NAVAL AVIATION NEWS

41st Year of Publication

MARCH 1960

NavAer No. 00-75R-3

BRIGHT LIGHTS ON THE 'BIG BEN'

Camera and lights conspire to present the USS Bennington (CVS-20) dramatically. This night shot was taken by Stephen D. Page, AN, when the big carrier rested in drydock at Hunter's Point. The CVS emerged from the yard in February to undertake her new role.

■ COVER

In this issue begins a series on the Navy's Role in Space. The cover highlights the National Aeronautics and Space Administration Project Mercury, showing a full scale model of the capsule and type of full pressure suit designed for the Astronauts—four of whom are Naval Aviators. At top are three inflated flotation bags.

NAVAL AVIATION NEWS

FORTY-FIRST YEAR OF PUBLICATION, MARCH 1960

■ IN THIS ISSUE

Navy's Space Role 6 — *First in a series of three articles on the Navy's place in the Space Age.*

U. S. Naval War College 13 — *A look at the Navy's highest institution of professional education, prepared by its staff members.*

Sense Pamphlet 18 — *Review of the latest of a renowned line, "Flight Simulator Sense."*

Exchange Pilots Abroad 20 — *A picture spread on U. S. Marine pilots serving a tour with the RAF in England.*

Pilots Play It Cool 23 — *An inside glimpse of the supporting systems of the Mark IV pressure suit.*

See It Now 30 — *Closed circuit TV of Ranger air-ops.*

New Rocket Engines 34 — *A down-to-earth report of pre-packaged rocket engines used in Bullpup and Sparrow III.*

Maintenance Speeded 37 — *Machines replace secretaries at Cherry Point's Maintenance Control Division.*

■ THE STAFF

Cdr. E. G. Colgan	Head, Aviation Periodicals Office
Cdr. George F. Rodgers	Editor
Izetta Winter Robb	Managing Editor
Lt. B. T. Sullivan, Joseph E. Oglesby, JOCS	Associate Editors
Cdr. Oliver Ortman, Cdr. G. L. Knight	Contributing Editors
Ardis Pitman	Secretary
James M. Springer	Art Director

Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, 10 Feb. 1959.

Published monthly by Chief of Naval Operations and Bureau of Naval Weapons to disseminate safety, training, maintenance, and technical data. Send mail to Naval Aviation News, Op 05A5, Navy Department, Washington 25, D. C. Office is located in room 5E629 Pentagon: Telephone Oxford 73685 or 73515. Annual subscription rate is $2.50 check or money order ($1.00 additional for foreign mailing) made payable to Superintendent of Documents, Government Printing Office, Washington 25, D. C. Single copy, $.25.

NAVAL AVIATION NEWS

Safest Quarter Recorded

Basic Holds Accident Rate to .84

Naval Air Basic Training Command compiled a record low accident rate in the quarter ending December 31.

In 94,899 flight hours, only eight aircraft accidents occurred. As a result, the accident rate of .84 per 10,000 hours flight bettered the previous low of 1.28 which was recorded in the first quarter of 1958.

In the record-setting quarter there were no fatalities. This beat the .05 deaths per 10,000 flight hours set in the third quarter of 1955 when one death occurred.

Total cost of aircraft accidents within the command dropped to $109,600 for a cost of $1.15 per flight hour. The past record, set in the first quarter of 1955, was $343,350 for a cost of $1.80 per flight hour.

In the last quarter of 1959, no aircraft received strike or overhaul damage. Previous low was eight, which was recorded in the third quarter of 1958.

Gold Rush at Sanford

Enlisted Men Don Ensign Stripes

It was a real gold rush for Heavy Attack Wing One personnel in January. Eleven men from the A3D squadrons put their enlisted uniforms in the closet that morning and donned the single gold stripe uniform of Ensign U.S. Navy.

Before the commissioning ceremony in his office, Capt. James D. Ramage, Commander Heavy Attack Wing One, said, "To my knowledge we have the highest percentage of officer selection of any major command in the Navy. It indicates the high quality of enlisted personnel serving in our heavy attack squadrons."

T. R. Walton, E. P. Szeyller, H. R. Ferguson, and E. A. Zak; all formerly of VAH-5, and E. D. Spidell and D. N. Varner, formerly of VAH-3, were sworn in by Capt. James D. Ramage in a ceremony in his office. A similar ceremony, taking place at Newport, Rhode Island, commissioned A. M. Campbell of VAH-5, R. Hite of VAH-9, K. M. Tourney of VAH-11 and C. R. Bone and J. Haisten, both formerly of VAH-3.

Each new officer must complete the officer indoctrination course at Newport before going to his next station.

Pacific Fleet Gets WF-2

Warning Plane Praised by VAW-11

The saucer-topped Grumman WF-2 *Tracer* became operational in the Pacific Fleet December 31 when the first one was received by VAW-11 at NAS NORTH ISLAND, San Diego.

The WF-2 will replace the AD-5W "Guppy" as the primary carrier based airborne early warning plane. It carries a crew of four.

The concept of airborne early warning was developed in WW II to meet the problems created by Kamikaze and other low level bombing attacks. By coming in just above the crest of ocean waves, enemy attackers could not be detected until they entered the short line-of-sight range of ship-board radar.

To extend the radar horizon, Navy researchers raised the radar's antenna by installing it in aircraft. The AD-5W was first used for AEW service in 1955.

The WF-2 is a modification of the TF-1 *Trader*. Suitable for all-weather operation, it is equipped with an 18-foot long-range antenna housed in the largest radome yet designed for a carrier based aircraft.

The plane's new tail assembly with twin fins and rudders reduces possible wake effects from the radome which is mounted above the fuselage.

Capt. Robert H. Mathew, Jr., commanding officer of VAW-11, says the WF-2 is "the greatest single advance in carrier-controlled early detection of enemy forces reached by the Navy in more than 15 years of development."

THE U.S. NAVY'S *top civilian leadership sat for this portrait: (left to right) Cecil P. Milne, Assistant Secretary of the Navy for Material; Fred A. Bantz, Under Secretary of the Navy; William B. Franke, SecNav; Richard Jackson, Assistant SecNav for Personnel and Reserve Forces; and James E. Wakelin, Jr., Assistant SecNav for Research and Development.*

GOING THIRD CLASS *are these 77 new petty officers massed on USS Yorktown's flight deck. Capt. Louis H. Bauer, ship's C.O., said: "You have shown by your educational pursuits, skill, and military bearing that you are qualified to assume petty officer responsibilities."*

AOCP Record Shattered

Moffett Goes Clean for 7 Weeks

NAS MOFFETT FIELD's supply department has set a Navy-wide record in zero AOCP rates for master jet stations, operating seven straight weeks with no aircraft out of commission for lack of spare parts.

This breaks all known records for Moffett's class of air station.

Since August 14, Moffett's supply department has recorded 11 zero AOCP weeks and has received eight honorable mention citations from the Navy Aviation Supply Office.

To receive honorable mention, a station must support an inventory of 100 or more aircraft and must have an AOCP rate of three percent or less.

More HU2K's are Bought

Will Become Operational in 1961

The Navy has awarded Kaman Aircraft Corporation a $14-million contract for additional production of HU2K-1 helicopters. The contract does not include special ground handling equipment, spares and handbooks.

Developed to meet the Navy's need for a high speed, all-weather helicopter, the HU2K-1 is designed to accomplish such missions as sea rescue, carrier plane guard, litter evacuation, transport of externally slung cargo, personnel transport, and observation-reconnaissance missions.

While the Navy does not presently plan antisubmarine uses for the HU2K-1, the helicopter does have ASW capability. It can carry both detection and attack equipment over useful distances for adequate times.

The HU2K-1, powered by a General Electric T-58 gas turbine engine, will carry the latest in automatic and electronic autopilot and navigation equipment.

Now in advanced testing and development at Bloomfield, Connecticut, the HU2K-1 is scheduled to go on duty at stations and on fleet units in 1961.

New Stabilizer is Tested

Will Improve ASW, Rescue Flight

A new system for stabilizing light helicopters is undergoing Navy tests. The automatic system, known as the Helicopter Stability Augmentation System, is expected to make light helicopters more practical in anti-submarine warfare and air-sea rescue operations as well as in instrument flight and landing on moving ships where precise control is necessary.

Stabilizing action produced by the system reduces the effort required by pilots in stabilizing their craft, thus reducing pilot fatigue and allowing more time for other essential flight functions.

The system weighs less than nine pounds. It is compact enough for use in small helicopters and uses rate gyroscopes (those which sense angular velocity) as its primary component.

Maximum reliability and minimum weight are made possible by the use of printed circuits, de-rated components, silicon transistors and diodes.

Space normally required by shock mounts is eliminated by the use of an amplifier mounted directly on the airframe, and control system push rods are replaced by actuators which can be installed in a variety of helicopters by employing a detachable end piece.

In flight tests with the Bell HTL-7 helicopter, less than half the control stick motion was required to hover with the system on. Pitch attitude was held more accurately with this decreased stick activity.

The system was developed by Autonetics, a division of North American Aviation, using specifications from the Airborne Instruments Laboratory.

Mugu Gets New Computer

709 Monitors Short, Long Flights

An IBM 709 electronic computer has been installed at the Pacific Missile Range, Point Mugu. It will enable the range safety officer to observe the position of a missile from the time of launch to impact.

The missile can be destroyed in flight within 1½ seconds after the huge computer reveals it is off course.

The computer will monitor flight paths ranging from those of short range missiles to intercontinental ballistic missiles which reach their impact point more than 5000 miles away in the Western Pacific.

Chief job of the new computer, said Cdr. F. P. Morrison, Range Development Officer, is to give missilemen a ready answer to the question "How are we doing?" while the test vehicle is in the air and after it has been landed.

Tarawa is Decommissioned

Landed 70,000 Planes in 11 Years

USS *Tarawa's* crew of 1400 officers and men bade farewell to Quonset Point in January as the support carrier got underway for Philadelphia and the Mothball Fleet.

She anchored off Norfolk to offload supplies en route to Philadelphia.

Tarawa's crewmen have dispersed throughout the fleet in new assignments.

The ship belongs to a proud line of aircraft carriers bearing the names of decisive battles in American history. Commissioned in December 1945, the *Tarawa's* name commemorated the Second Marine Division's battle for Betio Island, Tarawa Atoll, in 1943.

In 11 years of active service *Tarawa* recorded more than 70,000 arrested landings. She traveled approximately 444,000 miles.

The ship twice won Navy Battle Efficiency E's, in 1953-54 and 1957-58.

GRAMPAW PETTIBONE

Asleep at the Switch

About 0810 one bright and sunny morning, a division of FSU *Crusaders* returned to the field after completing an air-to-air gunnery hop. All planes broke upwind over the runway for practice mirror approaches, and all landings were normal except for that of one pilot who didn't like his angling approach and took a wave-off.

His second pass was right on all the way and a normal mirror landing was made. He commenced braking with 2500 feet of runway remaining and was down to taxi speed when suddenly the left wing dropped. The FSU slewed to the left and stopped as the main wheel and tire went rolling down the runway ahead of the aircraft.

Two ordnancemen ran out to the crippled FSU and shouted to the pilot that his wheel drum was on fire and fuel (actually hydraulic fluid) was leaking onto the fire. The pilot called the tower on his radio, shut down the engine and climbed out of the cockpit with considerable haste. He slipped and fell to the concrete, fracturing his heel, and lay there for a moment.

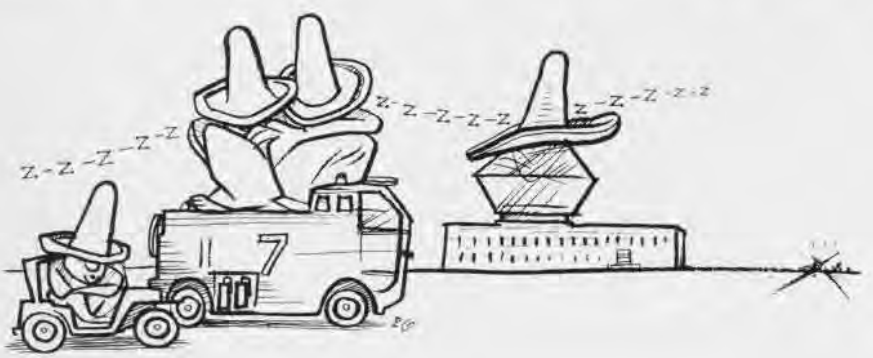
Being unable to walk, he first had the two ordnancemen help him away from the *Crusader* and then sent one in the ordnance jeep to get the crash trucks which were nowhere in sight.

Grampaw Pettibone says:

Jumpin' Jehosophat! This really twangs my burstin' blood vessels!

Ol' weak eyes in the tower should have SEEN the accident occur, especially with a loose wheel rollin' down the runway and a bent bird generally blocking things up, and he got a call-up besides. This place gets real warm and crash truck cabs get pretty uncomfortable, but the duty truck at the runway should have *somebody* watching the store!

Once a crash occurs, TIME is the main factor in saving lives and a mighty expensive aircraft! This same outfit had a wheels-up with no wheel-watch posted and a landing aircraft hit an unlighted mirror installation just off the edge of the runway. The Operations Officer better get with it. This was too early in the day for a siesta.



Wheels, Wheels, Wheels

An A4D pilot was returning to the home field one CAVU day after completion of the air work portion of his seventh daylight FAM hop. Upon arriving overhead, he received permission to make several simulated flame-out approaches to the duty runway.

The first SFO was carried down to 2500 feet with a wave-off because of traffic, the second to 2500 feet again and another wave-off. At this point the pilot requested clearance for the final landing. Cleared by the tower, he broke, descended to 1500 feet, dropped speed brakes, then flaps as he got below 170 knots downwind, braked in again, and called "All down" for landing.

He was a little fast on final and was just coming back on the throttle as he started to flare when he heard an unfamiliar voice yell "Wheels!" Too late! As he added full throttle, the A4D touched down (no drop tanks on her either). Throttle came around the horn, and it skidded out, straight down the runway at the wheels watch who was posted at the opposite (wrong, that is) end of the runway!

Grampaw Pettibone says:

Great horned toadies! The fog count was pretty high in both the cockpit and on the ground this fine day. Gramps has no tears for the pilot since he goofed with a capitol G. The wheel watch fiasco jest knocked your ol' Dad for a loop or two.

Seems the wheels watch was posted at 0930 on runway 24R, complete with paddles and flare guns, then because of a 180° wind shift at 0940, the duty runway was changed to 6L. The lad on duty asked the tower by field telephone if the watch should shift too. The tower told him to wait, they'd check.

Two hours and 47 minutes later, the A4D became a statistic! The watch was conscientiously checking wheels, spotted 8000 feet down the runway and admitted it was a lot harder from THAT position! Man-O-Man, when this particular outfit posts a watch, they practically set both his feet in concrete.

Yakety-Yak

An experienced pilot with over 400 hours in the A4D had just completed a climb to 40,000 feet during the course of an acceptance test of a newly received A4D-2. During the climb he had established radio contact with a nearby GCI unit to check out the electronic gear, and as he leveled off at 40,000, a turn was commenced to insure positive radar identification.

Suddenly the pilot was startled by a muffled explosion, followed by a rise in tailpipe temperature to 900°C, the maximum temperature! He retarded the throttle to idle, told radar of his trouble, and switched to GUARD channel. Since the TPT remained pegged, he shut down the engine, dropped out the emergency generator, and set up a glide for a nearby desert airfield, contacted the field tower and gave a series of position reports, instrument readings and action he planned to take.

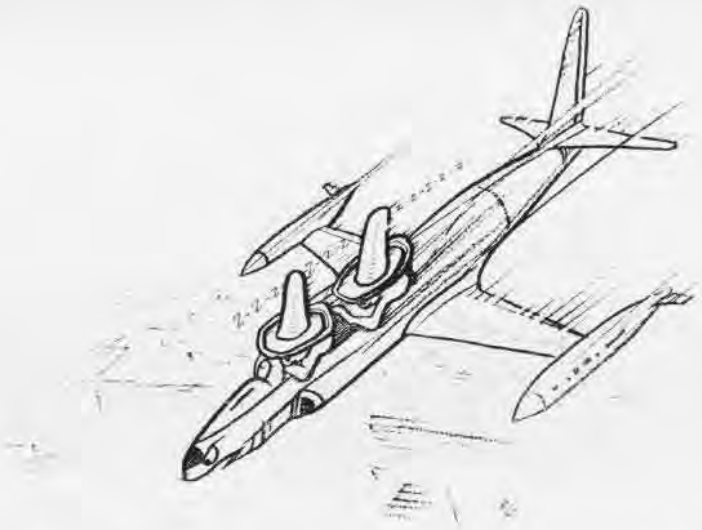
When he arrived over the field at 27,000 feet, airstart attempts were made in both primary and manual fuel systems, but both light-offs resulted in 900° TPT readings and the RPM would not accelerate beyond idle. The last attempt was made at 9000 feet. Stop-cocking the engine, the pilot notified GCI and the airfield that he was going to eject immediately.

At this time the airfield tower came on the air requesting the pilot's position, base of origin for the flight, and bureau number. Although rapidly approaching critical ejection altitude, the pilot responded with the information requested. On learning his position was near a local target area, the tower again called and told him to clear the area since the targets were in use! The pilot calmly informed the tower he was unable to comply and asked that the target pattern aircraft be cleared instead. Upon receiving the tower "Roger," he reported his altitude as 5300 feet and ejected. The ejection was successful with all equipment functioning properly, including the zero delay lanyard, which was installed. He was subsequently recovered safely by men of the target crew.

Grampaw Pettibone says:

Sufferin' catfish! When a man has his hand on the curtain and is down to GO-GO-GO altitude, that's sure no time to start yakety-yaking with him as this tower did. As far as the aircraft in the target area are concerned—with radio gear set properly they should have heard all the traffic on GUARD channel and been clear of the target area without being ordered to do so.

Ol' Gramps can't picture any pilot going ahead with bombing or rocket runs on a routine basis when about six tons of metal coming down out of the blue overhead. I'd of had that lad in sight or been heading out of there pronto! Radio discipline is a mandatory requirement. COMMON SENSE is what makes it possible.



Who's Got It

Two fighter pilots in a TV-2 at 34,000 feet were engaged in a combination fam/instrument hop, actually a solo check for the front seat pilot.

After some routine air work, the pilot up front asked for a check-out on acrobatics in the TV-2. The check pilot agreed and proceeded to explain the air speeds needed for various maneuvers. As he talked, the plane nosed over and began a steep descent. Noting the airspeed passing .8 Mach, the check pilot, who was not flying the TV, took the controls, cut the power, dropped the speed brake and eased it back to level flight.

Since there had been considerable vibration and buzz on the pull-out, both pilots checked the wings visually. Everything seemed normal so they continued the hop. Several barrel rolls and a loop later, the check pilot discovered a bad wrinkle in the port aileron and an immediate penetration and landing were safely effected.

As they were taxiing in to the line, the check pilot remarked that he was sorry he had not briefed on the limiting Mach of the TV-2, especially after that high speed let-down the front seat pilot had made, perhaps understandable, since the front seat man was used to the tremendous speeds of the F8U. The front seat pilot replied that he was aware of the TV-2 limitations, but he wasn't flying it at the time and thought the instructor was just gaining speed for a loop. In consternation, they realized no one had it!

Grampaw Pettibone says:

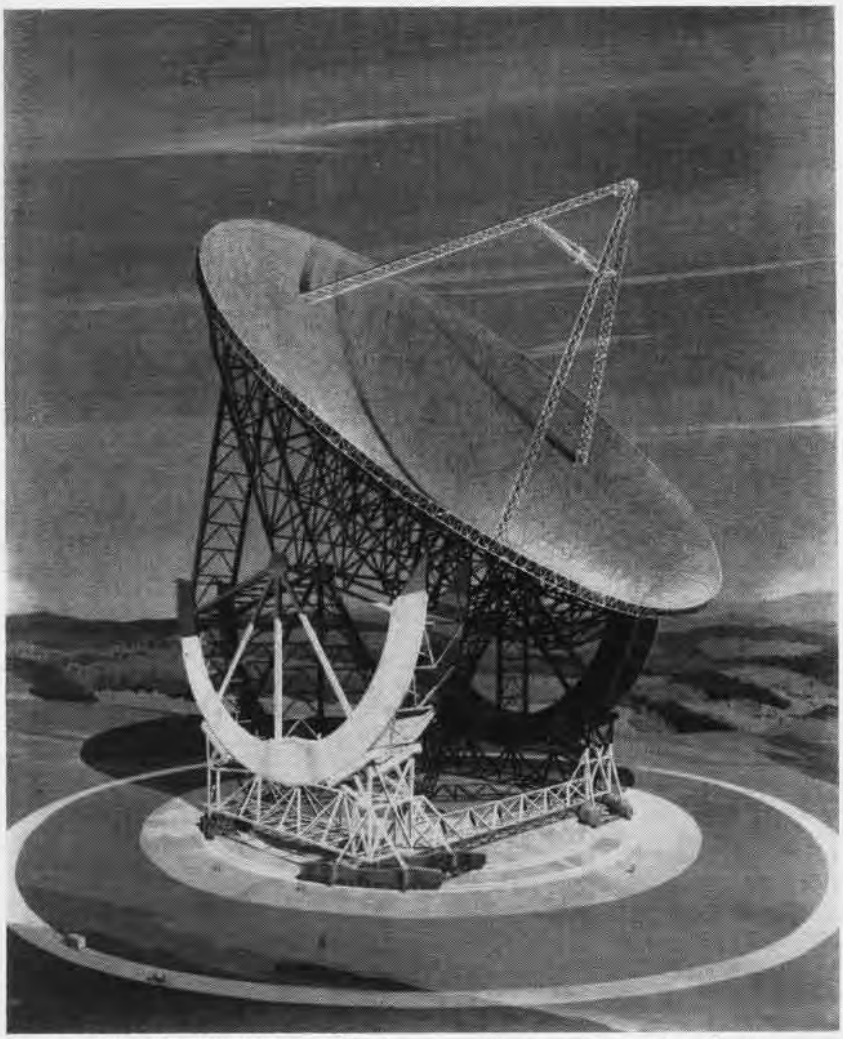
Here's a couple of normally savvy pilots completely disregarding the normal procedures for passing control in an aircraft. Ol' Gramps jumped on these lads because theirs was not an isolated case and they were real handy.

We've had a copilot, without being told to do it, flip up the gear before the plane was airborne. In another case, passengers told the copilot what to do in an emergency without the pilot gettin' a chance to decide.

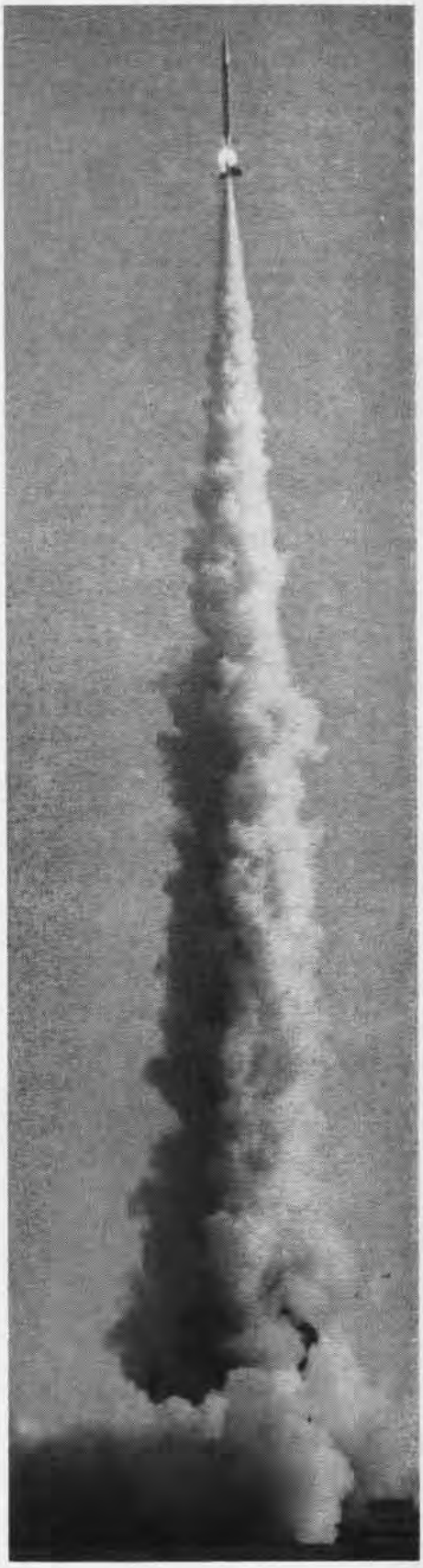
When you sign that yellow sheet and clearance, you've effectively bought the aircraft, and it's your responsibility until you return it to its legal custodian. If it's damaged or an infraction of flight rules takes place while you've got it, you just have to be prepared to tell a plausible story. Before you take the runway you better have a clear understanding of who's gonna do what and on what signal.

OPNAV Instruction 3710.7A, Section 3, tells how it MUST be done. Every man flying a dual control machine should review the instructions, especially if he's normally pushin' fighters up there. It could save your bacon.

NAVY'S SPACE ROLE



STRIKINGLY SYMBOLIC *of Navy's space role is gigantic radio telescope being erected near Sugar Grove, W. Va. "Dish" is 600 feet in diameter.*



"The true naval benefit from astronautics will be in being able to carry out old and continuing tasks on the earth's surface better than before."

—VAdm. R. B. Pirie, DCNO(Air)

IN A SERIES of three articles entitled "SPACE—MYSTERY AND MASTERY" which appeared in preceding issues of Naval Aviation News there was presented a technical introduction to space. The ground rules for operating in the new environment were spelled out: laws of motion; velocities required for escape from earth's gravity and orbital flight; and some aspects of manned venture into the near-vacuum of the outer regions.

The military implications resulting from U.S. and Soviet achievements in space technology are numerous. In view of the incredible progress being made, most prophets become historians. As an example, the "if" aspect of a lunar probe became "now" while this article was in preparation. So it may be with the projection of Naval requirements in the following. We may touch on future needs which have already been resolved.

Still to come are manned satellites, maneuverable spacecraft, lunar exploration, and eventually according to one schedule of objectives, human planetary exploration. The effects of these accomplishments on a future fleet commander are, at this early date, largely a matter of guess and conjecture. Of one thing the Navy is certain: its mission will still be control of the oceans that comprise three-quarters of the earth's surface.

ALL SHIPS AT SEA, *surface and sub-surface, will benefit once Navy Project Transit is operational. By use of signals emitted from orbiting satellites, extremely accurate navigational fixes will be readily attainable.*

PART I

NAVY PREOCCUPATION with space matters is widespread and varied. It might be recognized in the California desert where a standard carrier-based jet was rigged to air-launch a satellite into orbit; or at Dahlgren, Virginia, where Navy personnel are now engaged in a unique space age traffic count of all satellites passing over the United States.

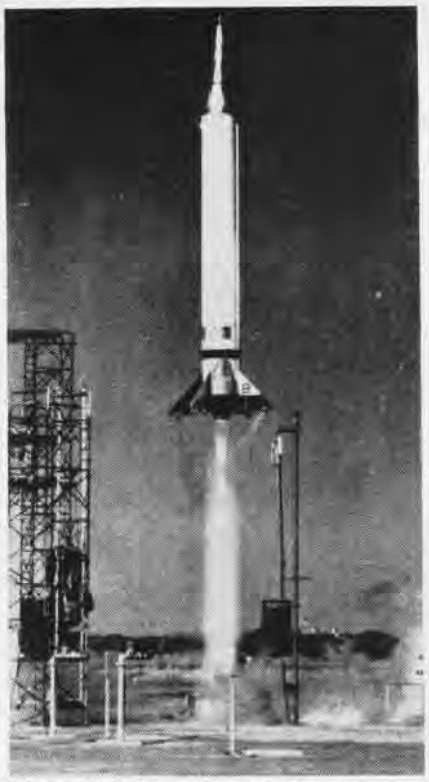
It is apparent elsewhere at places like Pensacola and Bethesda, Maryland, where Navy scientists ponder the cause and effect of varied environments on man: extreme quiet, terror of loneliness, unconventional surroundings, threat of danger from unknown sources. One study is even programmed to develop ways to "suspend animation" in a human being and then revive him.

In other places, other projects having to do with astronautics and bio-astronautics include a navigation satellite, a vast missile range, a radar moon relay, a space suit and participation in the recovery of capsules.

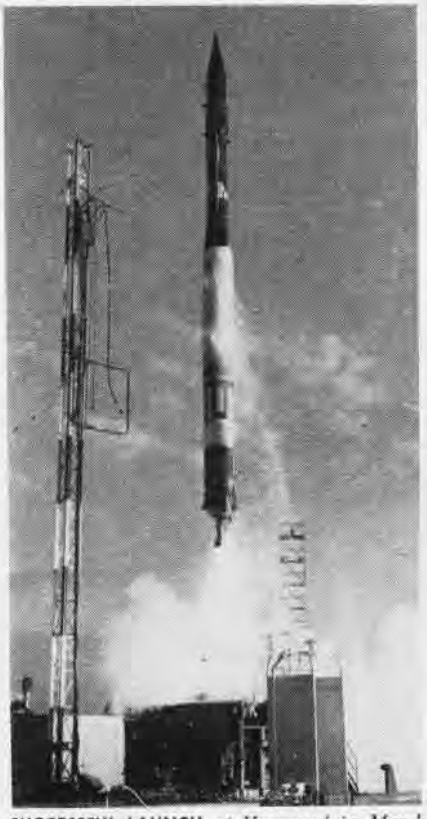
It may be noted too in the Navy's Bureaus and in its Fleet staffs where newly lettered door signs bearing the word "Astronautics" point up a major change in the Naval Establishment.

This involvement with space considerations is not of recent vintage. The acceptance of its first submarine in the halcyon days of 1910 afforded the Navy its first opportunity to gain insight into the behavior of men cooped-up in a confined, capsule-like, metal shell. Significantly, the scientific observations of submariner reactions and requirements over the past 50 years comprise a useful reference for human engineers today in their continuing search for man/machine harmony.

The story of other periods in Naval history which bear a marked similiarity to the present is one of continuing change brought about by ever advancing technology. The steady progress from sail to steam to nuclear power spanned nearly 200 years and made essential a continuing concern in research and development. As a matter of historical interest, the first submarine plunged into the depths in 1777. A useful torpedo was devised in 1804. Steam as a means of propelling a warship was demonstrated in 1814; accepted by the Navy in 1841 with the commissioning of the USS *Mississippi*.



VIKING #9, *Navy high altitude rocket, starts 1952 climb to record height of 135 miles.*



SUCCESSFUL LAUNCH *of Vanguard in March 1958 marked a major space achievement.*

In 1862 the first iron vessel with revolving turrets, the *Monitor*, was launched, and the wooden warship became a thing of the past. Twenty years later, the first ships of a new Navy were made of a new substance called steel. Electricity made its debut in 1883 on the *Trenton*. Armor plate, 6000 tons of it, was contracted for in 1887 for the battleships *Maine* and *Texas*.

Lt. Bradley Fiske in 1888 (some years before Marconi) experimented with wireless telegraphy on board a naval ship. In 1904, 24 ships and 20 shore stations of the Navy were equipped with "wireless." And three years later, radio telephone use on board a ship was achieved.

The Wright Brothers flew for the first time in 1903, and seven years later, Eugene Ely piloted an aeroplane from the deck of the cruiser *Birmingham* to Willoughby Spit, Virginia—a distance of two miles.

The year 1911 marked the launching of a diesel-powered submarine and the Navy order for its first airplane. Navy use of airborne radio equipment followed shortly thereafter.

The world's largest wind tunnel at that time was added to the facilities of the Naval Model Basin in 1914 while elsewhere study was begun in the new fields of aviation medicine.

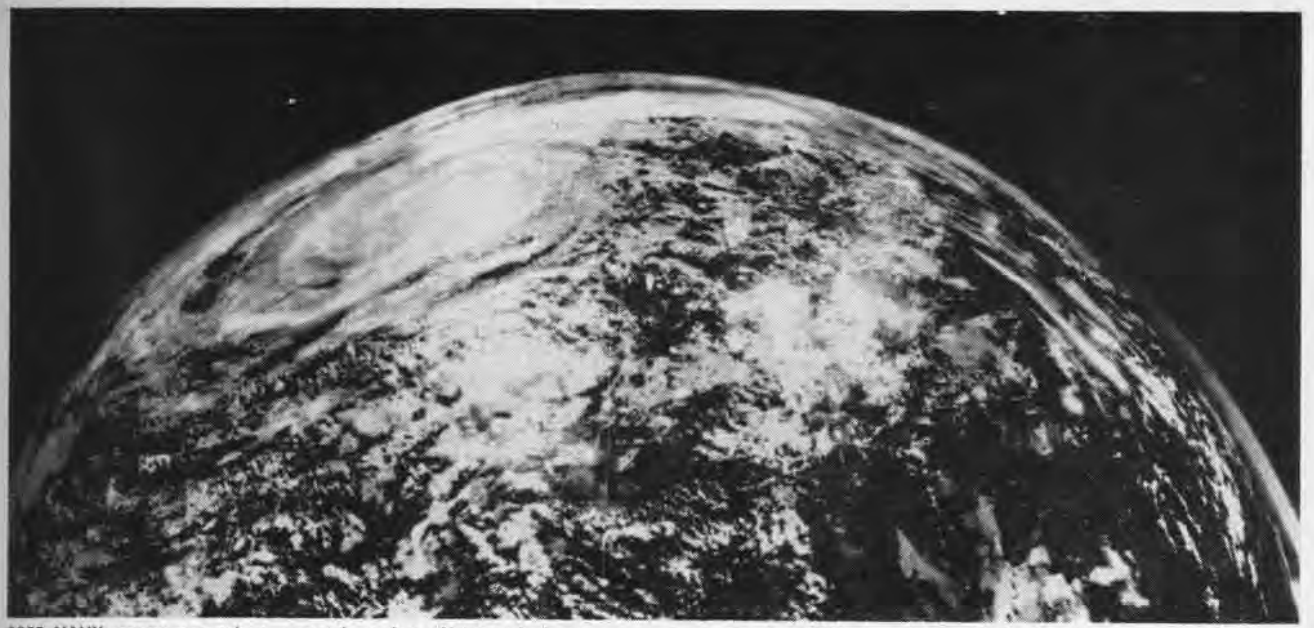
The radio range made its appearance in 1918 and in that year, flight refueling was first demonstrated by Lt. G. L. Cabot, USN.

In 1922 the first Navy all-welded ship, a fleet tug, was launched at Norfolk. Near Washington, Dr. A. Hoyt Taylor and L. C. Young of the Naval Aircraft Radio Laboratory (one of the forerunners of the Naval Research Laboratory) discovered the reflection of radio waves from moving ships. Their discovery eventually led to the development of radar by the Naval Research Laboratory.

In 1934 all-welded warships were introduced, and the first aircraft carrier designed as such, the *Ranger*, was placed in commission.

The last half of the 1930's gave us pulse radar, the high speed computer, sonar, IFF, a demonstration of UHF and the beginning of Naval research in atomic energy and nuclear physics.

During the war years, jet assisted take-off made its appearance. Oper-



1955 NAVY *upper atmosphere research rocket photographed approximately one and one-quarter million square miles of earth shown in this composite view. White area (upper left) is hurricane near Del Rio, Texas. Entire Lone Star state plus parts of nine others can be identified.*

ational radar arrived in the fleet in quantity as did radar countermeasures, intercept receivers and jammers.

In 1943 the first guided missile was employed in the war. It was a small drone carrying a 2000-pound bomb. In the same period the Naval Ordnance Laboratory developed a magnetic airborne detector.

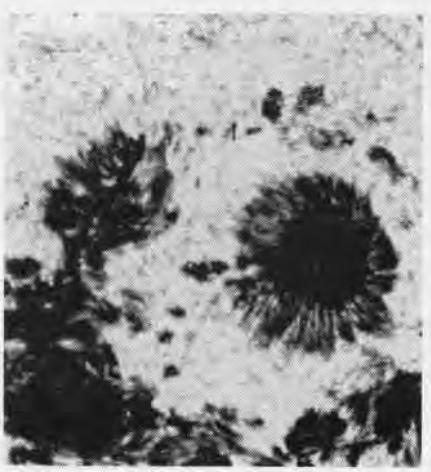
Toward the end of the war years, newer landing ship development, a radio circuit using single side-band technique, and the operational employment of the guided missile *Bat* were revealed. The only aerial homing missile used in WW II, the *Bat* was launched from naval aircraft against enemy shipping in Balikpapan Harbor, Borneo.

The first jet landings and take-offs on a carrier were made in 1946. About this time upper atmosphere research was enhanced by the development of new plastic balloons. The nature of primary cosmic radiation was discovered shortly afterwards with the use of instruments carried aloft in these balloons.

From these years of considerable scientific achievement, other legacies of Naval development included the radial engine, steam turbine, aircraft rockets, the VT fuze and a major role in the atomic bomb project.

These events in Naval history through 1946 are a few of the technological milestones which have had considerable effect of the Navy's handling of its traditional primary mission—control of the world's oceans. Propulsion, communications, ordnance, delivery means and methods—each advance has shaped new requirements and new considerations. Today the military implications which are drawn from the burgeoning science of Astronautics are such that the Navy is once again immersed in new technologies. Patently, the Navy's inherent capabilities—mobility, flexibility, stealth, global surprise, strategic impact—afford singular readiness for application of space equipments and space concepts.

If there is a beginning to the Navy's story in astronautics, it might be considered as having started on 17 December 1945 with the official designation of the Rocket-Sonde Research Branch of the Naval Research Laboratory. A little more than three years after its commissioning, the small unit succeeded in launching the first all-U.S.-built upper atmosphere research rocket, *Viking 1*, from White Sands, New Mexico. Thus was the stage set for a national space program which today strains the imagination in its scope and magnitude.



ONR BALLOON *project involved sun study. Black spots are gas cores in magnetic fields.*

The *Viking* series of launches—12 in all—provided a great deal of knowledge of upper-atmosphere phenomena. Radio telemetry equipment designed by the NRL unit made possible the measurement of high atmosphere pressure, density, composition and wind motion. The nature of the ionosphere, its ion and electron content, was measured and studied. The "placid" stratosphere was found to be turbulent, with wind velocities of 180 mph measured at an altitude of 125 miles. X-rays discovered by means of *Viking*-borne detectors are now considered one of the major producers of the ionosphere. Ultra-violet radiation from the sun was observed in detail and the layer of ozone it produces accurately measured during the shots.

Many of the design features of the *Viking* were carried over to later rocket designs. The most significant

BALLOON-ROCKET *combination in project Rockoon achieved significant scientific results.*

was the development of the gimbaled or "swivable" rocket engine. This development was a radical departure from the V-2 and Redstone designs and has been the key to all the major U.S. liquid propellant rocket engine designs used in the ballistic missile and space programs.

Other significant results of this pioneer Navy undertaking in astronautics were the highest exposure of cosmic-ray emulsions and the highest altitude photographs of the "water planet," earth.

The feasibility of a shipboard rocket launch, first demonstrated by the Navy on the USS *Midway* in 1947 with a modified German V-2 bombardment rocket, was dramatically affirmed with *Viking 4* on 11 May 1950 aboard the USS *Norton Sound*. Carrying a payload of 959 pounds, the pencil-thin predecessor of *Vanguard* boomed to a height of 105 miles, a record for sea-launched vehicles which stood for over seven years.

From this epic beginning to the present day of ballistic missiles, weather reconnaissance rockets and man-made satellites, some singular contributions have been made to national astronautic programs by Naval scientists and research agencies.

In the wake of the *Vikings*, some of the better known Navy programs included *Aerobee* and *Aerobee-Hi*, *Orbiter*, the *Skyhook* series of research vehicles and IGY Project *Vanguard*.

In the *Aerobee* project, vertical sounding rockets, some of them sea-launched, were sent to investigate areas 100 miles or more above the earth. Coupled with *Aerobee-Hi*, a later version which reached altitudes of 200 miles, the rockets served as vehicles for rocket photography, instrumented payloads and aero-medical projects during a series of 20 firings.

Navy planning in this period, which might be called prophetic in view of present accomplishments, involved the development proposal of an earth satellite vehicle to orbit 100 to 1000 miles above the earth. After a two-year effort, the Bureau of Aeronautics plan was discarded because of budgetary reasons.

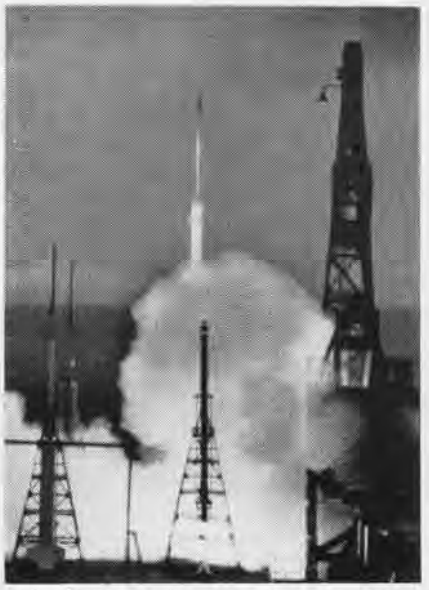
A similar project for placing a satellite in orbit was started jointly with the Army in 1954. Navy participation in this project was terminated with the Navy's selection for management of *Vanguard*.

In these early stages of the U.S. space age, the Navy continued its rigorous efforts to perfect rocket astronomy and rocket photography. Both programs have resulted in a better understanding of earth and our solar system. Two Navy projects, *Hugo* and *Arcas*, established an operational capability to obtain photographs of clouds for weather forecasting and to gauge temperature, density and wind velocity and direction in the upper atmosphere.

Project *Argus*, a DOD program conducted aboard the U.S. Navy experimental missile ship, *USS Norton Sound* in August and September 1958, tested scientific theories about earth's magnetic field. Three test vehicles, each carrying low-yield atomic bombs, were launched to heights of 300 miles successfully. The program increased our basic knowledge of outer space and pointed up other high altitude effects of military interest.

Concurrent with its programs of space exploration by means of rockets and probes, the Navy has conducted numerous experiments using high altitude plastic balloons to obtain information which is of highly significant use in current space undertakings.

In *Stratolab*, one manned balloon flight reached an altitude of 85,700 feet, gathering important atmospheric data which will have applications to our missile systems of the future. Future *Stratolab* flights are expected



FROM SHIP, *rocket starts for outer space. Argus sea shots reached 300-mile heights.*

to obtain data on space charge measurements, cloud structure and tests of artificial cloud nucleation. In general, the Navy balloon projects provide a stable stratospheric laboratory for studies in astronomy, aeromedicine, aerology, cosmic rays, atmospheric physics, asthrophysics, geophysics and military science. At present these are the major means of conducting this type of research.

Project *Rockoon* augmented the altitude potential of a *Skyhook* balloon with a rocket to achieve record-high space probing. In this undertaking, small *Deacon* rockets were lifted to about 70,000 feet and then automatically fired over Arctic waters. This particular series of experiments contributed to Dr. James Van Allen's discovery of heavy radiation belts hundreds of miles above the earth. The discovery re-channeled the thinking of scientists concerning man-in-space and generated the investigation of radiation protective measures.

These events, beginning with *Viking*, paved the way for the selection of a Navy team to manage the nation's International Geophysical Year project *Vanguard*. The scientific satellite which was based on a promising proposal using original, non-military components, was launched successfully 17 March 1958 following a number of well-publicized disappointments. Subsequently two other *Vanguard* satel-

lites were placed in orbit, each carrying significant original experiments.

The total cost of the *Vanguard* program is today regarded as money well spent; the project a highly successful development. Engines used in *Vanguard* now power the upper stages of the *Atlas Able, Thor Able* and *Delta* rockets. Minitrack equipment originated for tracking the *Vanguard* satellite now is the heart of the national space surveillance system. Since *Vanguard* was completely experimental, embodying totally new components, space technology was enriched with new knowledge of design, launching and tracking features, equipments and procedures.

This, in a general way, is where the Navy has been in space since the *Viking I* launch. Since October 1957, a number of man-made satellites have been placed in orbit in our solar system. Of these, nine satellites with lifetimes ranging from 15 months to 2000 years remain in orbit around the earth or moon while two with infinite lifetimes are believed to be in orbit around the sun.

The scientific payloads of these unmanned space vehicles range from 3.3 pounds (*Vanguard I*) to 3245 pounds (*Soviet Mechta*). One of them (*Score*) beamed a Christmas greeting from outer space; another (*Lunik III*) recorded and then transmitted to earth a picture of the dark side of the moon. Two others launched by the U.S., the *Pioneer* and *Explorer* satellites, fixed and fed back information which aided the discovery of enormous areas of radiation above our atmosphere —the Van Allen belts at levels of 2000 and 30,000 miles above the earth.

On space age drawing boards of the nation, future astronautical undertakings of the late 1960's will involve payloads of 150,000 pounds, take-off thrust in the order of 6,000,000 pounds or 200 times greater than the power packages which rocketed the first *Vanguard* into its 2000-year orbit. A project of this nature is expected to make possible the "soft" landing of a man on the moon and his safe return to earth.

The successful launching of the *Sputniks* invited Navy consideration of space aspects from another angle. Unopposed enemy capability in the use of military astronautic devices presented a serious challenge to U.S. security and to U.S. freedom of the seas and Naval lines on communication.

The impact of such space age considerations are apparent in a new Navy Department re-organization, future requirements and in the intensive research and development programs being conducted singly and jointly in the over-all national space venture.

As is the case with other technological advances in history, the attainment of a purely scientific objective, such as artificial satellite investigation of the solar system, carries with it certain military implications. The unmanned device which can observe, remember and transmit information presages increased military advantage to the user. Even in this very early stage of the art, singular advances in methods of early warning, communication, navigation and weather forecasting are possible.

As evidenced by this recital of past events and the shaping of its organization for future events resulting from space technology, Naval interest is directed along both scientific and military lines. The nature of this interest was expressed recently by RAdm. K. S. Masterson, ACNO (Development): "It is the Navy's belief that space exploration, space applications and the requirements for the utilization of space are, in the main, a national effort. Our conclusions are derived from three points of view.

"First, the now foreseen uses of spaces do not describe sharply defined roles and missions that are uniquely Army, Navy, Air Force, or civilian; secondly, the vast cost of most of the space programs and projects contemplated will demand that few, perhaps only one, system of a type be developed. And lastly, the successful execution of most space programs will demand all of the unique skills of the various services and civilian agencies to insure success." *(To be continued)*

NAVAL RESEARCH LABORATORY, *established in 1923, is a key agency in Navy space undertakings. In first 15 years, NRL provided Fleet with radar, improved sub-detection gear and finest radio communications. The Laboratory led off U.S. space effort with Viking; later managed Vanguard.*

DEEP IN THE HEART OF KWAJ

TRADITIONALLY, it takes a Texan to spin a good yarn and this one sponsored by Cdr. Ben R. Tate, Jr., who hails from New Braunfels, Texas, can stand a bit of re-telling. It concerns an emergency compounded by difficulties and some valuable help from a civilian (Texans, naturally) crew.

Tate, skipper of VP-42 with his co-pilot, Ltjg. Wendell S. Kuhn, was on the second leg of a long haul from Sangley Point, P. I. to San Diego in a Martin P5M-1 when the port engine of the big seaplane gave out.

After applying in-flight emergency procedures, Tate notified Kwajalein, still some 675 miles ahead, of his condition and of his intended arrival after sunset. Owing to the abundance of coral in the Kwajalein area, night landings were forbidden except, as in Tate's case, in an emergency.

At Kwajalein, a civilian team, properly known as the Transportation Company of Texas, under the supervision of Mr. Jack Fink, set about to make ready for the arrival of their compatriot in the stricken seaplane.

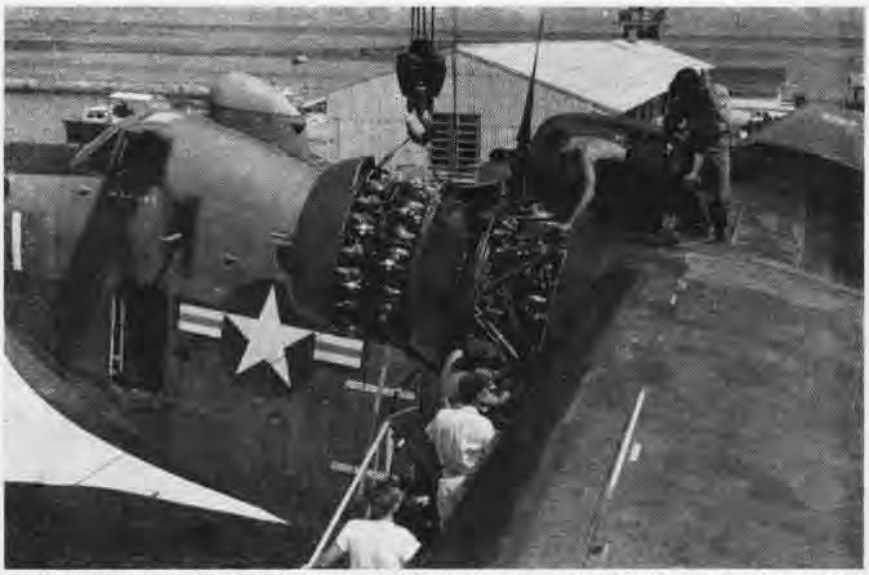
(The Company is under government contract and administered by the Navy to support military services which come in contact with Kwajalein.)

Placing ten high-intensity, long-burning smoke lights in the outer lagoon, the Texas Company crew created a sealane for the P5M, and a safe night landing was made without further incident.

The following day, the plane was towed tailfirst into the inner lagoon by two aircraft rescue boats where new problems arose to stymie the check of the port engine. Maneuvering the 55,000-pound *Marlin* to the ramp at the seawall and then towing it onto the ramp for beaching was a new one to island personnel. No large seaplane had been ramped at Kwajalein since the end of WW II.

Fortunately, the ramp had been modified the previous week to accommodate large seaplanes by cutting two large slots in the seawall to allow passage of the plane's floats during the ramping.

After three unsuccessful attempts to get the plane into position at the ramp with the power of the only two boats available, a long line was attached to the starboard wing and Navy personnel and civilians ashore furnished the additional power necessary to maneuver the plane into position for ramping. The beaching project was further complicated by the necessity for waiting for high tide in the late afternoon in order to attach the beaching gear in the inner lagoon. Once on the ramp, a tractor towed the plane onto the beach.



CREW MEMBERS OF VP-42 INSTALL A COMPLETE ENGINE ASSEMBLY IN THEIR P5M MARLIN

After beaching, it was found that a complete engine change was necessary and Fleet Air Hawaii at Barber's Point was contacted by dispatch. Within 24 hours, Fleet Aircraft Service Squadron 117, also at Hawaii, had a plane enroute to Kwajalein with a complete engine assembly and a Navy aviation machinist mate to assist in the work.

It took eight days to replace the engine and to ready the plane for testing. In preparing the *Marlin* for the test flight, another incident occurred which nearly damaged the plane. The tail line broke at the crucial moment of launching from the ramp.

A successful four-hour flight the first day, followed by another two-hour flight the next, indicated the engine was operating properly and the flight to San Diego was resumed.

There are several object lessons in this: skilled piloting, sound emergency procedures, teamwork and professional assistance. Also, wherever in this world you alight in that flying machine pardner, be gentle when you speak of Texas—you never know!

U. S. Naval Weather Service

Headquarters to be at Anacostia

On 15 January, a new field activity, the Office of the U.S. Naval Weather Services, was established. Its mission is to provide meteorological and related information, aid and advice to all activities of the Naval Establishment.

The new office also assists the Chief of Naval Operations in exercising management control of Weather Centrals and Weather Facilities. It exercises technical direction of all components of the U.S. Naval Weather Service.

Among other duties are those relating to increasing the operational readiness of the weather service, conducting technical inspections as required, and collaborating with other activities to insure that meteorological equipment and techniques are developed along with the systems they support.

The Office of the U.S. Naval Weather Service is a tenant activity of the U.S. Naval Station, Washington, D. C. and is under the military command of the Commandant, the Potomac River Naval Command. There will continue to be a Weather Service Division in Naval Operations (09B7) to provide certain staff functions for the CNO.

HIGH ON A HILL, THE STATELY NAVAL WAR COLLEGE BUILDING COMMANDS AN IMPRESSIVE VIEW OF NARRAGANSETT BAY ENTRANCE

U. S. NAVAL WAR COLLEGE

In October, 1959, the U. S. Naval War College, Newport, celebrated its 75th year of service to the cause of higher education in the Navy by unveiling to the public a marvelous electronic brainchild, the Navy Electronic Warfare Simulator, called simply NEWS. At its dedication, VAdm. Stuart H. Ingersoll, President of the War College, stated that the NEWS culminated over 13 years of effort.

NEWS needs a building one block long and three stories high to house the flag plot, air tactical command centers, umpire plots, communications centers, 20 individual command centers, and the allied equipment necessary to accommodate the tremendous variables in modern weapons systems performance. A war game can be laid out on an exact replica of any part of the earth, the space above it, or the seas beneath it—varying from 40 to 4,000 miles on a side. With a speed range of 0 to 5,000 knots, a drifting ice island or an ICBM, a nuclear submarine assault or a major fleet strike, can be wargamed.

Here today's fleet commanders—or more important, future fleet and force commanders—can observe and carefully evaluate a realistic wartime situation as it develops, controlling their forces, weapons, missiles and aircraft with all the skill required at sea, making decisions with the speed, if not the tension, of combat, and testing the soundness of their plans under conditions simulating war operations with startling accuracy. Electronically computed damage assessment is instantaneously available as a true check.

'NEWS', AN INTRICATE, FLEXIBLE AND UNIQUE WARGAMER, WAS UNVEILED LAST OCTOBER

RADM. STEPHEN B. LUCE WAS THE FOUNDER

PERIODIC READING ROOM OF THE MAHAN LIBRARY IS HIGHLY CONDUCIVE TO STUDY

THIS MARRIAGE of education in the classical sense with ultra-modern electronics did not happen by chance at the Naval War College. The art of war gaming was a part of the course at the War College in its beginning years, as well as today in its seventy-sixth year. It is believed that the Naval War College was the first institution at which war gaming was introduced as an academic art in the United States. The NEWS thus represents the application of our nation's most up-to-date scientific methods to an ancient art. War gaming techniques, however, are only one of the many great contributions of the War College to the Navy.

The Naval War College was founded on Coaster's Harbor Island in Narragansett Bay on October 6, 1884 by Rear Admiral Stephen B. Luce. The inspiration behind the idea of founding a college to teach senior naval officers the art of war was conceived many years before, in fact in the Civil War years. The purpose expressed at that time was simply, "to prepare officers of the Navy for higher command." That statement very nearly covers today's mission of the College, with the addition of the phrase "and duty on major joint and combined staffs."

Virtually every American knows about General Sherman's famous "March to the Sea" late in the Civil War. Few historians, however, know that General Sherman conferred with a young naval officer on how to protect the Army flank as it turned northward along the Georgia coast. The young officer was Lieutenant Commander Stephen B. Luce, who commanded the monitor *Pontiac* during the bombardment of Charleston, S. C. General Sherman commented on the fact that the Navy had been hammering away at Charleston for three years without strategic results. He indicated that he proposed to capture Columbia, cut off Charleston's line of supplies after which the big seaport would fall to the Navy "like a ripe pear."

Subsequent events occurred as predicted by the General. The incident impressed on the young naval officer the fact that basic strategic principles apply equally to land and sea operations. As a result, the future admiral became convinced that the Navy should have a place of learning where the art of war could be studied in its broadest aspects. Luce thereafter devoted his life to reforming the Navy system of higher education, but it was many years before he could rally enough support in the Navy Department to establish the college he visualized. However, the Industrial Revolution in America and the change from sail to steam opened broad new vistas for the Navy. In 1884 the Secretary of the Navy approved the founding of the War College.

On the original staff was Captain Alfred Thayer Mahan, soon to become the world-famed expert on sea power

VADM. S. H. INGERSOLL, PRESIDENT

A 1920 graduate of the Naval Academy, VAdm. Ingersoll has had a distinguished career. He received his wings at Pensacola in 1926, and served in USS Lexington, Langley and Yorktown, and also played a major role in the development of arresting gear.

In 1941, he served with TF-24 and later commanded NAS Anacostia and USS Monterey. After WW II, he was Commandant of the Naval Academy, ACNO (Plans, Policy and Operations), and ComCarDiv 4. Prior to his current duty, he headed the Seventh Fleet and the Taiwan Defense Command.

VAdm. Ingersoll has been awarded the Navy Cross, the Distinguished Service Medal and the Legion of Merit with Gold Star. ☆☆☆

MARINE, NAVY, ARMY MEN START THE DAY

and the greatest naval philosopher-historian America has ever produced. Mahan's early books were compilations of his lectures at the War College and the great majority of his works were produced during his studies there. Other brilliant men were also included on the early staff. Among them were Army Captain Tasker H. Bliss, who later became the Chief of Staff of the U. S. Army, and Professor John C. Soley who became Assistant Secretary of the Navy under President Theodore Roosevelt.

The value of the Naval War College was soon tested in the crucible of war. From 1895 the College had been studying a plan of operations to cover contingencies which might arise in the Caribbean area in event of difficulties with Spain. When the emergency occurred in 1898 our planners in Washington adopted the War College concept as the basis of our campaign. It was the only plan which had been carefully worked out, and it proved the worth of the War College.

From the earliest days, the Naval War College staff has been the major source in the Navy to develop long range strategic concepts on the mission of the Navy and advanced thinking on land, sea, and air power and their roles in future national strategy. It was very largely because of the advanced studies of the staff that the prestige of the War College was established. Principles of responsibility for combat and support functions inspired by Admirals Luce, Taylor and Sims directly influenced the reorganization of the Navy Department into its present structure which has functioned effectively through three wars without major change. The War College, as early as 1913, in fact, recommended the establishment of a National Security Council which Congress enacted into law 34 years later in the National Security Act of 1947.

Through the years, the Naval War College's mission of preparing officers for higher command remained unchanged, but its influence upon the strategic thinking of the Navy continued to broaden. In 1908 a major controversy over the mission, and hence the design, of future capital ships created a furor in the Navy which was settled in a conference at the War College presided over by the President of the United States, Theodore Roosevelt.

Following World War I, Admiral William S. Sims assumed leadership over the College and proceeded vigorously with a "new look" pointed toward a substantial increase in the size of the War College and in its influence and prestige over the post war Navy. In succeeding years the Navy Department relied more and more on the War College for work which is now accomplished by the War Plans Division of the Office of Chief of Naval Operations. By the early thirties, "War College doctrine" was widely held throughout the Navy.

Fleet problems were conceived, developed and evaluated here. It can now be revealed that in the *Orange Plan* developed at the War College in the 1930's, the sneak attack at Pearl Harbor, the long trek back across the Pacific, and the vast naval construction program to carry it out were all foreseen. The strategic concept of an "island hopping" campaign actually entered into operations problems as early as 1936. Admirals Spruance and Turner were among the students at that time and their thinking in World War II was undoubtedly influenced by the intensive study of this problem which they had made while students at the War College.

During World War II the War College closed down its regular courses but conducted special short courses to train Reserve Officers, in an emergency

HARD-WORKING MIXED STUDY GROUP IS A TYPICAL SCENE IN PRINGLE LECTURE HALL

NWC IS HOST TO MEN OF MANY NATIONS

program, to prepare them for command and staff duties and for specific billets in unified or joint commands. Approximately 900 officers were graduated from this program alone.

Following the war, Admiral Spruance became President of the College and reconstituted the curriculum on a peacetime basis but with increasing emphasis on the broad problems of national and international affairs. New courses in logistics were set up and well known statesmen, military leaders, educators and social scientists appeared with increasing frequency on the lecture schedule. Officers of the Army, Air Force and Coast Guard had participated with Navy and Marines for many years as both students and staff, but in recent years civilian students have been added from various governmental agencies.

Though largely military, with all the Services represented on it, the Naval War College's staff today benefits from the presence of a talented and diversified group of civilian academicians and a prominent State Department career officer as advisers. A civilian professor of International Law had been attached to the staff in the Chair of International Law from the earliest days of the College and after the war other academic chairs were added. The Ernest J. King Chair of Maritime History, the Chester W. Nimitz Chair of Social and Political Philosophy, the Chair of Physical Sciences, and the Chair of International Relations all now provide assistance to the students and in curriculum development.

Vice Admiral Ingersoll has stated frequently that the Naval War College is considered to be "a body of adults, engaged in intellectual work to benefit the individual, their service and their country." Consequently, the relationship of students to staff is quite different from what might be expected in the usual college or university. It is largely one of equals studying a common problem. The staff does not teach in the usual academic sense but advises the discussion groups and observes results with a view to future improvements based on the success of a current course.

Thus, the academic product of the Naval War College is an intellectual distillation of staff-student effort leavened by the realities of staff and operational knowledge and the experience of the students. The student, free of the pressure of deadlines and day to day problems, can work out his own ideas in a pure academic background, aided by unsurpassed library facilities and the composite backgrounds of fellow students and staff.

In carrying out the Naval War College's academic mission, three resident courses are currently conducted, each a full academic year in length. They are the Course in Naval Warfare, the Command and Staff Course, and the Naval Command Course.

The Course in Naval Warfare is the senior course offered. Officers selected and ordered to this course are generally captains, commanders and a few lieutenant commanders of the Navy and officers of equivalent rank in the other services. The purpose of the Course is to further an understanding of the fundamentals of warfare in order to prepare officers for higher command. Emphasis is placed on the integrated employment of the elements of naval power in accomplishing the Navy's mission and on the strategic employment of sea power to further national objectives. The roles of the other services are studied; joint and unified staff concepts are carefully presented.

The Command and Staff Course includes naval officers within the grades of senior lieutenant to commander, and comparable ranks from the other services. Its objective is to provide students with an opportunity to further their understanding of the fundamentals of warfare, emphasizing the operational functions of command, staff planning and command decision, together with participation in joint and combined committee staff work.

The third of the resident courses, and the one which is unique among all the service war colleges, is the Naval Command Course for senior foreign officers. Officers nominated and selected for this course are outstanding captains and senior commanders of friendly and allied navies whose countries have been invited to send representatives. Typically, about 30 foreign countries are represented. This course prepares such officers for higher command responsibility in their own navies and familiarizes them with U. S. Navy methods, doctrines and weapons. The objective is to provide students with a knowledge of command at fleet level and with an understanding of the principles and methods of warfare of nations alongside whom they may be allied in war.

The students are also provided with

SENIOR REPRESENTATIVES OF EACH BRANCH GATHER IN LIBRARY

STUDENTS AWAIT START OF LECTURE IN PRINGLE AUDITORIUM

a broadened understanding of international relations and of political geography, international law and organization, world resources and the economic aspects of war. Furthermore, the Naval Command Course provides as a by-product an ideal opportunity to exchange service and national viewpoints. It has been highly successful in developing firm international friendships and increasing sympathy and understanding of common problems.

In addition to the regular resident courses, two Reserve Officer Courses of two weeks duration are conducted each year. A Senior Reserve Officers' Course is conducted during the last two weeks of the regular academic year to familiarize selected officers on annual training duty with the latest developments in naval warfare, and to introduce them to some of the problems involved in developing a global strategy.

Also, a Reserve Officers' Command and Staff Course is conducted annually in May. Here carefully selected reserve officers of the rank of lieutenant commander or major are instructed in the planning process and naval staff organization functioning in order to improve their qualifications for service in modern combat naval forces.

In an attempt to extend further the facilities of the Naval War College to non-resident regular and reserve officers of all services, a fourth department provides correspondence courses in International Law, International Relations, Strategy and Tactics, and Logistics. These courses have a reputation for being thorough, up-to-date and quite demanding. Notwithstanding the high degree of challenge, about 2,000 students are currently enrolled.

The final week of each academic year is one of the most significant and intellectually stimulating of all and a fitting climax to the resident students' academic year. Annually since 1949, the Naval War College has conducted Global Strategy Discussions with student, staff, civilian and military guests. Distinguished civilians from private and public life, flag and general officers from all the services, the senior reserve officers in the second of their two weeks' course, form seminar groups with the resident students and the staff where they freely exchange ideas and opinions as they seek solutions to the critical problems facing the nation and the entire Free World.

PRESIDENT EISENHOWER MET ALL COMMAND COURSE OFFICERS DURING NEWPORT VISITS

An integral part of the Global Strategy Discussions is a series of lectures by highly qualified speakers of international stature. The week is brought to a close with a plenary session in which the work of certain groups is presented to the entire assemblage. This week not only synthesizes the work of the preceding year for the resident students, but also exposes the product of that work to the keen analytical scrutiny of outstanding civilian and flag officer visitors. Hence, it is an appropriate culmination to a stimulating year whose basic purpose has been to encourage the logical thought processes of staff and students.

The speed and complexity of modern warfare and the giant steps of modern technology have vastly increased the intellectual demands upon our senior military leaders. The Navy and the nation owe a great debt to the farsightedness of outstanding naval officers such as Admirals Luce and Mahan and to the many who have followed in their footsteps down through the years. From Rear Admiral Stephen B. Luce, its founder, to Vice Admiral Stuart H. Ingersoll, today's president, loyal and dedicated officers have devoted their richest and most fruitful years to the task of passing on the accumulated experience of outstanding careers in the naval service to the energetic, enthusiastic and eager officers who follow in their footsteps.

Perhaps the best modern interpretation of the work of the War College was made by Admiral Ingersoll in his welcoming remarks to the present class. Drawing upon his years of experience in education as well as in positions of great responsibility in the Navy, and looking far beyond the confines of the War College in his remarks, he said:

"Today's world places a great premium on intelligence, individual thinking, upon mental flexibility, and upon a willingness to adapt one's thinking to changing situations. We want to help you develop these qualities here at the Naval War College. We'll do our very best to provide you with an understanding of the underlying philosophy of warfare, to develop familiarity with and practice in logical thought processes, and to nourish your understanding of political, sociological and military factors which affect the national and world situations.

"We hope that we can help you to acquire the best possible judgment for making Command decisions and to acquit yourselves creditably around national and international conference tables. . . . Upon you and your contemporaries will fall the burden of a formulation of the strategy for victory and it is a challenge of impressive proportions. It will call for all your energy, all your intelligence, and I am quite sure your time spent here at the Naval College will be an invaluable preparation for meeting that challenge."

★

This is the first in a series of articles featuring advanced professional courses attended by Naval and Marine Corps officers. Additional details of these activities may be found in NavPers 91769-D.

FLIGHT SIMULATOR SENSE

AVIATION Safety's newest sense pamphlet to roll off the presses is entitled "Flight Simulator Sense." Complete distribution of the booklet, which was prepared by the Aviation Training Division of CNO, is expected by mid-April.

Once again, Robert Osborn inimitably contributes to an easy-to-read and easy-to-understand account of a vital subject to Naval Aviators.

The booklet's author establishes early in his narrative that simulators are designed to supplement rather than replace actual flight training. He enumerates the good things pilots have said of simulators and lists typical gripes.

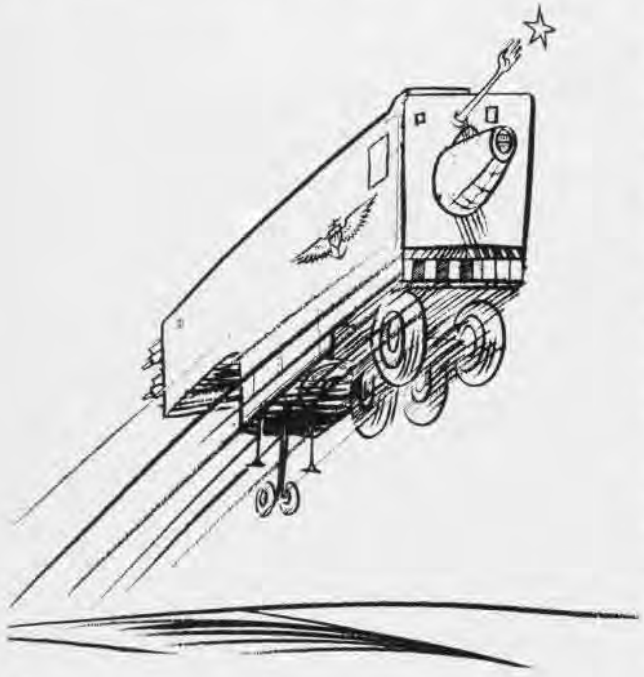
These ten points digest the main message:

1. The simulator is a safe place to practice aircraft procedures and maneuvers. "A fellow can put himself into all sorts of amazing positions in the simulator and be rescued with the flick of a switch."

2. It introduces pilot to airplane under ideal conditions. "No hangar noise, no banshee scream of engines on test stands, no foul weather. . . ."

3. The simulator does what it's supposed to do. It simulates flight. "Consequently the beginner is on his way toward enough mastery of controls and instruments to fly the plane. He learns how it feels during all sorts of maneuvers. And if he makes a wrong move, he can start all over again without making that last, sad calculation of how much insurance he has left the little woman."

4. The simulator puts emphasis where it belongs, on instrument flight. "Any beginner can tool around in practically any aircraft when the skies are clear and bright, but the Navy has a keen desire to prepare every pilot for the rough and tumble of All-Weather."



5. The simulator prepares pilots and crews for all sorts of emergencies. "The OFT does everything from flaming out to bringing a pilot to the point where he pulls the curtain to 'eject.'"

6. Some simulators set up complete combat problems and help develop the teamwork required to solve them. "An enemy contact is made on a hostile aircraft or submarine and the whole performance of following through to tactical victory is worked out in the simulator."

7. The simulator provides the opportunity to rehearse for flights involving rugged conditions. "Not too many people these days believe the best way to teach a youngster to swim is to throw him off the end of a pier. . . ."

8. The simulator saves time, money and promotes efficiency in training pilots and crews. "The modern patrol plane . . . is a far cry from the easy-going, slow-moving craft of a few years back. The complexity of electronics gear is enough to indicate the skill and quick judgment required."

9. At any stage of a mission, the instructor can 'freeze' the problem. "Snarled in a situation that seems to have no possible solution, a beginner tenses up, ready even in a simulator, to push the panic button. This is the moment the instructor makes the quick freeze. The plane is sky-hooked while the student figures out what he ought to do or until the instructor tells him. . . ."

10. In a nutshell, the simulator has three qualities summed up in the word SEE: S-afe, E-conomical, E-fficient.

LET'S LOOK AT THE RECORD

Class 29-59 Sets Record
Has Best Average at OIC School

Class 29-59 completed the Officer Indoctrination Course at Pre-flight School, NAS PENSACOLA, with the highest average ever attained.

Certificates of recognition for outstanding performance were presented to nine of the 23 officers in the class, including Ens. Roger L. Peck, who led the group with an average of 62.60 out of a possible 80 points.

The overall class average was 57.78, topping the record of 55.15 set by class 14-58. There were 21 Navy and two Marine officers in the class.

Transport Squadron Cited
No Traffic Deaths in Nine Years

A new type of safety achievement was celebrated when Norfolk police chief Harold Anderson visited VR-22 at NAS NORFOLK to congratulate the squadron on its record of nine years without a traffic fatality.

Chief Anderson told Capt. F. D. Heyer, commanding officer of VR-22:

"It is indeed gratifying that such a large number of men as yours have been without a fatal accident since your inception on December 22, 1950."

FIVE VA-153 *pilots became Centurions by making 100 or more arrested landings on Hancock during WestPac deployment. They are Cdr. Jack Bauman, LCdr. Ralph Odgers, Lts. Jim Doolittle, Tom Brown, and Ben Fromm.*

HSS-2 TEST-DIPS SONAR DETECTION GEAR

HSS-2 Flights Described
Helo Hovers 3 Hours at Same Spot

A Sikorsy HSS-2 helicopter was hovered three hours over one spot.

The feat was accomplished during development tests of the new ASW helicopter which is now in production. Other test program highlights:

A single HSS-2 has flown about 50 hours in seven working days, including 10½ hours in a single day.

On numerous occasions HSS-2's have been flown on required four-hour missions, returning with more than adequate reserve fuel each time.

On an evaluation flight an HSS-2 experienced a flame-out in one of its two turbine engines. The aircraft was 20 miles from the Sikorsky factory but returned on one engine with what was described as "no problem at all."

Sonar detection gear dips have been made in Long Island Sound and there is every indication that the new sonar equipment will be a major improvement over existing sonar.

Automatic stabilization equipment and navigation equipment installed in an electronics test HSS-2 are being used daily and major improvements in these devices have been noted.

The HSS-2 has flown well in excess of its guaranteed maximum speed.

Ltjg. Hyatt Makes Record
Logs 41,000th on Lake Champlain

Ltjg. Charles E. Hyatt of VS-32 made the 41,000th fixed-wing arrested landing aboard USS *Lake Champlain* in late December as the ASW carrier steamed in the North Atlantic. VS-32 flies S2F *Trackers.*

Rates Awarded VF-121 Men
Two Make E-8, 92 Others Promoted

Ninety-two sailors and two chief petty officers from VF-121's complement of 669 enlisted men were promoted in December.

Cdr. J. M. Thomas, skipper of the Fleet Replacement Pilot training squadron, congratulated two new E-8's, 11 first class petty officers, 41 second class, 31 third class, and nine who advanced to new airman stripes.

Besides training replacement pilots, VF-121 trains maintenance men in Pacific Fleet air units. The number of enlisted trainees studying F3H maintenance varies from 60 to 150.

In addition, VF-121 is instrument training headquarters for AirPac's southern portion, using two-place F9F-8T's for its in-flight instructions.

VMF-122 Claims a Record
Flies 10,000 Hours in Crusaders

Marine Fighter Squadron 122 claimed the distinction of being the first operational Marine Corps fighter squadron to log 10,000 hours in the F8U *Crusader* when 2nd Lt. G. K. Armstrong, the squadron's youngest pilot, passed that milestone in November.

VMF-122 acquired a full complement of 20 *Crusaders* in March 1958. According to the squadron it was the first within the Naval service to log 100 hours in one day and 1000 hours in a month with the F8U.

LTJG. GEORGE B. BALL, *Jr., an A4D Skyhawk pilot of VA-34 aboard USS Saratoga, became the ship's first jet double centurion. He made his 200th arrested landing during routine operations with the Sixth Fleet.*

EXCHANGE PILOTS IN ENGLAND

THEY FLY WITH BRITAIN'S RAF

A THOROUGH PREFLIGHT *briefing is given to Capt. Bierhaalder (left) and Capt. Adrian by their flight commander, Squadron Leader Coutts-Smith.*

MARINE OFFICERS *prepare to get off on a sortie from Duxford, a station which was chosen to present the Royal Review for King George in 1935.*

U. S. MARINES are assigned all over the world, and none has more interesting assignments than exchange pilots in England today: Captains B. M. Adrian, Dirk Bierhaalder, T. A. Griffin, R. C. Bruce, all with the RAF, and Carl Battistone with the Royal Navy. Capts. Adrian and Bierhaalder, a pilot and radar operator team, are attached to Squadron 64, Duxford. From this station also flies a day fighter squadron in Hunter aircraft. Squadron 64 flies Javelin all-weather fighters and is commanded by Wing Cdr. J. A. Wright, an RAF crack night fighter pilot who made his first night kill in January 1941.

HOME BASE *for Number 64 Squadron of the Royal Air Forces is the RAF Station, Duxford. Commissioned as long ago as 1918, Duxford is the oldest active fighter station in the Fighter Command. Located ten miles south of Cambridge, it was a forward station during the Battle of Britain.*

Shangri-La Quits Drydock

Renovated CVA Will Relieve Essex

USS *Shangri-La* slid out of drydock in Bremerton 9 January with the major part of her four-month overhaul completed. She will steam southward around the Horn into the Atlantic and will relieve USS *Essex* which will be converted to a CVS.

Yard work on the *Shangri-La* was concentrated mainly on engineering and air department projects, with operations, gunnery and supply affected to a lesser degree.

In the engine rooms, workmen refaced flanges, built up carbon-packing journals, and cut them back to designed clearance, checked thrust bearings, flexible couplings and various valves.

Firercom boilers were rebricked, superheated tubes replaced, and water tanks cleaned and painted. New clean-out plugs were welded to the economizers while the boilers' interiors were washed with acid.

HagVap apparatus was installed in the firerooms also. HagVap is a chemical which cleans the scale off boiler tubes, eliminating the need for chill shocking or removal of tube nests for cleaning. It leaves no scale of its own.

Generators were equipped with non-corrosive diaphragm seals, replacing the older type which corroded.

Worn Douglas fir planks on the flight deck were torn away and replaced with new wood. The after landing area now has teakwood while the forward part is redone with Douglas fir.

Insulation was installed in the catapult troughs to keep as much heat as possible from escaping from the steam drums. A non-corrosive metal covering was laid over the insulation, and the insulation and its cover were sealed with a special type of putty which withstands high temperatures.

New catapult tubing and valves were installed and the steam accumulator cylinders were cleaned and peened. Main hydraulic pumps were taken apart and worn parts replaced.

A new type of arresting gear has been installed. The cable has more "give" to it, so that the impact on the pilot will not be as great when his tailhook catches the wire.

The hangar deck has been ground down to bare metal in preparation for a new coat of non-skid. The island structure has been entirely repainted.

Shangri-La's operations department got new radar equipment, while the supply department had new equipment installed in the galleys and laundry.

ASO Spotlights Stations

Goal is Improvement of Efficiency

The Aviation Supply Office in Philadelphia has begun a special training scheme designed to teach employees something about the commands with which they deal.

A colorful bulletin board was designed to portray a "Station of the Month," pointing up where the station is, who runs it, whether or not it is near another Navy activity, what rail or water connections it has to receive supplies, where its supply department is located, and who its supply officer is.

A new station is portrayed each month. After the board has been on display for a week in one section of ASO, it revolves to another section.

ASO allocates millions of dollars worth of material monthly. Only with accurate knowledge of the locations and characteristics of the many stations can the job be done with a minimum of cost, the commanding officer feels. This in turn should result in better service to the entire fleet.

Helo Visits Scott Island

First to Reach Isle in 50 Years

Ltjg. Francis M. Dressen of HU-2 flew an HO4S helicopter from the icebreaker *Eastwind* to land the first party on Scott Island since the rock-like landmark was last visited some 50 years ago.

With him were Oceanographer Robert B. Starr of the Navy Hydrographic Office and Lt. Berry L. Meaux of the *Eastwind*. Their purpose was to collect geological specimens and obtain gravity readings before the *Eastwind* proceeded through the ice pack to Antarctica.

Several attempts to put landing parties ashore on Scott Island in recent years were unsuccessful. In 1935 heavy seas prevented a party from Adm. Byrd's ship, *Bear of Oakland*, from reaching the tiny island.

Again in Operation *Highjump*, boarders were repelled when the submarine *Sennett* attempted to establish a weather station on Scott Island.

The small, desolate, rock island is perhaps the most easily recognized of all landmarks among Antarctic explorers. Traditionally it is the "jumping-off point" as well as navigational check-point for shipboard and aircraft navigators as they approach Antarctica.

THE PACIFIC MISSILE RANGE *float, sponsored by Ventura County chapter of the Navy League, won first place in the Armed Services Division of the Tournament of Roses Parade of Pasadena. In keeping with the theme, "Tall Tales and True," the float, "Out of the Blue," featured a bewildered sea serpent astonished by a Polaris missile rising from the sea. Miss Diana McBain, PMR's Navy Day Queen rode the float. It was made of roses (ocean), orchids (trim of sea, serpent, dolphin), golden "mums" (serpent's body), and red and white carnations (missile).*

BuWeps Reports:

NAVY PILOTS PLAY IT COOL

FITTING A FULL *pressure suit is a demanding task. Here Astronaut, LCdr. Walter Schirra, gets a pressure run to give him the "feel" of the suit and to see if the sizing is correct in every detail.*

By Marie Pfeiffer
Acting TIO, BuWeps

WHEN THE DAY comes that man enters outer space, much of the success will be attributed to the conditioned air that the pilot carries with him from locker room, to ready room, to space vehicle, and beyond the atmosphere.

At 35,000 feet there is so little oxygen that a pilot can lose consciousness in two minutes, and death will be imminent. Without protection in the rarefied upper air, man's blood boils in seconds. Safety at high altitudes, therefore, is tied up with atmospheric pressure and air cooling.

Although most modern jet planes are equipped with adequately pressurized cockpits and cooling systems to assure pilot safety and comfort while everything goes well, there is always a remote possibility that some accident may cause loss of pressurization. At altitudes above 50,000 feet in a pressurized cockpit, some form of pressurized suit is required to protect the pilot against sudden pressure failure.

Since a pressurized suit must be a close-fitting, continuous-wear, air and water-tight garment, with the flyer sealed in, a flow of cool, dehumidified air is essential during the time it is warm. Getting rid of the heat and moisture exuded by the body is one of the basic space flight problems.

Mark IV's Built-in Ventilation

Air-conditioning to prevent heat exhaustion, and the effects of flying at cold high altitudes in clothing wet from excessive perspiration is a major feature of the Navy's revolutionary Mark IV full pressure flying suit.

Inside the Mark IV suit the pilot's environment never exceeds 35,000 feet. This is the present optimum altitude at which operational comfort, mobility and physiological well-being coincide. The Naval aviator can be zippered into his suit, spend time in the ready room, walk or be transported to his airplane, and climb in—with air-conditioning all the way. Ground air conditioning units to which the suit is connected satisfy the requirements peculiar to the support of the Mark IV while the pilot is on the ground, and the cockpit's supply system does the job for him when he climbs into the aircraft. With these provisions, he can remain comfortable, and mentally and physically alert even in a complete vacuum, a condition recently found at about 600 miles out in space.

The new Mark IV suit is not only remarkably flexible, but also light weight—20 pounds. It is made from nylon, coated with a man-made rubber—neoprene. It contains sufficient pressure to maintain life in the upper reaches where there is no air and no air pressure. Conditioned air is supplied to the suit from a special air conditioning and pressurization system at the station facility, aboard the aircraft or carrier, or from a "plug-in" to a portable unit.

The air flows from its source of supply into the suit, and then into the suit's built-in air distribution system (vent system). This air flows through the non-collapsible tubes of the suit's vent system, and exits within the suit at the wrists, neck and groin. It then flows through the body of the suit until it passes out of the suit's exhaust part and then through the suit controller.

Getting into the Mark IV full pressure suit is relatively easy even though it has several layers. The pilot puts next to his skin a suit of old-fashioned long underwear if he requires cold water survival protection. Then comes special underwear which is required wearing because of its unique *triloc* patches used in conjunction with the built-in ventilation ducts in the suit torso proper. (Triloc is a non-crushable three dimensional fabric which insures flow of air.) A modified Z-3 anti-G suit is worn over this,

ONE CHARACTERISTIC *of suits in the early days of high altitude flight was that they were so bulky as to practically immobilize the pilot. In contrast, Mark IV suit gives acceptable freedom.*

and then the one-piece Mark IV torso suit. Accessories are gloves, boots and helmet.

Mark IV in Operation

NASA's Project Mercury Astronauts will wear a modified version of the Navy-Goodrich Mark IV suit during brief test flights in the nose of a Redstone missile, and again when they are sent into orbit around the earth by Atlas rockets. The Redstone flights are expected sometime this year with the first orbital attempt scheduled for 1961. Preliminary tests have revealed that with the Mark IV suit, the Mercury manned space vehicle's trip into orbit and back will be a relatively safe journey. NASA now has 21 of the Mark IV's on order.

When the Navy set a new World Altitude Record for aircraft on December 6, 1959 with a McDonnell F4H *Phantom II* carrier jet, its pilot, Cdr. Lawrence E. Flint, USN, safely soared to 98,560 feet with the assistance of the air-conditioned Mark IV pressure suit.

This suit is being used operationally in F8U-1's and —2's by pilots of both the Atlantic and Pacific Fleets, and in tests of A3J's and F4H's by aircraft companies and by Navy test pilots at Patuxent River, Maryland. Other Naval test activities are currently testing F8U's at high-altitudes with the Mark IV suit. The Air Force also has under consideration the purchase of the Mark IV for its Air Defense Command.

Another suit was developed by the Arrowhead Rubber Company, Long Beach, California to meet Navy's Mark IV full pressure suit requirements. It has been fleet evaluated and has qualified, but not yet in operational use. This suit differs from the B. F. Goodrich pressure suit mainly in the construction technique.

Suit Support Aboard Carriers

Provisions for ventilation and cooling of the Navy's Mark IV full pressure suits are being installed in ready rooms of attack aircraft carriers during construction, conversion and regular shipyard overhaul periods. Although the ready rooms in all aircraft carriers are air conditioned, an additional air conditioning system is being installed wherein cooled air is piped to outlets in the deck, under twenty of the seats, for cooling of pilot's pressure suits.

After donning the pressure suit in the nearby dressing room, the pilot relaxes in the ready room chair, awaiting final orders for manning his aircraft. If a lengthy wait in the ready room is evident, the pilot merely reaches below his chair and pulls out a flexible hose, one end of which is attached to the aircraft carrier's cooling system. The other end, by means of a quick detachable fitting, attaches to his suit and an immediate circulation of cooling air through his ventilated suit is available.

Comfort through Ground Support

Certain new shore facilities and

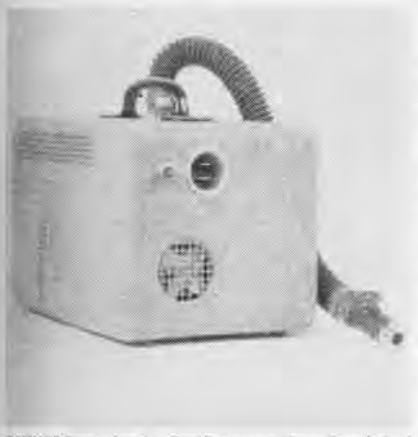
GROUND SUPPORT, *which makes the wearing of the pilot full pressure suit practical, involves the TAC truck. Travelling to the aircraft on the runway from the station is made in real comfort.*

equipment have been provided by the Bureau of Naval Weapons to satisfy requirements peculiar to the support of the Mark IV pressure suit when the Navy pilot is dressing, and in the interim period before being airborne. Because the Mark IV suit is air tight, supplemental ventilation, under pressure, is required to satisfy the pilot's basic physiological requirements. This has been provided by the Bureau of Naval Weapons through the following media:

1. Air-conditioned dressing rooms where ambient temperatures are between 75°-80° F. and relative humidity is between 45-55%. The pilot's body temperature problems are greatly reduced by a cool, dry atmosphere and by having the suit cool and dry. The dressing room also provides space for drying lockers, stowage facilities for the Mark IV suits, and lockers for the pilot's clothing. Since each pilot must be assisted while dressing, the area requirement normally allows for approximately 16 persons (8 standing and 8 sitting).

After dressing, the pilot connects his suit to a conditioned air supply (CASE) unit which meets his body temperature requirements by supplying cool, dry air free of oil, dust, dirt or other contaminant. It is at this point that the pressure suit is tested in making ready for flight.

The CASE equipment is being developed by the Bureau of Naval Weapons to provide for 15 pilots and will be capable of a maximum load of 20 Mark IV full pressure suits at 80% efficiency. This unit will have a high capacity air conditioning unit to cool and dehumidify the air, and also a blower capable of a sustained output of 200 cubic ft/min. at 3 psi, and the necessary temperature and humidity regulating equipment with special filtration to assure oil free, clean air. The CASE Unit is designed to connect to multiple ready room outlets, and a dressing outlet through suitable piping. The units are movable, and it is anticipated that spares will be available to allow for normal maintenance. They are capable of exterior as well as interior mounting. With the proper power supply, CASE units can fulfill the needs of runway alert facilities.



BUWEPS *and A. J. Sawyer Co. developed this portable ventilation-refrigeration unit.*

THE NR-4 MULTI-PURPOSE *air conditioning unit keeps the aircraft cool before the engine is started. While it was designed specifically for shore use, it can also be used aboard ship.*

2. If the pilot must go to the squadron ready room for briefing, the room itself is controlled for temperature between 75°-80° F. and relative humidity between 45-55%, with a personnel load of 30. His Mark IV suit will be connected to a CASE unit which has outlets for 20 suits, for suit conditioning. Outlets are so distributed that the pilots can sit in the ready room chairs and receive conditioned air. The CASE air supply piping terminates with flexible outlet hoses which are connected to the pilot's suit, and these hoses have air volume regulators with quick disconnect shut off connections.

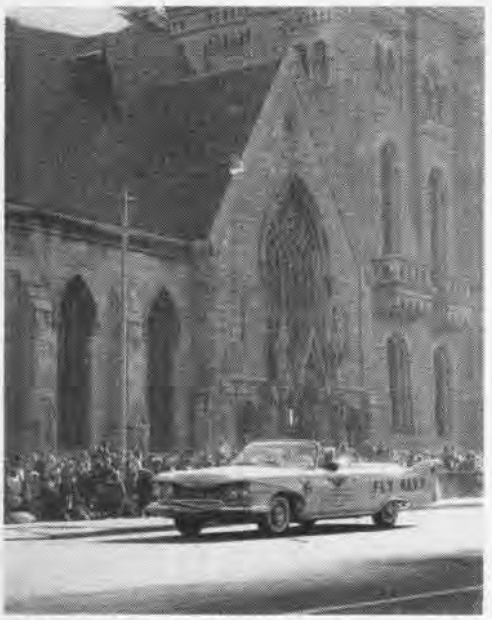
In order to provide additional ready room and dressing room space for permanent installations, and to satisfy changing base requirements, the Bureau of Naval Weapons has introduced trailer mounted ready rooms and dressing rooms in a limited number. These units consist of two interconnected van trailers (each 10' x 37').

The trailers provide complete ready room and dressing room facilities meeting all of the requirements as heretofore described. Requiring only utility connections (electricity, sewage, water, telephone, etc.), the trailer units have the advantage of mobility, standardization and rapid manufacture, and can be moved in the event a base is inactivated. Designed principally for use at stations which have a fluctuating base load, they can also be used at some bases until normal facilities can be constructed.

3. To provide continuity of conditioned air directly after dressing, or after briefing, the pilot is transported to the aircraft in a truck that furnishes conditioned air for his suit requirements. This unit is a 1½ ton step-in-and-drive truck (TAC Truck) equipped with a self powered (gasoline) air conditioning blower unit capable of cooling the interior of the truck and meeting the pressure suit conditioning requirements. This unit will acccomodate eight pilots per trip.

4. A small 16-lb., hand-portable, battery-driven ventilation refrigeration unit, developed by the Bureau of Naval Weapons, has been furnished in limited quantities to ComNavAirLant Squadrons. This unit is intended to be used primarily on carriers by pilots from the ready room to the cockpit, and, as the situation warrants, it can be used in the cockpit prior to engine turn-up. Another unit now being tested at ACEL, with the same mission requirements as the battery unit, uses liquid oxygen as the cooling agent as well as the pressure motivating force.

Weekend Warrior NEWS



MORE THAN *a million Philadelphians saw the NAS Willow Grove "Fly Navy" car in Mummers Parade.*

IT'S ALL *in the family. Chief F. W. Schippert, right, indoctrinates his daughter Frances, and nephew, F. G. Schumacher, both AR's with VS-831 at NAS New York.*

RECRUITING for the Naval Air Reserve is a challenging and satisfying job. Many means are used to spread information on the advantages of joining the organization: radio, television, magazines, newspapers and other advertising devices. One of the most effective, by far, has proved to be word of mouth. Among members of the same family, successful recruiting is particularly inspiring. Here are a few examples that happened to cross the desk about the same time.

At Floyd Bennett Field, NAS NEW YORK, the example set by Chief Ordnanceman Francis W. Schippert, a three-hash mark veteran Reservist, stirred his daughter and nephew to join the program. Both are 18 years old, Airman Recruits, attached to Anti-Submarine Squadron 831, and very enthusiastic.

Then, there's the case of the Garland brothers of Dearborn, Michigan. Paul, the oldest, has already had his stint of active duty; Lawrence is planning to serve two years with the Fleet starting next October; Philip, 17, donned the Navy blue as soon as he could. All three are Weekend Warriors at NAS GROSSE ILE and are members of VR-734.

Lloyd and Albert DuPre of Columbia, S. C., are working on a relatively long-range program. They qualified with flying colors at NAS ATLANTA for Aviation Officer Candidate training, and plan to go to Pensacola later this year after they both graduate from University of South Carolina. In the meantime, the two belong to a Reserve Surface Division in Columbia. Lloyd is a Teleman Third Class and Albert is Storekeeper Third. The former and older served aboard the USS *Forrestal* during his two-year active duty tour from 1954 to 1956. He liked what he saw on the carrier and recommended the life of Navy pilot to his brother.

The Navy is also becoming a family tradition with Edwin Kinnear, ADR 2, with VR-774 at NAS LOS ALAMITOS. Part of the squadron's annual two-week training cruise was spent at NAS ANACOSTIA. At the earliest possible moment after he deplaned from the R5D, Kinnear headed for Annapolis, Maryland where his son, Richard, is a plebe at the Naval Academy. It was their first meeting since he became a midshipman.

PHILIP M. GARLAND, *right, joins brothers Paul and Lawrence, in VR-734 at Grosse Ile.*

FUTURE AOC'S, *DuPre brothers get a briefing from NAS Atlanta skipper, Capt. J. A. Horton.*

A RESERVIST *at NAS Atlanta since 1953, P. S. Head is now an AOC at Pensacola. Cdr. R. O. Rechsteiner and PN3 Mitchell brief him.*

THIRD TIME *running, NAS Oakland boasts area Reservist of the year. Capt. L. E. Burke, C.O., gives Lubbock, AWS-87, Navy League Plaque.*

CAPT. R. B. BUCHAN, *LosAl C.O., pins Navy-Marine Medal on Kemp for sea rescue of 3.*

CARTER, TOYNE, *Razo, Davis, best Dallas men, get Navy League watches from Sid Rochelle.*

AR TO CPO *in NAR, Hill, VR-673, shakes hands with Atlanta C.O., Capt. D. S. Newell.*

VP-663 MAN *of the Year for third time, Vickers, AD1, gets trophy from NARTU Anacostia, C.O., Capt. R. C. LeFever. Runners-up watch.*

FIRST TO MAKE *CPO at NAS Willow Grove under special rating program, T. V. O'Rourke receives Chief's hat from Cdr. J. M. Sheehan.*

OAKLAND TRAINS NEAR AND FAR

AT WHIDBEY ISLAND, *Chiefs Barboza, Eberle, Worley, Albrecht, Hardin, rear, and AO's Figueira and Fizzino pose with FASRon-875 P2V.*

FRAMED BY *the wing tips of two Neptunes. Selected Reservists of VP-871 take off from Oakland bound for anti-submarine operations.*

CHECKING *a VF-873 Banshee are Almeida and, kneeling, Rogers, Ienco, DiGirolamo, Vulpi.*

VF-873 PILOT, *Lt. W. E. Van Tassel, Jr. and Capella, AN. Check out jet for training hop.*

THERE ARE 25 flying squadrons of the Naval Air Reserve assigned to NAS OAKLAND, commanded by Capt. L. E. Burke. Of these, 15 are devoted to ASW; the balance carry out other vital missions. Here is a cross section of widespread AcTraDu activities.

Fleet Air Service Squadron 875, led by Cdr. Mahlon E. Cain maintains and flight tests the P2V *Neptune*. Members participated in a two-week intensive training cruise at NAS WHIDBEY ISLAND.

Down at NAS NORTH ISLAND, pilots of VF-873 claimed an all-time record for an Oakland jet outfit. Cdr. R. H. Finlayson's 15 Naval Aviators logged 709.8 hours in the F2H-4 *Banshee* during the 14-day tour. Availability was an amazing 92.14%.

In addition to patrol missions out of Rota, Spain, VP-872, commanded by Cdr. William Hoffman, took part in Operation *Friendship*. Multi-purpose food was delivered to orphanages; books were distributed to schools; alfalfa seed and redwood trees were presented to cities.

Friendship tokens from California were also carried by VR-872 to the people of Morocco. However, Capt. Jack Counihan, Commander Naval Activities, Port Lyautey, lost no time in putting the Reservists to work with VR-24. It was the second cruise in Africa for Cdr. George Hubert's group.

HIGH PROTEIN *many-purpose food is delivered to Spanish orphanage by Cdr. Hoffman.*

CAPT. JACK COUNIHAN *introduces Cdr. Hubert to Mohommed Berber of Morocco.*

$4-millions Saving Told

Chase Pilot Rides Herd on Robots

Lt. George Gregory of the Pacific Missile Range has helped the Navy to save an estimated $4,000,000 during the past three years by bringing missiles and remotely controlled targets to safe landings.

As pilot of a jet chase plane he has guided more than a dozen *Regulus I* missiles to safe landings and has helped in many instances to land the faster *Regulus II* high speed target. Estimated savings have resulted from both the re-use of missiles and the greater training benefits thus made possible.

He has controlled more than 50 *Regulus* missiles in flight.

One of his most unusual "saves" involved a KDB-1 target. He was flying chase in an operation designed to test the maximum weight the KDB-1 could carry and still give satisfactory performance.

Shortly after the target was air-launched at 16,000 feet from a P2V aircraft it developed fuel pump difficulties and the operation was cancelled. A radio command was given which would release a parachute in the drone, permitting it to fall slowly into the water where it could be picked up.

However, a malfunction occurred and the parachute did not deploy. Lt. Gregory radioed altitude, air speed, and azimuth to a ground controller at Point Mugu who controlled the target by radio command to make a perfect belly landing in the sea.

Lt. Gregory then spotted a Navy crash boat in the area and vectored it into position to recover the drone.

Glynco Teaches Leadership

New School Is Highly Successful

Since it opened its doors on 14 September 1959, the NAS GLYNCO Leadership School has graduated 76 petty officers, including 14 chiefs. Modeled on the course given at the Naval Air Training Command, Pensacola, the curriculum covers military courtesy, naval customs and traditions, self improvement, public speaking and leadership. Instructors are selected from qualified officer personnel.

LCdr. R. E. Hagemann directs the program, assisted by R. D. Ginn, ACCA, and J. J. Webster, SKC. The two CPO's took the Pensacola course.

CAPT. S. M. RANDALL, *ComNavAirTransWingPac, and Earl B. Salsbury of Moffett Red Cross discuss 8½-gallon display of blood which is equivalent to the amount Capt. Randall has personally given during the last 18 years.*

Goes on Presidential Trip

Co-Pilot on Good Will Tour Plane

A Naval Air Reservist from NAS NEW YORK was among the crew of President Eisenhower's historic Asian good will tour. LCdr. Lawrence Brown, an employee of Pan-American World Airlines, was chosen navigator-copilot for the presidential mission by Pan-Am's chief pilot.

Of the three 707 Boeing jets that made the trip, the third, a Pan-American transport, carried the Press, Secret Service, and the White House Staff, totalling 102 passengers. With LCdr. Brown navigating, the Pan-Am jet arrived at the various points 15 minutes before the President's plane.

LCdr. Brown, a veteran of WW II and Korea, is aircrewman training officer for Reserve Squadron VS-837.

BERYLLIUM BALL *at Minneapolis-Honeywell is designed to spin at high speeds while held in position, in a vacuum, by electrical forces. It is expected to result in more accurate gyros for use in missiles and space vehicles.*

Industry-Military Confab

Subj: Future of Manned Aircraft

The future of manned military aircraft, a consideration which has caused some concern in the aeronautical industry, will be the key topic on the agenda of the forthcoming Institute of Aeronautical Sciences National Meeting scheduled for 1-3 August at San Diego, California.

The meeting, which will be attended by military and industry representatives, is expected to stimulate informed discussion and reasonable projections of the future of manned aircraft. Current trends of military requirements for, and usage of, manned aircraft are also slated for the joint talks.

Herbert F. York, Director of Defense Research and Engineering, will be the guest speaker at the IAS dinner on the first of August.

Bullpup Engineers Cited

Get $4500 for Bird's Simplicity

Two Navy research engineers have been awarded $4500 for introducing a radical "no-test-equipment" concept in the *Bullpup* guided missile program.

RAdm. Paul D. Stroop, Chief of the Bureau of Naval Weapons, presented Mr. R. D. Ginter $3150 and Mr. D. F. Spencer $1350. Mr. Ginter is senior project officer for *Bullpup*, and Mr. Spencer is electronics engineer and coordinator for the missile guidance system and evaluation. Both have been associated with the program since 1956.

The awards were made in "recognition of their originality of thought and attention to detail which was required to implement such a plan which has resulted in the most reliable U.S. guided missile weapon system at its initial introduction into service use." The *Bullpup* has been described officially as "simple." Its total costs were reduced drastically upon Fleet introduction, and these savings will continue to compound throughout its service life.

The *Bullpup* system is the only U.S. guided missile to achieve the distinctive "no-test" position. The Air Force has purchased a quantity of *Bullpups* from the Navy and plans to make them standard weapons in the Tactical Air Command. The U. S. Air Force also has adopted the "no-test" theory.

'SEE IT NOW' ON RANGER

AMPEX TV CAMERAMAN DAVE CHAPMAN PHOTOGRAPHS FLIGHT DECK ACTIVITY ON RANGER

A NEW DIMENSION in "See it Now" was demonstrated aboard the Pacific Fleet carrier USS *Ranger* in December as Naval Air Test Center pilots conducted carrier suitability trials with WF-2, F8U-1, F8U-2, A3D-2, A4D-2 and AD-6 airplanes.

A five-man crew from the Ampex Corporation set up a television camera and video tape magnetic recording equipment to capture air operations as they happened aboard the big carrier.

RECORDER WAS OPERATED ON HANGER DECK

Crewmen who rarely see what is happening topside were able to watch takeoffs and landings on television receivers which were located on the hangar deck and in the flag intelligence office.

Pilots returning from flights could go directly to the ready room, still in their flight suits, and observe their individual approach techniques by watching an immediate playback of the tape. Many pilots felt that by seeing their flights played back immediately they learned more than they would have learned if they were required to wait for conventional film to be processed before showing.

When the suitability trials were completed, an edited version of the operation was presented to the *Ranger's* public information officer and a copy was given the Chief of Information for public release.

The Ampex crew stationed a cameraman on the 07 deck where he could shoot all landings aft and still take in the waist and the bow catapults.

At the same time the TV image was being recorded on magnetic tape, radio transmissions between pilots and the ship were being recorded. In this manner, both sound and picture were synchronized so that all observers could watch the flight and hear the pilot's communications with the ship.

TV observers saw pilots of each type of airplane practicing the use of gunsights as carrier landing aids; an A4D-2 being launched by catapult in no-flaps configuration, and heavyweight takeoffs and landings being made by both *Crusader* models and the A3D-2 *Skywarrior*.

Patuxent pilots operated with Ranger's embarked air group in keeping some type of aircraft in the air for a continuous 24-hour period.

Mr. Jules Joslow, senior Ampex representative embarked, said his cameraman and recorder crew were able to photograph operations later in the day than conventional motion picture photography could have done. He attributed this fact to the TV's camera tube which permits the cameraman to shoot objects under poorer light conditions.

"The greatest thrill we had," he said, "was when the heavily-loaded AD-6 was deck-launched. We followed it with the camera as it picked up speed on the flight deck, up to the point where it became airborne. At the instant it appeared to dip toward the sea, it passed out of camera view behind the island.

"We had to race to the other side of the bridge to learn that the *Skyraider* had recovered from the dip and that the pilot was safety airborne."

FROM 07 LEVEL, PHOTOG GETS GOOD VIEW

DD CREWS LEARN HOW HARNESS WORKS

Tin Can Sailors at NAS
Get Briefed on Plane Guard Role

Crew members from four ships of Destroyer Division 11 were sent to NAS MIRAMAR for rescue training before the division deployed to WestPac.

The one-day indoctrination included four hours of classroom instruction on how to remove a pilot from the cockpit of a downed aircraft. This was followed in the afternoon by a three-hour session on the aircraft line, studying methods of entry into airplanes from the outside. The session ended with a demonstration of ejection seats and harnesses used in Naval aircraft.

Speed in freeing pilots from their cockpits was stressed. It was pointed out that modern naval aircraft might sink in a matter of seconds when forced down. All ships of the squadron expect to do plane guard duty.

In addition to operational commitments, the destroyer division will take part in Operation *Handclasp* by carrying clothing, food, and appliances to be distributed in the Far East.

ATU-223 Forms this Month
Will Train Students in F11F Tiger

A new jet training unit will be formed this month at NAAS CHASE FIELD, Beeville, Texas, according to RAdm. J. C. Clifton, Chief of Naval Air Advanced Training. The new unit will train students in the F11F.

ATU-223 will be manned by personnel already assigned at Chase Field.

The F11F is the same type aircraft as Navy's famed *Blue Angels* use.

OLD AND NEW, *the P2V and the P3V-1 are "birds of a feather." Lockheed's P3V-1 antisubmarine patrol plane, forerunner of fleet units now in production for the Navy, has accomplished her first flight tests. Her maiden flight lasted 45 minutes with Chief Engineering Pilot, Herman R. Salmon, at the controls. The P3V, its design based on the commercial Electra, will cruise twice as fast and range 40 per cent farther than front line ASW aircraft now in service, according to Lockheed.*

INSTRUCTOR *Robert A. Beed, AECS, conducts class in world affairs at Naval Air Training Command Leadership School, Pensacola. The five-week course helps chiefs to fulfill moral and military obligations as Navy leaders.*

Record Set by VW Pilot
121 Missions Flown Without Abort

Ltjg. William R. Dorow of VW-14 set a Pacific Barrier record by completing the 121st continuous early warning flights without an abort.

The Pacific Barrier became operational July 1, 1958.

Ltjg. Dorow entered the Navy as an Aviation Cadet in October 1955. He was designated a WV-2 Aircraft Commander in March 1959.

Cecil Landings Improved
Runway is Lengthened, TV Coming

Runway improvements at NAS CECIL FIELD include an extension of 4000 feet, making the runway 12,500 feet long. A closed circuit television will enable tower personnel in daylight hours to check the landing configuration of incoming planes for wind position and landing gear.

The extended runway is operational, and the TV is expected to be put into service soon.

The closed circuit TV is necessary to tower personnel because of the distance between the tower and the aircraft touch-down point. The tower is more than 500 feet from the TV transmitter on the runway.

The TV camera has many features which make it a useful piece of equipment. Among them is the ability to focus the picture, adjust the iris, change the elevation, control a zoomer lens (telephoto lens for close-ups), and turn a set of windshield wipers on in the transmitting unit.

When the new TV system becomes operative, Cecil Field will be able to land nearly any known type of aircraft with a high degree of safety.

IN FOREIGN SKIES

MGEN. BINNEY (C) AND EXCHANGE MARINES

Marines Get Ready for RAF Tour

Three Marine jet pilots and a radar observer officer received a briefing at Headquarters Marine Corps, Washington, D. C. from the Director of Marine Aviation before leaving for a tour of duty with the British Royal Air Force.

In the picture (left to right) are Capt. Darrel E. Bjorklund, 1st Marine Air Wing, Capt. Robert N. Hutchinson, Air Fleet Marine Force Pacific, MGen. Arthur F. Binney, Director, 1st Lt. Michael P. Sullivan, Air Fleet Marine Force Pacific, and Capt. Reece J. Woodward, 3rd Marine Air Wing, radar officer.

The exchange officers will be assigned regular duties with the RAF and will fly British made jets such as the Hawker *Hunter* and *Javelin* Mk. 7.

Saab 35B Draken Exceeds Mach 2

According to Svenska Aeroplan Aktiebolaget, its export version of the J-35B *Draken* has exceeded Mach 2 in level flight. It is powered by a new jet engine of the Rolls Royce RB. 146 type. Like its predecessor, the new *Draken* version is fitted with an afterburner.

The electronic equipment includes two separate communication radios, a modern data link and two navigation systems, one of which is electronic and the other a dead reckoning type.

Much of this equipment is of Swedish manufacture. The equipment includes the Ferranti AIRPASS II, a radar fire control system intended for use in all types of mission against both air and ground targets.

Brazilian Admiral's U.S. Tour

In January, Admiral Jorge da Silva Leite, Chief of the Brazilian Navy General Staff, made a 14-day tour of U.S. Naval facilities as the guest of Adm. Arleigh Burke, CNO.

He spent two days at NOTS *Inyokern* where he received indoctrination on the *Terrier* and *Sidewinder* missiles, the technical programs at China Lake, and witnessed missile tests.

Decorated 17 times by his own government, and by those of Chile, Ecuador and Venezuela, he has been in command of various submarine flotillas, destroyer forces and attack groups, as well as having commanded single ships in earlier years of his career.

At a reception in his honor, Adm. Leite said that his country has purchased from Britain an aircraft carrier now being modernized in Holland.

Trackers for Italy, Netherlands

Under a $16,200,000 BuWeps contract, Grumman Aircraft Engineering Corporation is producing additional S2F-1 *Trackers*. The twin-engined, anti-submarine warfare aircraft will be forwarded by the Navy to Italian and Dutch naval forces under the U. S. Mutual Assistance Program.

Both countries are already using *Trackers* as an ASW weapon. Their crews are undergoing training at the Bethpage company's facilities to enable them to operate efficiently the airplane and its complex equipment.

British Navy Group at PMR

Two British Royal Navy officers recently were briefed at Pacific Missile Range Headquarters on the status and results of airborne missile tests carried out by the Air Development Squadron Four. Skipper of the squadron, Capt. J. G. Smith, was the briefing officer.

The British officers were Capt. G. C. Baldwin, Deputy Director, Admiralty Gunnery Division, and Cdr. E. R. Villar, gunnery staff officer and member of British Joint Service Mission.

FRANCE'S NEW *aircraft carrier, the 22,000-ton Clemenceau, has begun its sea trials. Slated for service in 1962, the carrier will be manned by a crew of 2500, carry some 60 aircraft, primarily Dassault Etendard IVM strike fighters and Bregnet Alize antisubmarine aircraft. The Clemenceau has a flight deck of 815 feet and a 500-foot canted deck at an 8.7° angle. Its top speed is 32 knots. Two steam catapults permit launching a 15-ton aircraft every 30 seconds at a speed of 112 miles per hour. Landing aid is the mirror type.*

Air Museum Curator Cited
Dr. Garber Gets Brewer Trophy

Paul Garber, Head Curator and Historian of the National Air Museum, a unit of the Smithsonian Institution, receives this month the 1959 Frank G. Brewer Trophy in recognition of outstanding activity in the field of aviation education.

The trophy, awarded annually by the National Aeronautic Association, will be presented to Dr. Garber during the sessions of the National Aviation Education Council's fourth annual meeting at Denver's Brown Hotel 26 March.

Dr. Garber was the Brewer Trophy Committee's unanimous choice on the basis of nearly 40 years of "outstanding service to youth and their education in aviation by planning, providing and displaying educational exhibits in the National Air Museum."

He says he first yearned to become a pilot when he saw Orville Wright fly at Fort Myer in 1909. Soon thereafter he organized the Capital Model Aero Club among his school associates; one of the first groups of this type. He served in the Aviation Section of the Signal Corps during WW I, and late in 1918 joined the U.S. Air Mail Service, in the pioneer route between Washington, Philadelphia, and New York.

Dr. Garber's service with the Smithsonian began June 1, 1920. Following Charles Lindbergh's historic flight in 1927, Dr. Garber assisted the Lone Eagle in answering his huge volume of mail.

Dr. Garber was intimately associated with the accession for the Smithsonian of "The Spirit of St. Louis" and many other famous aircraft now preserved by the National Air Museum.

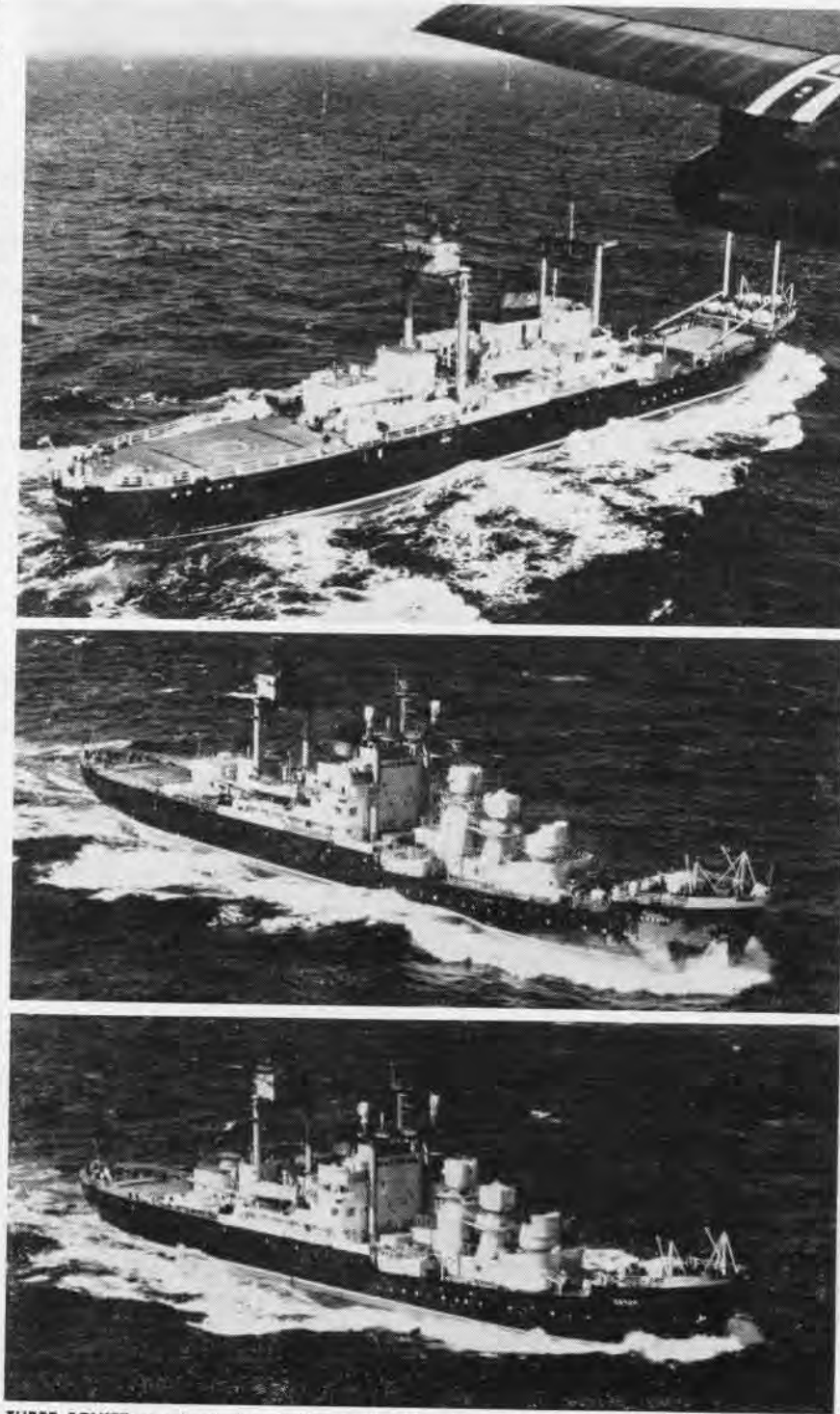
Dr. Garber, now a commander in the Reserve, served in World War II.

MarCad Soloes in T-34B
Program Revived After 19 Years

MarCad Charles E. Inman, a member of the first class of Marine Aviation Cadets since the Forties, became the first student pilot to solo in the T-34B *Mentor* at NAAS SAUFLEY FIELD.

Before his solo flight, Cadet Inman flew 11 dual instructional flights with Capt. Douglas L. Snead and a "safe for solo" check hop with Capt. Will Harrera, another VMT-18 instructor.

NEPTUNE SPOTS USSR SHIPS



THREE SOVIET *merchant ships with considerable electronics gear were observed in the Pacific Ocean when they converged on the impact area for the test-firing of a Russian rocket 1000 miles southwest of Hawaii. The ships carried small utility type helicopters. The photographs were taken by Eugene Meece, PH1, from P2V-7 Neptune belonging to Patrol Squadron Six and piloted by LCdr. Karl F. Cook. The ships (top to bottom) were the Sakhalin, Sibir and Suchan.*

FUEL HEAD *for a Guardian II engine is inspected by craftsmen before welding begins.*

CERAMIC COATING *is applied to combustion chamber and exit cone inside engine.*

GUARDIAN I *tank and chamber assemblies are machine welded on high-arc welding machine.*

NEW ROCKET ENGINES DESIGNED

PRE-PACKAGED liquid propellant engines for *Sparrow III* and *Bullpup* guided missiles are now in full production at Thiokol Chemical Corporation's Bristol, Pa., plant.

Replacing earlier solid propellant engines, they are reported to combine simplicity of handling, constant readiness, and reliability with the better performance that can be expected of liquid propellant engines.

Called *Guardian I* for the *Sparrow III* and *Guardian II* for the *Bullpup*, the new engines incorporate tankage, propellants and thrust chamber in one unit, ready for instant firing after quick assembly with the missiles' airframe and warhead.

No long, elaborate countdown procedures are necessary before firing.

Both *Guardian* engines can be stored safely aboard ship for indefinite periods. Under battle damage conditions the engines will not explode. Should the dry propellant which is used in firing the missile become mixed with the liquid propellant which sustains the missile's flight as a result of battle damage, an easily extinguishable fire results, but not an explosion.

Spilled propellants can be washed off the deck by either fresh or salt water.

The time required to assemble missiles and get them from magazines to their parent aircraft is an important consideration. The new pre-packaged *Guardian* engines, ready for action after the insertion of an "initiator," can save precious minutes in combat.

In designing and producing the *Guardian* engines, this field maintenance concept was followed:

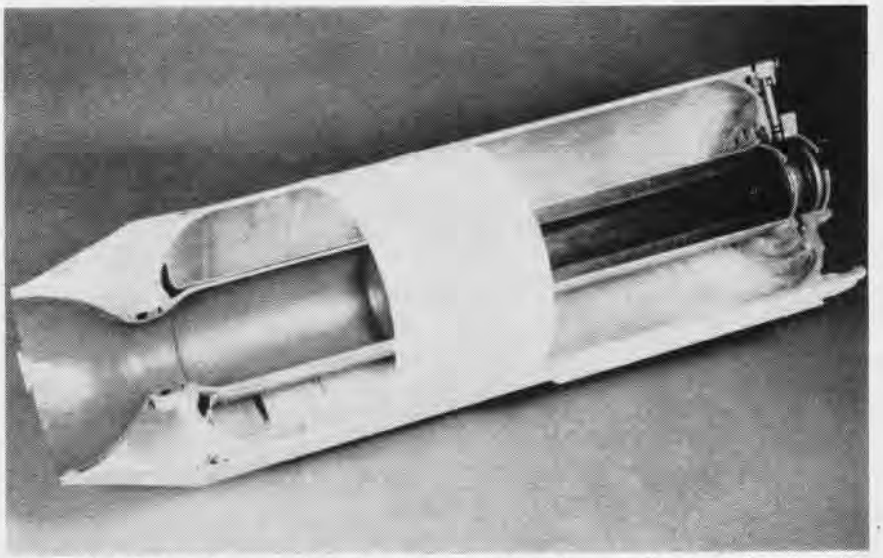
1. At the using activity, either aircraft carrier or air station, operational readiness tests will not be necessary.

2. During storage and handling, safety of field personnel is assured because the units are sealed at the factory.

3. The one-piece, ease-of-handling factor will eliminate the need for specially trained personnel, maintenance, and servicing equipment.

4. Severe shock and vibration loads will not affect the rocket's performance. Its propellants are unaffected by rough treatment, and a low energy solid propellant grain is enclosed and protected by the surrounding propellant.

5. Safety of the unit is enhanced by the fact that it can be quickly and accurately inspected for damage in the event of unavoidable rough treatment.



CUTAWAY VIEW *of the powerplant of a Bullpup air-to-surface missile. Pre-packaged rockets can be stored in a ready state for extended periods of time under extreme environments.*

A visual inspection of the exterior of the rocket engine following severe treatment is sufficient to reveal the nature and extent of the damage. Moderate damage to the tankage walls during rough handling will not adversely affect the operation of the unit. If there is any question about the pressurizing grain, it can be removed readily from its compartment for inspection. If replacement is necessary, another grain may be substituted with little difficulty.

The inherent safety, ruggedness and storability of *Guardian* units have been demonstrated in various tests at Reaction Motors, the Naval Air Rocket Test Station at Lake Denmark, N. J., the Naval Material Center at Point Mugu, and the Naval Ordnance Test Station at Inyokern.

Both *Sparrow III* and *Bullpup* missiles are operational in the fleet.

Sparrow III is the primary armament on the all-weather F3H-2 *Demon* and it will be installed on the new *McDonnel* F4H-1 *Phantom II*.

Radar in the plane scans the skies continuously. When the target is sighted on the scope and "locked on," the missiles are ready to fire.

Sparrow III's may be fired singly or in rapid series.

As soon as a light indicates the target is within range, all the pilot needs to do to launch the missile is to press the release button. From then on, the missile takes over.

Once released from the aircraft, the *Sparrow III* pursues the target despite its attempts to escape. The missile tracks and computes the necessary course to fly in order to collide with the target. Its course is corrected continually during its flight from information which improves in accuracy as the missile approaches its prey. *Sparrow III* targets can be destroyed in head-on attacks at very high closing speeds.

Bullpup, an air-to-ground missile, is operational in A4D *Skyhawk* and FJ-4B *Fury* squadrons. It is relatively inexpensive and extremely accurate when fired at surface targets.

It was designed for use against comparatively small, defended targets such as pillboxes, tanks, truck convoys, bridges, railroad tracks, and marshaling yards. *Bullpup* became operational on attack planes aboard the carrier *USS Lexington* April 25, 1959.

HIGH MAN IN A HOT SPOT

TOP MAN STANDS READY TO RELEASE LUGS HOLDING AIRSHIP TO THE MOORING MAST

Photos by R. Price, PH3

HOW WOULD you like to be strapped to a steel pole, 50 feet in the air, with 30 tons of equipment driven by 1400 horsepower coming directly at you? This is not an episode from a television serial. It is an everyday affair with a ZP-3 "top man."

The top man is the unsung hero of airship ground handling.

He works in all types of weather; wind, rain, fog and snow, on a narrow steel platform 50 feet above the deck. His job is to guide the airship nose cone into the mooring mast cup on landing and to release the airship from the cup on takeoff.

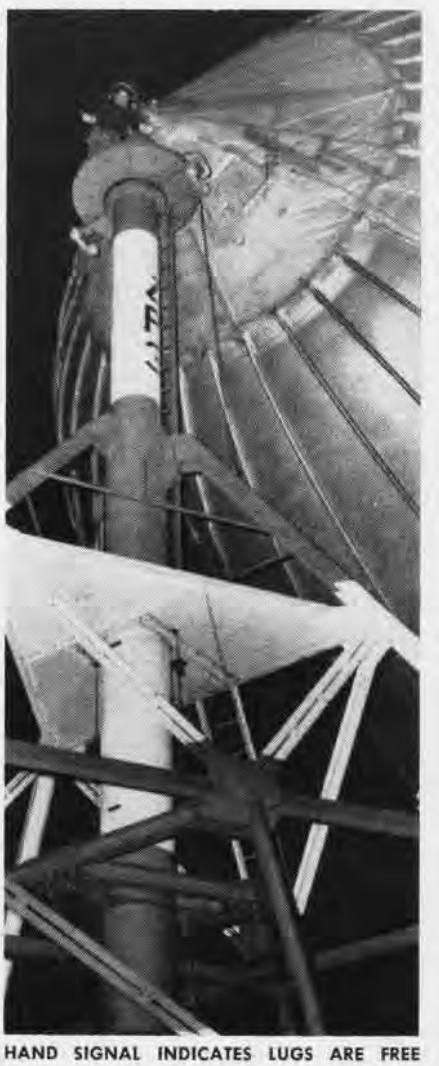
This is not an easy job to do and it often requires a man with nerves of steel. Therefore, top men are all volunteers.

A particularly hazardous time for the top man is when wind conditions, engine failure, or error in judgment on the part of the pilot or ground handling officer allows the airship to override the mast.

Then a top man's courage and skill are taxed to the limit.

He has to protect himself from the oncoming rush of the airship and continue to perform his duties.

Fortunately, the ground handling coordination at NAS LAKEHURST has been so fine and the ZP-3 top men so skillful that no serious injury has ever been suffered by a top man during ground handling evolutions in ZP-3.



HAND SIGNAL INDICATES LUGS ARE FREE

F9F Ends Marine Service

Flew 1305 Hours in Navy, Marines

The "big cats" that for years have prowled the runways at MCAS CHERRY POINT have vanished.

The last F9F-8B *Cougar* to emit its ear-splitting screeches on the North Carolina station has departed; a victim of progress and the swifter, smaller, more silent A4D *Skyhawk*.

Piloted by 1st Lt. Michael R. McDonough of VMA-533, the station's last Cougar was put through its paces in a test hop and was then turned over to Cdr. LeRoy Berkebile for transfer to Naval Reserve Fighter Squadron 727 at NAS GLENVIEW.

Last of the *Cougar* breed in VMA-533, BuNo. 141056 was one of a long line of such jets which served the Marine Corps well during the past five years. Designed originally as a carrier based fighter, the F9F was modified and redesignated the F9F-8B in 1954.

BuNo. 141056 was accepted by the Navy July 25, 1955. It logged 916 hours in Navy squadrons up to July 11, 1958, and then was turned over to VMA-533 for another 389 hours.

Change in Mobile Training

NATTC Unit a Separate Command

A new command has been commissioned at NAS MEMPHIS. Naval Air Mobile Training, formerly a department of the Naval Air Technical Training Center, is now a separate command and is called the Naval Air Mobile Training Group. It is under CNaTechTra.

Cdr. J. G. Osborn, Jr., assumed command as the Group's first C.O. At the commissioning ceremonies, the speaker was RAdm. Fitzhugh Lee.

With headquarters at Memphis, NAMTG is a far-flung organization that includes 68 detachments in 23 locations throughout the continental United States and Hawaii. It takes nearly 700 people to run the organization which in 1959 trained over 41,000 students in specific maintenance on all types of aircraft and armament used in the Navy and Marine Corps. An estimated 48,000 will be trained in 1960.

The types of training offered by NAMTG have undergone changes since the beginning of such training in 1942. The program was initially concerned with instruction in aircraft maintenance. It has branched out now to include training in complete weapons systems.

Instruction is given also on specific engines, gas turbine starters, Martin-Baker ejection seats and guided missiles. Responsibility for providing atomic, biological and chemical warfare defense for all naval activities also comes under NAMTG.

Records on Barrier Patrols

High Flight Time for VW-12 Pilots

Three veteran plane commanders of Airborne Early Warning Squadron Twelve (VW-12) made Barrier Pacific history in December. During one deployment to Midway Island, each logged more than 170 hours with no aborts while completing 12 assigned Barrier patrols.

They were Cdr. Fred M. Rountree, 170.6 hours during a 28-day period; LCdr. William B. Kurlak, 179 hours in a 26-day period; and LCdr. Paul Johnson, 175.9 hours, also in 26 days.

Flying radar-equipped WV-2 Lockheed Warning Star *Constellations*, pilots of the Pacific Barrier Command, logged a combined total of more than 4000 flight hours on Barrier missions 1 November through 10 December.

New Terminal Dedicated

Alameda Building is Ultra Modern

NAS ALAMEDA's newly remodeled air terminal was dedicated in December by RAdm. M. E. Arnold, ComFAir-Alameda and ComNAB-12, who cut the ribbon to place the building in operation.

Remodeled at a cost of $87,798, less cafeteria equipment, the terminal has an ultra-modern cafeteria which will be open 24 hours a day. The first deck houses the Air Terminal Officer and provides a comfortable and spacious passenger lounge, complete with television set, ticket counter, baggage facilities, scales and conveyor.

On the second deck is Naval Overseas Air Cargo Terminal. The third deck has showers, lockers and sleeping quarters for officers and men to use during stopovers.

During the dedication ceremonies, keys to the new building were presented to Capt. E. L. Farrington, C.O.

Better Purifiers Coming

Will See Service on All Carriers

New jet fuel purifiers, capable of processing 12,000 gallons of jet fuel per hour on an around-the-clock basis and of removing dirt and water from the fuel to within rigid specified limits, will be installed on all the Navy's aircraft carriers.

Designated the B-124, the purifiers are being made by the De Laval Separator Company.

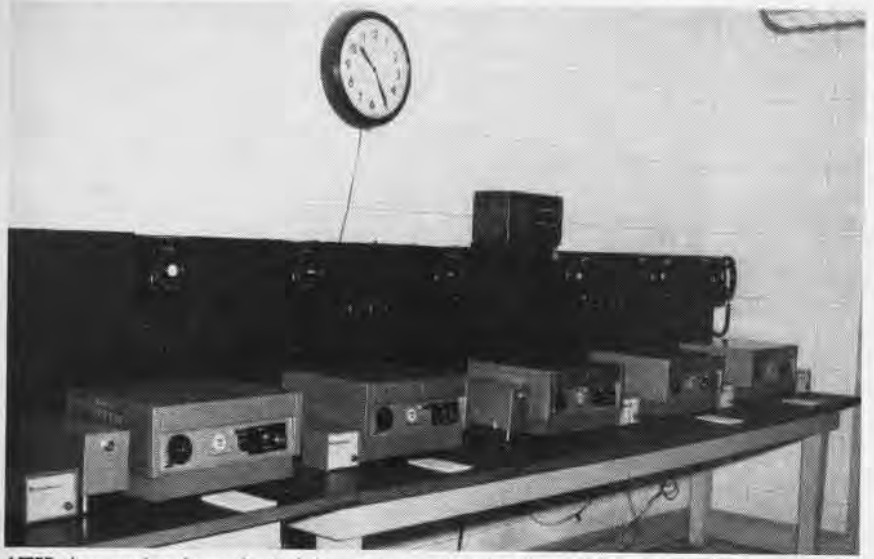
Basically, the B-124 is similar in many ways to the standard type centrifugal fuel purifiers now in use.

Its major difference is that it is the largest unit of its kind ever manufactured for use by the U. S. Navy.

AIRMAN'S CERTIFICATE #295 *and Navy Wings of Gold were awarded Walter N. South, ADC, in 1917. During WW I he made combat patrols in Jennies along the French coast, trained Italians and served as Woodrow Wilson's bodyguard when the President visited Rome. Since 1920 he has been a member of the Reserve. In 1957, he witnessed a no-hands landing on the Antietam honoring his 40 years as a Naval Aviator. In 1959 the 69-year-old Chief had training duty at Glenview.*

MAINTENANCE SERVICE SPEEDED

BEFORE *electronic secretaries were installed, four girls like these talked themselves hoarse answering maintenance calls. Information had to be copied, then teletyped to the workshop.*



AFTER *these unshapely mechanical devices were received, calls could be taken by machine, relayed directly to the working crew. In case of mike fright, the caller can leave his number.*

By Sgt. J. L. Dahlen, USMC

THE EXECUTIVE regards his secretary as an efficient clerk who attends to correspondence and records of a private or confidential nature.

To the layman, a secretary is generally a curvaceous blonde who spends most of her time trying to charm male office workers.

But in the Public Works Maintenance Control Division at MCAS CHERRY POINT, the most controversial secretary is a "cold-blooded" automatic answering device used for maintenance repair calls.

Five of these machines, called "Electronic Secretaries," are being used by Public Works to handle the daily flood of calls reporting everything from cats in the attic to sparks in a light switch.

Early last year, Mr. James Gaskins, Maintenance Control Division supervisor, found that four women were talking themselves hoarse while answering maintenance calls. Such a personal answering service was expensive and, because most calls lasted for two minutes or more, a troublesome bottleneck was hampering quick maintenance service.

To resolve the problem, Mr. Gaskins began to devise a system which he believed would transfer the burden from the four women to a tireless mechanical secretary. He flew to Milwaukee and, after consultation with a civilian firm, Cherry Point's "Electronics Secretary" was born.

Two of the machines were installed last October. They proved to be satisfactory, so four more were ordered and installed. One is a spare.

Maintenance calls placed during working hours are teletyped directly to the repair center by a woman who monitors the machines. Calls placed after normal working hours and on holidays are transmitted to the workmen by remote control.

By using the remote control method, workmen are able to call in after completing a job to receive instructions for the next work order from the machine.

While the electronic secretaries have become "sweethearts" to Public Works, they are regarded by some callers as mechanical monsters. Upon dialing the maintenance number, some complain that they become afflicted with "mike fright" when confronted by the answering device.

Public Works officials tell such persons that mike fright can be cured in one of two ways:

First, if someone is having difficulty talking to the Electronic Secretary, a human monitor who listens to all messages can pick up a telephone receiver and talk to the person calling. Secondly, those with severe cases of mike fright can call, state their name and telephone number, and ask to be called back.

All parties have been warned, however, that calls to the electronic secretary can be traced and pranksters will be subject to disciplinary action.

AGE-OLD CUSTOMS CUSTOM *was changed recently, and according to the USS Hancock (CVA-19) the event logged a Hancock and a Navy first in that it marked the first time a naval vessel had gone through customs at sea. The novel experiment, which is not expected to become SOP, occurred as the attack carrier neared Hawaii after completing a five and a half month tour in the Far East. Capt. Henry L. Miller, Hancock skipper, second from right, greets the group.*

New Fuel Gauge Developed

Checks Quantity by Atomic Method

A fuel gauge which uses sources of atomic energy to measure the amount of fuel in aircraft and missiles has been developed by Atomics International for use by the Navy.

The light-weight, transistorized gauge is capable of measuring amounts of fuel with greater accuracy and reliability than conventional devices.

It has been tested at altitudes to 38,000 feet and has performed accurately during all flight altitudes. It was installed in a twin-engine jet bomber for the tests.

All types of solid and liquid propellants can be measured by the gauge, and its performance is not affected by impurities in the fuel. Easy to install, it accounts automatically for differences in hydro-carbon or petroleum-based fuels which affect the accuracy of conventional devices.

Atomic materials used in the gauge are those which are sources of gamma radiation, such as Cobalt-60.

Radiation sources are mounted on the sides of each fuel tank, along with detectors. Gamma rays given off by the radioactive materials pass through the fuel supply, decreasing in intensity as they do so. The amount of fuel is determined by the intensity of the gamma rays as they reach the detectors.

A ratemeter converts pulses picked up by the detectors into DC voltage and the quantity of fuel is recorded in pounds by an indicator.

Atomics International is a division of North American Aviation, Inc.

One-Wheel Landing Made

Carrier Bomber Diverted to Base

A 70,000 A3D-2 *Skywarrior* landed safely at MCAF IWAKUNI, Japan, with one wheel and tire missing completely. The wheel was lost while LCdr. Joseph W. Atkins, pilot, was making carrier landing aboard the *Hancock*.

Diverted to Iwakuni for an emergency landing, the VAH-6 pilot climbed to altitude and radioed a call for assistance. He was low on fuel and 25 minutes from Iwakuni at the time. Marine Air Control Squadron Four picked up his call, identified the big jet on its radar scopes, and directed it to the field from 100 miles out.

Lt. Charlie Darr, MACS-4 radar duty officer, also notified Base Operations and the entire air facility network of men and machines sprang into action. Within 16 minutes the runway had been foamed down.

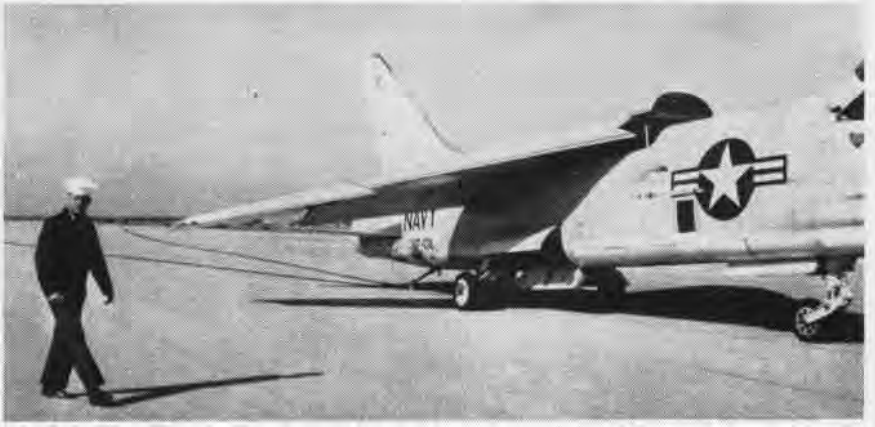
Because of construction on the north end of the runway, the *Skywarrior* set up its pattern to the south, depending on the arresting gear to stop the plane since brakes could not be used. Fifteen minutes fuel remained.

On the first pass the touchdown was smooth, but the wheel drum, minus wheel and tire, ripped into the arresting cables, breaking some and tearing the others from their supports so the tail hook could not engage.

LCdr. Atkins added power and coaxed the plane back in the air, knowing it would be impossible to stop on the small amount of runway left. He did not use full power because the increased drag caused by the damaged wheel caused the plane to swerve.

Down to bare minimum fuel, he flew a normal landing pattern and set the big plane down once more, this time employing his drag chute as if he were making a standard landing.

The steel brake drum, smoking as it rolled down the concrete runway, hit the cooling blanket of foam and the plane eased to a stop at the 6000-foot marker, completely undamaged from the two landings and ready to fly again with addition of a new wheel and tire.



WATER SQUEEZER *principle employed in new type arresting gear for aircraft is tested by Cdr. Ward S. Miller, C.O. of VF-174, in F8U Crusader. He touched down against the wire at 163 mph, then taxied into wire at 100 mph in aircraft weighing 20,000 pounds. In both tests, gear stopped the plane within 1000 feet. Gear was designed for emergency arrests of hook-equipped planes and can save plane in case of an aborted take-off or fast landing.*

SHADES OF THE TWENTIES! *Navy's newest aircraft, the Piper Aztec at right, bears same designator as the old Vought convertible at left—UO-1. First UO-1 was designed as wheels/floats convertible land or sea observation plane. Plane at top left bears seal of the Chief of the Bureau of Aeronautics. Lower left plane was assigned to battleship Tennessee. Shots were made in 1924-1926. Navy expects to enter negotiations with Piper Aircraft Corp. for a number of Aztecs to be employed as utility aircraft at continental US bases. By comparison, Vought UO-1 was 2-place plane, had single 200 hp Wright engine, attained 122 mph max speed, had 398 miles max range and its tanks held 46 gallons of fuel. Gross weight was 2230 pounds. New off-the-shelf Piper UO-1 which, incidentally, still has civilian markings, is 5-place plane, has twin 250-hp Lycoming engines, top speed of 215 mph and normal cruising range of 1025 miles. Its normal gross operating weight, with four passengers, fuel and equipment, is reported as 4400 lbs.*

NAS Glynco Men Honored
One Cited for Deep Freeze Rescue

At NAS GLYNCO, Capt. J. T. Moynahan, Commanding Officer, awarded a citation and four letters of commendation to five men attached to the station.

Patrick G. Milton, AD2, received a citation from the Secretary of the Navy "for meritorious achievement on 28 February 1958 while participating in the rescue of three men adrift on a rubber raft in the freezing waters of Kainan Bay, Little America, Antarctica, during Operation *Deep Freeze III*. As a crew member Milton aided in guiding the pilot to a proper position over the raft, which had drifted dangerously close to the ice barrier. Remaining at his post until each of the three men was carried to safety, he contributed materially to the success of the mission."

Harold C. Chandler, AKC, Robert D. Ginn, ACC, and James L. Webster, SKC, received letters of commendation from the Commanding Officer for their outstanding work in inaugurating a Naval Leadership course at Glynco.

Claud R. Chastain, ATCS, received a letter of commendation from the Commanding Officer, for his outstanding work in Ground Controlled Approach.

Whiting's Student Load Up
Total 50% Higher than that of '58

During 1959, Naval Auxiliary Air Station, Whiting Field, trained 50% more flight students than in 1958. A total of 1852 flight students completed their course, an increase of 633.

The additional load of students in 1959 raised the total flight hours logged to 185,805—an increase of 40,678 hours over the number flown in 1958.

Closing of NAAS BARIN FIELD and NAAS CORRY FIELD was chief cause of the increase. A greater increase is expected in the next two years with the transfer to Whiting Field of the Multi-Engine Training Group.

Sperry Building Own Sea
Will Test Submarine Search Gear

Sperry Gyroscope Company has announced the start of construction of a man-made "sea" in Great Neck, New York which will be used to help solve major problems in developing submarine detection equipment.

Because sound travels through water for comparatively short distances, the main limitation on underwater detection devices is the environment in which they may be used.

Testing detection devices at sea where conditions such as storms, sea turbulence, rolling and pitching of the ship cannot be controlled, would take a much longer period of time to achieve the same results that can be obtained in the 'Sperry Sea' where conditions can be varied and controlled under a laboratory environment, company engineers feel.

The sea being built by Sperry consists of a test basin about 400 feet long, 200 feet wide and 25 feet deep.

LETTERS

SIRS:

Until today, I was under the impression that "nautical types" were genned up on their aircraft recce., but after reading your November edition I am having doubts about the matter.

It is a small enough error when taken as a part of an excellent magazine, but who has ever seen a *Vanguard* (page 17) with engine nacelles that size, or come to that, a *Britannia* with a Vickers type wing! Swop them over and I'll forgive you this time. After all it may have been a printer's error.

J. REYNOLDS, CPL.
RAF Support Unit

Allied Air Forces Hqtrs.
Fountainbleau, France

¶Tally-ho! Jane's confirms your suspicion. Consider them swopped. And we're going to write a letter to the editor of our usually impeccable British source!

SIRS:

On page 31 of the December 1959 issue of Naval Aviation News is a photograph of the Prudential Insurance Building in Jacksonville, Florida. The photo was supposed to have been taken from 40,000 feet by a VFP-62 pilot.

The perspective in the picture was so pronounced that I started checking and found by measuring the height and length of the building and the apparent taper that the photograph was made from less than 2000 feet.

The scale 1" = 83' seems correct, so I wonder if you have another photo of the same scale of the same building actually taken from 40,000 feet.

P. D. KULDELL
Systems Analysis Division

BUWEPS

SIRS:

The picture which appears on page 31 of the December issue of NANEWS is a typical example of the photography taken by this command. However, the statement that the large scale photo was obtained by enlarging the small inset photo 76 times is incorrect.

The large scale photo was taken from an altitude of 3,000 feet, using a 36" focal length CA-13 camera; whereas the inset photo was shot from 40,000 feet using a 6" focal length CA-3-2B camera.

The resultant scales are 1:1,000 and 1:80,000 respectively.

The picture appearing in your fine magazine is a duplication of page 46, Part Three in the Photographic Capabilities Book of this command; and is one of several depicting various scales which may be obtained by the F8U-1P.

Such an enlargement as is described in the article accompanying the photo is not possible with the equipment presently being used in the fleet.

W. A. SHRYOCK, CAPT.
C.O., VFP-62

¶Thank you for setting the record straight on this. We cancelled our charter membership in the Good Faith Association and now share a big blush with other "experts" who bore a hand.

RETIRED FROM FLIGHT *after three years in the Antarctic, this R4D has been de-winged and converted into a taxi to carry aircrewmen from the sea ice landing strip on McMurdo Sound up to the Naval Air Facility.*

SIRS:

In the January *Naval Aviation News*, VF-124 made the claim to be the first operational squadron to take the F9F-8T *Cougar* aboard ship. This may well be true. However, Advanced Training Unit 212 has been qualifying students and instructors in the F9F-8T since September 1958.

In calendar 1959, 142 students and instructors carrier-qualified in the ST aboard the USS *Antietam* (CVS-36). These qualifications were made without a single accident or incident.

ATU-212 is justly proud of its accomplishments and welcomes VF-124 in joining the fold.

H. E. DANNER, JR., CDR.
OinC, ATU-212

NAAS KINGSVILLE

SIRS:

Jig! Jig! Jig! In your article in the January 1960 NANEWS, p. 3, entitled "Aid to Houston Tragedy," did you mean *gallon* cans of *chemical foam*? How about *five-gallon* cans of *mechanical foam*?

DON WALKER
Crash Crew Captain

NAS WHIDBEY

¶According to source, 423 five-gallon cans of *chemical foam* were used to fight the flaming tanker at Houston.

• PHOTO CREDITS

Pictures of planes in flight on pages 20 and 21 as well as picture of Duxford base of RAF are used by permission of "The Aeroplane and Astronautics." Pictures of U.S. Marine officers on the same pages are published by courtesy of "Stars and Stripes."

FM NAAS SAUFLEY FLD
TO CNO
REQUEST PASS GRAMPAW PETTIBONE X NAAS SAUFLEY FIELD WITH BASIC TRAINING GROUP 1 AND 5 ON BOARD FLEW TOTAL 26677 ACCIDENT FREE HOURS 2ND QUARTER FISCAL 60 X DURING THIS PERIOD THERE WERE 109079 LDGS INCLUDING 23319 FCLP AND 3256 CV LDGS X BTG-1 COMPLETED 336 STUDENTS CMM BTG-5 355 X CNABATRA QUARTERLY SAFETY AWARD GOES TO BOTH GROUPS AND MAINTENANCE DEPARTMENT SINCE BOTH GROUPS ENDED IN ACCIDENT FREE TIE X AVIATORS ARE GIVING THE BIGGEST CELEBRATION EVER HELD IN THESE PARTS AT 1500S 22 JAN TO RECOGNIZE THE BEST MAINTENANCE DEPARTMENT WE KNOW OF X HOPE YOU CAN ATTEND

FM CNO
TO NAAS SAUFLEY FLD
PASS TO BTG ONE AND BTG FIVE AND BEST MAINTENANCE DEPARTMENT EVER CLN YOU OLD PRO'S ARE DRIVIN ME CLEAN OUT OF THE WRITIN BUSINESS X DOC REPORTS GRAMPS BLOOD PRESSURE SO LOW HE CAN STICK AROUND FEW MORE YEARS X UNABLE ATTEND DUE NECESSITY GIVE ATTENTION LESS PROFESSIONAL TYPES X GRAMPAW PETTIBONE SENDS

Forrestal Gets Big Names

Jones Sees MacArthur, Misses Lee

John Paul Jones has made the acquaintance of Douglas MacArthur aboard the carrier *Forrestal*. He reported too late to meet Robert E. Lee, who already had been transferred.

Jones, a seaman, is in the ship's Fourth Division. MacArthur works in G Division. Lee was with VAW-12.

Boots to AC1 in 4 Years

Menard Turned 21 Last December

Air Controlman Victor A. Menard boasts the distinction of making first class petty officer in four years, two months. He turned 21 in September.

The Saufley Field sailor entered the Navy at 17 in 1955. He attended AN "P" school at Norfolk, then went to CIC "C" school. Before reporting to Saufley he went through ACT "A" school at NATTU OLATHE.

He was advanced to AA in December 1955; AN, 1 June 1956; AC3, 16 November 1956; AC2 1 December 1957, and made 1st class 16 December.

VU-2

SQUADRON INSIGNIA

Last January a Utility Squadron 2 Detachment, led by Cdr. J. H. Gullett, the squadron C. O., deployed from NAS Quonset Point to Roosevelt Roads, Puerto Rico. Its mission was to support the Fleet in Operation *Springboard*. VU-2 provides versatility in services. FJ's are used for high-speed radar targets, JD's tow, and KDB and KD2R radio-controlled targets make realistic marks. Cdr. K. Hershey recently relieved Cdr. Gullett (standing right of plaque in group shot).

★ ★ ★

GOOD-WILL AMBASSADORS

If you're worried these days about juvenile delinquency and the lack of purpose of American young people, drop in on the Sixth Fleet. . . . Get acquainted with the officers and crew of these warships which cruise up and down the Mediterranean.

I've just had this privilege for three days. Not all Americans, I realize, are like the 25,000 Navy men—plus a strong Marine Corps contingent—which man the ships that "show the flag" and patrol the peace from Gibraltar to the shore of Turkey. Would that they were! For there you can perceive how fine, how purposeful, how courteous, how efficient young Americans can be when they've got a job to do in which they take pride. And when those oldsters ultimately in charge do not surrender to the false slogan that "youth must have its fling."

* * *

The Navy always corrals a good crop of American young men. It also does a good job with them. It has completely quashed, in the Sixth Fleet, the old adage that a bunch of sailors in port from the fleet are a batch of drunken troublemakers.

I sat down at the buffet dinner aboard the aircraft carrier Essex between two Marine officers. One of them began immediately telling me about the reputation of this fleet up and down Mare Nostrum, and how it's jealously guarded. "The first captain to command the Essex in the Mediterranean began to indoctrinate the crew in responsible conduct ashore, and this tradition has continued ever since."

"Admiral Anderson (Vice Admiral George W. Anderson, Jr., Sixth Fleet commander) is no slouch at this business, either," continued my other mess companion. "He dins it into the ship captains."

My cabin mate aboard the Essex was a Navy lieutenant, Bob Porter, whose wife studied at Tufts College near Boston. He flies one of those Navy jets which entertained President Eisenhower with bombing runs at a "sled" target towed astern and by firing Sidewinders at flares in the sky. He and his colleagues, every one that I met, were alert, purposeful, ready with intelligent conversation—but considerate of reporters who had just traveled 18,000 hectic miles with a fast-moving President and who were looking for rest and sleep.

It was heartening to compare these men of today's fleet with some of the youngsters encountered . . . overseas during World War II who had only the foggiest notion of why they were in the battle.

Surface impressions are borne out by actual records. Between January and August, men of the Sixth Fleet had 218,818 "liberties" ashore. During this period, only 180 men were listed for disciplinary action. A main reason is the normal good behavior of officers and crew. Another is the fact that shore patrolmen grab sailors who appear to be imbibing too much and hustle them back to ship before harm is done.

* * *

But there is a more affirmative side to the Sixth Fleet's record. Like the United States Air Force, whose motto at its big bomber bases in Spain and Morocco is "Peace is our profession," the Navy in the Mediterranean actively works to promote good will.

When a French Riviera dam recently burst with tragic consequences, helicopters from the Essex flew medical and food supplies into the area.

This year ships of the fleet—cruisers and the two carriers—have paid courtesy visits to ports in Turkey and Lebanon, Tunisia and France. In every instance the Sixth Fleet has earned good will for the United States and an increasing appreciation of its own role in patrolling the Mediterranean.

A generation of high purpose, with a goal of serving their country, the officers and crew of the Sixth Fleet, trained and fit, are living proof America need not go soft or lose its lofty aims.

This article was written by William H. Stringer, Chief of the Washington News Bureau of the Christian Science Monitor. It originally appeared in his regular column, "State of the Nations."