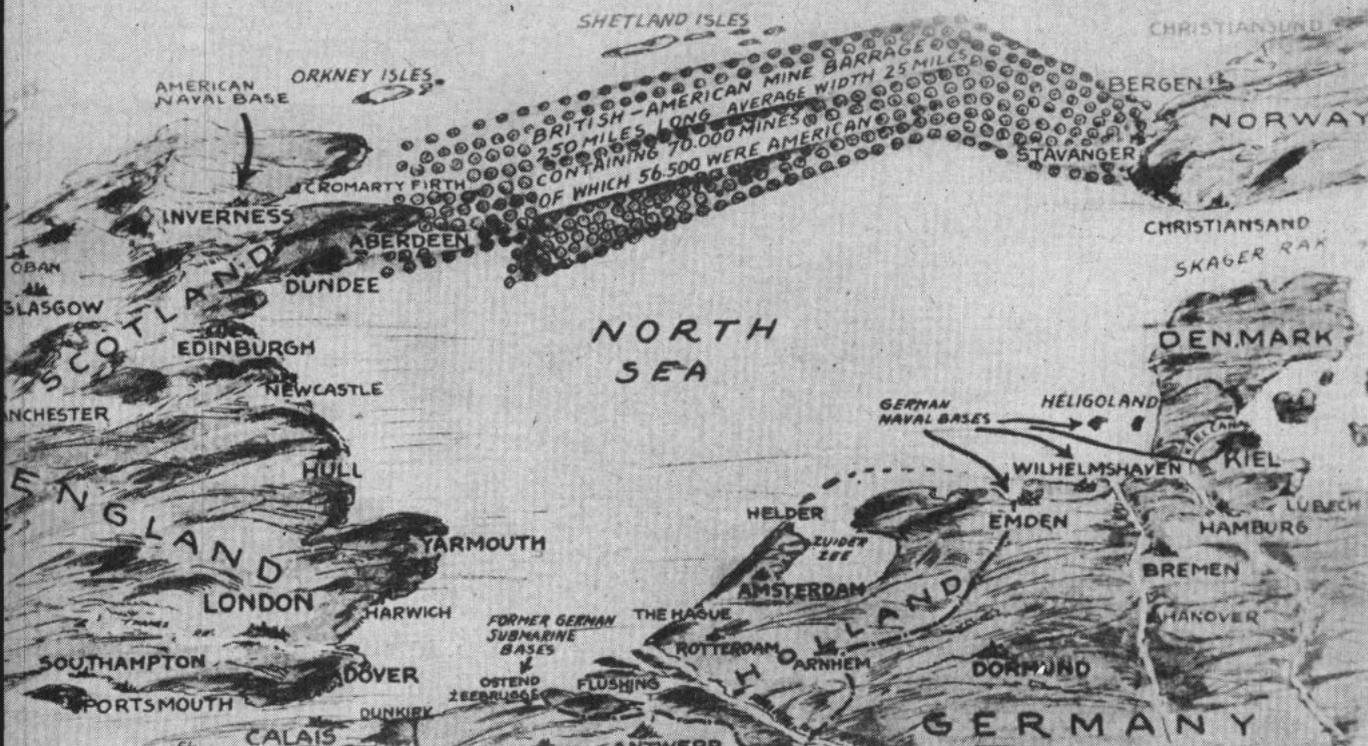
It was estimated that, to be effective, the North Sea barrage would require about 400,000 mines, far more than existed in the world at that time, and far more than all our manufacturing resources could then produce within a reasonable period.

WE DID NOT HAVE a mine which could be laid in such deep waters in sufficient numbers to have formed any barrier at all; and even if we had possessed one, the construction of the barrage would have demanded such an enormous number that they could not have been manufactured in time to finish the barrage until late in the year 1918. (The principal fact which made possible this great enterprise was the invention of an entirely new type of mine.)

The old mine consisted of a huge steel globe, filled with high explosive, which could be fired only by contact. That is, it was necessary for the surface of a ship, such as a submarine, to strike against the surface of the mine, and in this way start the mechanism which ignited the explosive charge.

The fact that this immediate contact was essential enormously increased the difficulty of successfully min-

Abridged *Victory at Sea*, by Rear Admiral William S. Sims, USN, with copyright date of 1919, 1920, published by Doubleday, Page & Company. Reprinted with permission of Mrs. William S. Sims, copyright owner.



HERE'S HOW the mine barrage, some 250 miles long, bottled up the German submarines in the North Sea.

ing waters that ranged in depth from 400 to 900 feet. If the mines were laid anywhere near the surface, the submarine, merely by diving beneath them, could avoid all danger; if they were laid at any considerable depth, it could sail with complete safety above them.

Thus, if such a mine were to be used at all, we should have had to plant several layers, one under the other, down to a depth of about 250 feet, so that the submarine, at whatever depth it might be sailing, would be likely to strike one of these obstructions. This required such a large number of mines as to render the whole project impossible.

IT WAS an American who invented an entirely new type of mine and therefore solved this difficulty.

In the summer of 1917 Mr. Ralph C. Browne, an electrical engineer of Salem, Mass., offered a submarine gun for the consideration of CDR S. P. Fullinwider, USN, who was then in charge of the mining section of the Bureau of Ordnance. As a submarine gun this invention did not seem to offer many chances of success, but CDR Fullinwider realized that it contained a firing device of great promise. The Bureau of Ordnance, assisted by Mr. Browne, spent the summer and fall experimenting with this contrivance and perfecting it; the English mining officers who had been sent to America to cooperate with the U. S. Navy expressed great enthusiasm over it; and some time about the beginning of August 1917, the Bureau of Ordnance came to the conclusion that it was a demonstrated success.

The details of Mr. Browne's invention are too intricate for description here, but its main point is comprehensible enough. Its great advantage was that it was not necessary for the submarine to strike the mine to explode it.

The mine could be located at any depth and from it a long "antenna," a thin copper cable, reached up to within a few feet of the surface, where it was supported

in that position by a small metal buoy. Any metallic substance, such as the hull of a submarine, simply by striking this antenna at any point, would produce an electric current, which, transmitted to the mine, would cause this mine to explode.

THE GREAT ADVANTAGE of this device is at once apparent. Only about one fourth of the number of mines required under the old conditions would now be necessary. The Mining Section estimated that 100,000 mines would form a barrier that would be extremely dangerous to submarines passing over it or through it. This implies more than a mere saving in manufacturing resources; it meant that we would need a proportionately smaller number of mine-laying ships, crews, officers, bases, and supplies.

Another circumstance which made the barrage a feasible enterprise was that by the last of the year 1917 it was realized that the submarine had ceased to be a decisive factor in the war. It still remained a serious embarrassment, and every measure which could possibly thwart it should be adopted. But the writings of German officers which have been published since the war make it apparent that they themselves realized early in 1918 that they would have to place their hopes of victory on something else besides the submarine.

But the submarines were still a distinct menace and they were still causing serious losses. The more energetically we prosecuted every form of opposition, the earlier would the enemy's general morale break down and victory be assured.

THEREFORE, on November 2, 1917, the so-called "Northern Barrage" project was officially adopted by both the American and British governments. The proposed mine-field was as long as the distance from Washington to New York. Nothing like it had ever been attempted before. The combined operation involved a

mass of detail which the lay mind can hardly comprehend. The cost—\$40,000,000—is perhaps not an astonishing figure in the statistics of this war, but it gives some conception of the size of the undertaking.

During the two years preceding the war, Captain Reginald R. Belknap commanded the mine-laying squadron of the Atlantic Fleet. Although his force was small, consisting principally of two antiquated warships, *USS Baltimore* and *San Francisco*, Captain Belknap had performed his duties conscientiously and ably, and his little squadron therefore gave us an excellent foundation on which to build.

Before the European War the business of mine-laying had been unpopular in the American Navy as well as in the British; such an occupation, as Sir Eric Geddes once said, had been regarded as something like that of "rat catching." As hostilities went on, however, and the mine developed great value as an anti-submarine weapon, this branch of the service began to receive more respectful attention.

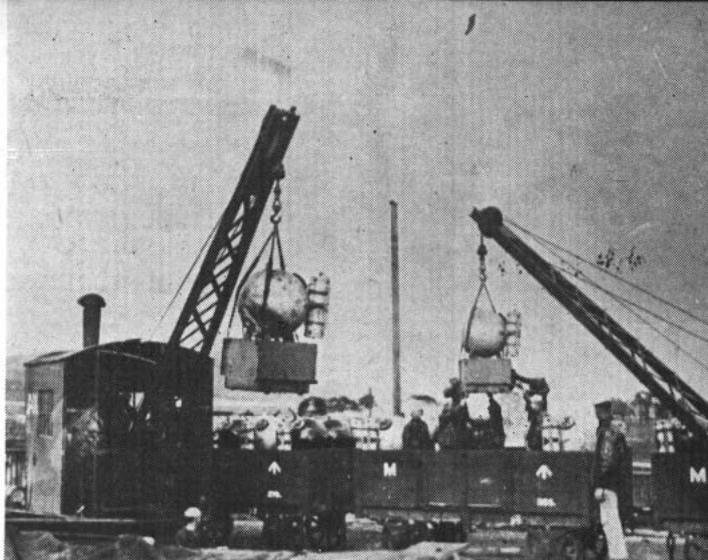
Captain Belknap's work not only provided the nucleus out of which the great American mine force was developed, but he was chiefly responsible for organizing this force. The "active front" of our mine-laying squadron was found in the North Sea; but the sources of supply lay in a dozen shipyards and several hundred manufacturing plants in the United States.

WE BEGAN THIS WORK with practically nothing; we had to obtain ships and transform them into mine-layers; to enlist and to train their crews; to manufacture at least 100,000 mines; to create bases both in the United States and Scotland; to transport all of our supplies more than 3,000 miles of wintry sea, part of the course lying in the submarine zone; and we had to do all this before the real business of planting could begin.

Captain Belknap's men were very proud of their mine-layers and in many details they represented an improvement over anything which had been hitherto employed in such a service.

Originally, these mine-layers had been coastwise vessels; two of them were *Bunker Hill* and *Massachusetts*,

GERMAN SUB TARGETS—Mine barrage helped protect convoys crossing the Atlantic by cutting down enemy subs.

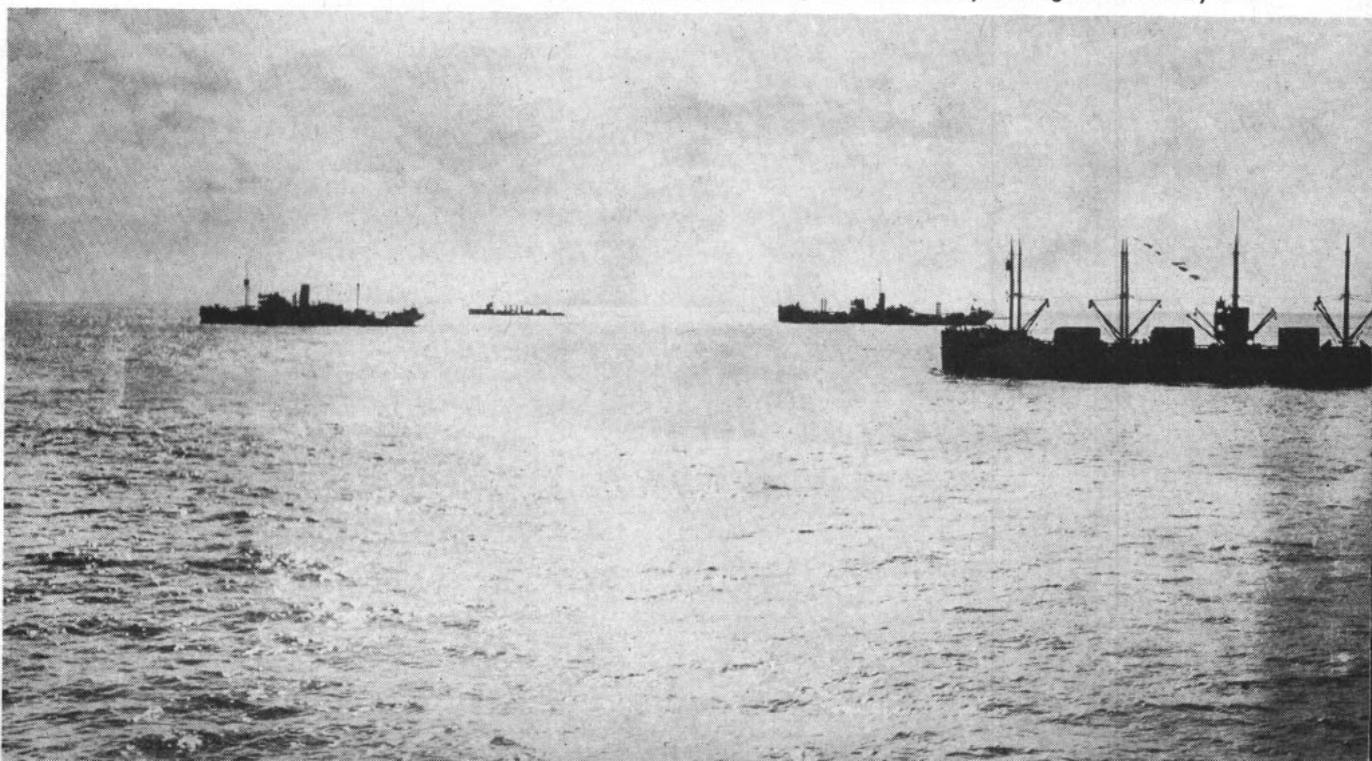


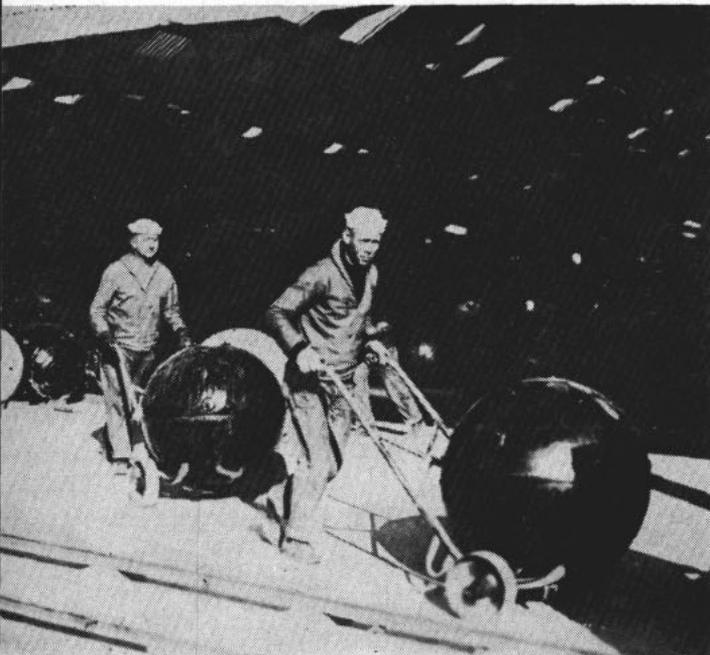
ON THE WAY—Cranes load railway cars with mines to be delivered to the Fleet of ten minelayers for planting.

which for years had been "outside line" boats, running from New York to Boston; all had dropped the names which had served them in civil life and were rechristened for the most part with names which eloquently testified to their American origin — *Canonicus*, *Shawmut*, *Quinnebaug*, *Housatonic*, *Saranac*, *Roanoke*, *Aroostook*, and *Canandaigua*.

These changes in name were entirely suitable, for by the time our forces had completed their alterations the ships bore few resemblances to their former state. The cabins and saloons had been gutted, leaving the hulls little more than empty shells; three decks for carrying mines had been installed; on all these decks little railroad tracks had been built on which the mines could be rolled along the lower decks to the elevators and along the upper mine deck to the stern and dropped into the sea.

Particularly novel details, something entirely new in mine-layers, were the elevators, the purpose of which was to bring the mines rapidly down from the lower decks to the launching track. So rapidly did the work





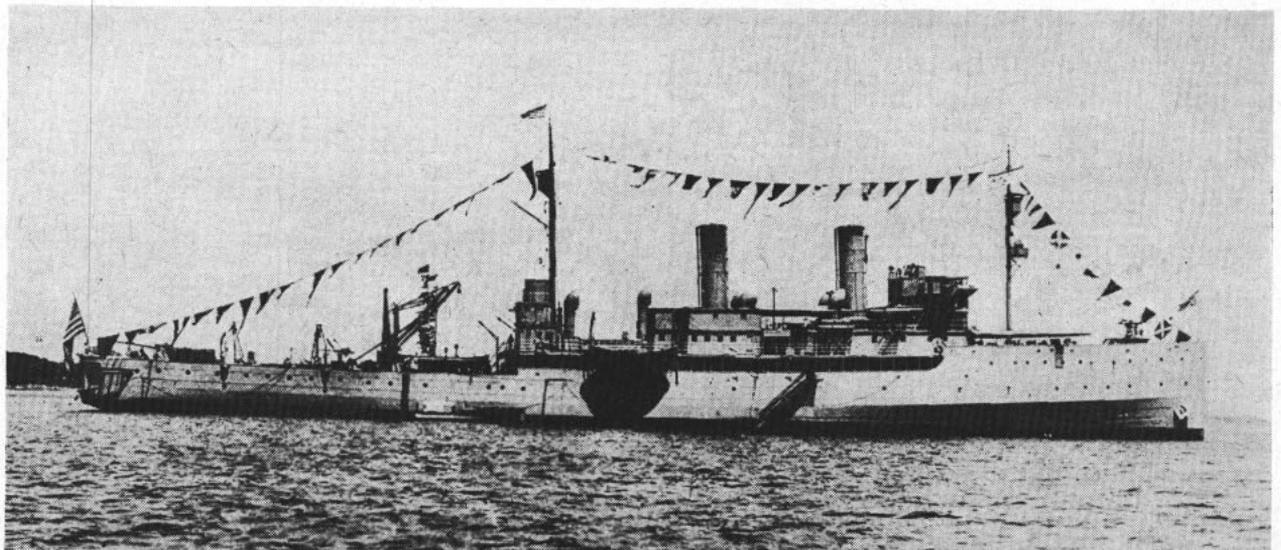
ON THE BALL—Hard-working Navymen formed a well trained team completing gigantic job in record time.

progress, and so well were the crews trained, that, in May 1918, the first of these 10 ships weighed anchor and started for their destination in Scotland.

THE MINES WERE LAID in a series of 13 expeditions, or "excursions," as our men somewhat cheerfully called them. The 10 mine-layers participated in each "excursion," all 10 together laying about 5,400 mines at every trip. Each trip to the field of action was practically a duplicate of the others; a description of one will, therefore, serve for all.

After days, and sometimes after weeks of preparation the squadron, usually on a dark and misty night, showing no lights or signals, would weigh anchor, slip by the rocky palisades of Moray Firth, and stealthily creep out to sea. As the ships passed through the nets and other obstructions and reached open waters, the speed in-

ON THE JOB—USS *Shawmut* was one of 10 ships converted from coastwise vessels for special minelaying job.



creased, the gunners took their stations at their batteries, and suddenly from a dark horizon came a group of low, rapidly moving vessels; these were the British destroyers from the Grand Fleet which had been sent to escort the expedition and protect it from submarines.

The absolute silence of the whole proceeding was impressive; not one of the mine-layers gave the slightest sign of recognition; all these details had been arranged in advance, and everything now worked with complete precision. The swishing of the water on the sides and the slow churning of the propellers were the only sounds that could possibly betray the ships to their hidden enemies.

After the ships had steamed a few more miles the dawn began to break; and now a still more inspiring sight met our men. A squadron of battleships, with scout cruisers and destroyers, suddenly appeared over the horizon. This fine force likewise swept on, apparently paying not the slightest attention to our vessels. They steamed steadily southward, and in an hour or so had entirely disappeared.

The observer would hardly have guessed that this squadron from Admiral Beatty's fleet at Scapa Flow had anything to do with the American and British mine-layers. Its business, however, was to establish a wall of steel and shotted guns between these forces and the German battle fleet at Kiel.

NOW IN THE OPEN SEAS the 10 mine-layers formed in two columns, abreast of each other and 500 yards apart, and started for the waters of the barrage. Twelve destroyers surrounded them, on the lookout for submarines, for the ships were now in the track of the U-boats bound for their hunting ground or returning to their home ports.

At a flash from the flagship all slackened speed, and put out their paravanes — those under-water outrigger affairs which protected the ships from mines; for it was not at all unlikely that the Germans would place some of their own mines in this field, for the benefit of the barrage builders.

This operation took only a few minutes; then another flash, and the squadron again increased its speed. It steamed the distance across the North Sea to Udsire

Light, then turned west again and headed for that mathematical spot on the ocean which was known as the "start point" — the place, that is, where the mine-laying was to begin.

In carrying out all these maneuvers the commander was thinking not only of the present, but of the future; for the time would come, after the war had ended, when it would be necessary to remove all these mines, and it was therefore wise to "fix" them as accurately as possible in reference to landmarks, so as to know where to look for them. All this time the men were at their stations, examining the mines to see that everything was ready, testing the laying mechanisms, and mentally rehearsing their duties.

AT ABOUT FOUR O'CLOCK a signal came from the flagship:

"Have everything ready, for the squadron will reach 'start point' in an hour and mine-laying will begin."

Up to this time the ships were sailing in two columns; when they came within seven miles of "start point," another signal was broken out; the ships all wheeled like a company of soldiers, each turning sharply to the right, so that in a few minutes, instead of two columns, we had eight ships in line abreast, with the remaining two, also in line abreast, sailing ahead of them.

This splendid array, keeping perfect position, approached the starting point like a line of racehorses passing under the wire. Not a ship was off this line by so much as a quarter length; the whole atmosphere was one of eagerness; the officers all had their eyes fixed upon the stern of the flagship, for the glimpse of the red flag which would be the signal to begin. Suddenly the flag was hauled down, indicating:

"First mine over."

If you had been following one of these ships, you would probably have been surprised at the apparent simplicity of the task. The vessel was going at its full speed; at intervals of a few seconds a huge black object, about five feet high, would be observed gliding toward the stern; at this point it would pause for a second or two, as though suspended in air; it would then give a mighty lurch, fall head first into the water, sending up a great splash, and then sink beneath the waves.

By the time the disturbance was over the ship would have advanced a considerable distance; then, in a few seconds, another black object would roll toward the stern, make a similar plunge, and disappear. You might have followed the same ship for two or three hours, watching these mines fall overboard at intervals of about fifteen seconds.

THERE WERE FOUR PLANTERS, each of which could and did on several trips lay about 860 mines in three hours and thirty-five minutes, in a single line about 44 miles long. These were *Canandaigua*, *Canonicus*, *Housatonic*, and *Roanoke*.

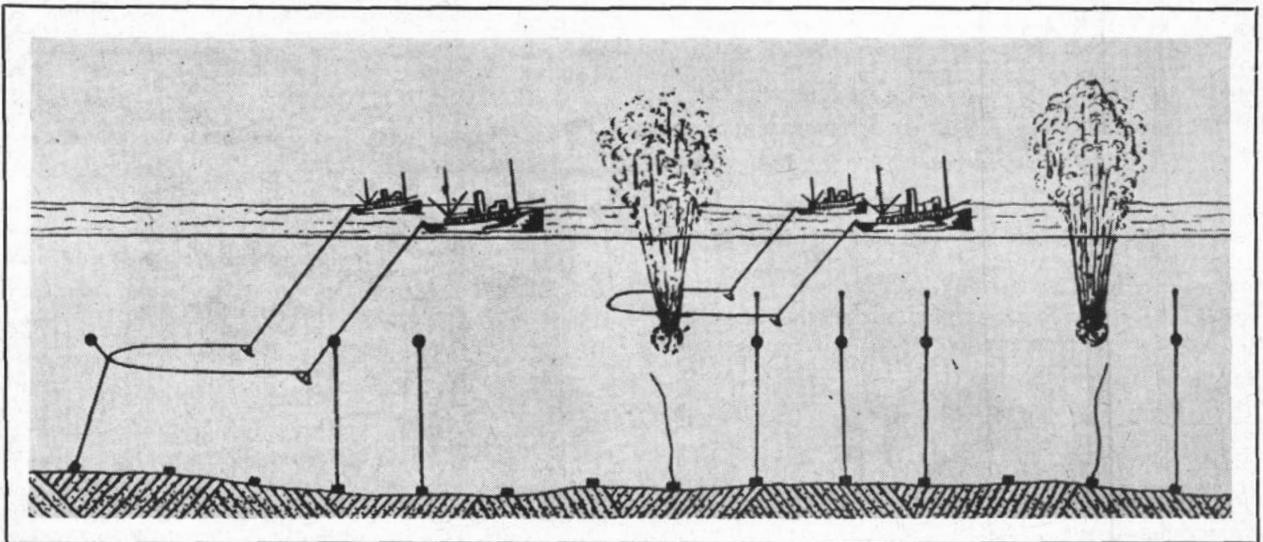
Occasionally, the monotony of this procedure would be enlivened by a terrible explosion, a great geyser of water rising where a mine had only recently disappeared. This meant that the "egg," as the sailors called it, had gone off spontaneously, without the existence of any external contact. Such accidents were part of the game, the records showing that about four per cent of all the mines indulged in such initial premature explosions.

For the most part, however, nothing happened to disturb the steady mechanical routine. The mines went over with such regularity that, to an observer, the whole proceeding seemed hardly the work of a human agency. Yet every detail had been arranged months before in the United States; the mines fell into the sea in accordance with a time table which had been prepared in Newport before the vessels started for Scotland. Every man on the ship had a particular duty to perform and each performed it in the way in which he had been schooled under the direction of Captain Belknap.

It took a crew of hard-working, begrimed, and sweaty men to keep these mines moving and going over the stern at the regularly appointed intervals. After three or four hours had been spent in this way and the ships had started back to their base, the decks would sometimes be covered with the sleeping figures of exhausted men.

It would be impossible to speak too appreciatively of the spirit they displayed; in the whole summer there was not a single mishap of any importance. The men all felt that they were engaged in a task which had never been accomplished before, and their exhilaration increased with almost every mine that was laid.

DIAGRAM OF big sweeping job that came after the war shows how mines with antennas formed effective barrier.



TAFFRAIL TALK

WE'RE HAPPY to know that whatever we do is news to someone. Over the past year or so, we've noted that our activities have been the subject of numerous articles in kindred publications. Apparently we are as important to our fellow journalists as we think we are.

We quote: "All Hands Must Carry Responsibility for Defense of Country," says the "Boston Naval Shipyard News." As we look about the office at the News Desk, the Research Section and the Art Department, we shudder for the safety of our country.

Not only must we defend our country, but we must do it economically. Again we quote, this time from the "Jax Air News": "Responsibility of Conserving Funds Is An All Hands Job." An excellent idea and one we're about to act upon almost any day. If we can make our funds stretch out until payday, we'll be all set.

However, our activities are not confined to the larger issues of the day. We too, are compelled to cope with the dull mechanics of day-to-day living. The "Gator" tells its public: "Moving Uses All Hands for Phi Gru Two," and, again, a publication whose name escapes us at the moment asserts: "All Hands Asked to Cooperate in Fire Prevention." Make up your mind, will you, buster? We can only do one thing at a time.

However, life does have its lighter moments for us. Another unnamed publication offers the headline: "Dance Committee Invites All Hands to Turkey Trot," and, presumably while there, according to "The Beam," of Corpus Christi, "Operation Pickup Is All Hands Job." Nice work if you can get it.

We don't remember the details but apparently the evening was a success.

"All Hands Absent," reports the "Hoist" of NTC San Diego. Presumably the morning after.

★ ★ ★

We are not the only ones who lead an active life. We refer you to the busy destiny of G. F. Williams of Newport, R. I. Here's the situation:

In June of 1958 Williams, then DC1, took his exams for W-1 and LDO; in November, for proficiency pay. In January, he started off the year by drawing his first pro-pay check. Then he took his CPO exam. Shortly after, the Warrant Officer eligibility list appeared and whose name turned up? You're correct.

A few weeks later, the CPO exam results were published—and sure enough. Two weeks later, Williams learned he had been selected for ensign in the LDO program.

This brings us up to October 1959. Most of the month was comparatively dull, but he did have a few busy days. On 28 October, Mrs. Williams gave birth to a son, with the anxious father being credited with an assist just as the family arrived at the hospital. On 29 October, with his wife in the hospital with son No. 2, Williams took emergency leave to take care of No. 1 son, returning the next day to duty to be sworn in as W-1.

This month Mr. Williams assumes the rank of ensign. Who says there is lack of opportunity in the Navy?

The All Hands Staff

The United States Navy

Guardian of our Country

The United States Navy is responsible for maintaining control of the sea and is a ready force on watch at home and overseas, capable of strong action to preserve the peace or of instant offensive action to win in war.

It is upon the maintenance of this control that our country's glorious future depends. The United States Navy exists to make it so.

We Serve with Honor

Tradition, valor and victory are the Navy's heritage from the past. To these may be added dedication, discipline and vigilance as the watchwords of the present and future. At home or on distant stations, we serve with pride, confident in the respect of our country, our shipmates, and our families. Our responsibilities sober us; our adversities strengthen us.

Service to God and Country is our special privilege. We serve with honor.

The Future of the Navy

The Navy will always employ new weapons, new techniques and greater power to protect and defend the United States on the sea, under the sea, and in the air.

Now and in the future, control of the sea gives the United States her greatest advantage for the maintenance of peace and for victory in war. Mobility, surprise, dispersal and offensive power are the keystones of the new Navy. The roots of the Navy lie in a strong belief in the future, in continued dedication to our tasks, and in reflection on our heritage from the past. Never have our opportunities and our responsibilities been greater.

ALL HANDS The Bureau of Naval Personnel Information Bulletin, is published monthly by the Bureau of Naval Personnel for the information and interest of the naval service as a whole. Use of funds for printing of this publication is approved by the Director of the Bureau of the Budget 25 June 1958. Opinions expressed are not necessarily those of the Navy Department. Reference to regulations, orders and directives is for information only and does not by publication herein constitute authority for action. All original material may be reprinted as desired if proper credit is given ALL HANDS. Original articles of general interest may be forwarded to the Editor. DISTRIBUTION: By Section B-3203 of the Bureau of Naval Personnel Manual, the Bureau directs that appropriate steps be taken to insure that all hands have quick and convenient access to this magazine, and indicates that distribution should be effected on the basis of one copy for each 10 officers and enlisted personnel to accomplish the purpose of the magazine.

The Bureau invites requests for additional copies as necessary to comply with the basic directives. This magazine is intended for all hands and commanding officers should take necessary steps to make it available accordingly.

The Bureau should be kept informed of changes in the number of copies required.

The Bureau should also be advised if the full number of copies is not received regularly.

Normally copies for Navy activities are distributed only to those on the Standard Navy Distribution List in the expectation that such activities will make further distribution as necessary; where special circumstances warrant sending direct to sub-activities the Bureau should be informed.

Distribution to Marine Corps personnel is effected by the Commandant U. S. Marine Corps. Request from Marine Activities should be addressed to the Commandant.

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● At RIGHT: OH BUOY—Cruisermen of USS Des Moines (CA 134) moor to a buoy as the Sixth Fleet Flagship pulls into port at Valletta, Malta, during break in operations in the Mediterranean. ▶



**MORE
POWER
AT
SEA**

