

NAVAL AVIATION

# NEWS



42nd Year of Publication

FEBRUARY 1961





## HAWKEYE IN FIRST FLIGHT

Unusual lines of the Grumman W2F-1 Hawkeye stand out in this silhouette shot made during the plane's first flight over Long Island. Besides being distinctive from recognition standpoint (four tails and rotodome), the high-flying, electronics-laden Hawkeye will open new vistas in airborne early warning and will provide split-second control of U.S. Navy carrier-based fighters.



# NAVAL AVIATION NEWS

FORTY-SECOND YEAR OF PUBLICATION, FEBRUARY 1961

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## ■ COVER

Three F8U-2 Crusaders of Marine Fighter Squadron 333 are put through their paces aboard the USS Forrestal (CVA-59) in the Atlantic. With the early introduction of the -2N into fleet service, the role of the formidable Crusader series will be expanded further.

*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 2304 Munitions Bldg.; Telephone Oxford 61755 or 61880. 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

## Enterprise Goes Critical First of 8 Reactors 'On the Line'

The first one of USS *Enterprise's* eight nuclear reactors went critical at 0751 December 2. The event was equivalent to turning on power for the first time.

It was the first sustained nuclear reaction ever performed on an American surface ship, and it took place on the 18th anniversary of the first time in history that a nuclear chain reaction was deliberately initiated.

The original reaction was achieved in an experimental assembly of graphite and uranium under the West stands of Stagg Field at the University of Chicago, 2 December 1942.

Present at the time *Enterprise's* reactor went critical were VAdm, H.G. Rickover, Mr. Milton Shaw, project manager, Naval Reactors; Mr. P.N. Ross, Manager of the Bettis Atomic Power Laboratory; Mr. A.P. Zechella, Bettis resident manager at Newport News; Mr. W.E. Blewitt, President of the Newport News Shipbuilding and Dry Dock Corporation; and Vice Presidents D.A. Holden, M.L. Ireland and L.R. Sorenson, along with LCdr. R.E. Kosiba of the AEC Office at Newport News, Virginia.

## VMA-121 Honored Again Given Second Award in 2 Months

Another first for the United States Marine Corps was logged in December aboard the aircraft carrier USS *Coral Sea* cruising in the North Pacific Ocean.

Marine Attack Squadron 121 of Marine Aircraft Group 12, First Marine Aircraft Wing, was presented the Commandant of the Marine Corps Aviation Efficiency Trophy for the fiscal year 1960, just two months after

receiving the Chief of Naval Operations Safety Award. It is the first jet attack squadron to receive these two coveted awards in one year, according to the squadron.

The CMC efficiency trophy is given to the squadron adjudged the most excellent in the performance of its designated mission achievements in flight safety and accident prevention.

The trophy was presented to Maj. William L. Traynor, Commanding Officer of the squadron at a formation on the hangar deck of the *Coral Sea*. MGen. Avery R. Kier, Commanding General, 1st MAW, who was representing the Commandant of the Marine Corps, made the presentation.

## Midshipmen Indoctrinated Corpus Gives Three-Day Field Trip

NAS CORPUS CHRISTI recently completed the first of over a dozen planned three-day aviation indoctrination field trips for NROTC contract midshipmen.

The 36 University of Texas students spent a packed three-day period in which they were given ground school lectures, pressure chamber and ejection seat checkouts, and an opportunity to fly in a naval aircraft.

The short aviation field trips give NROTC contract midshipmen who are unable to make a formal aviation summer cruise an introduction to U.S. Naval Aviation.

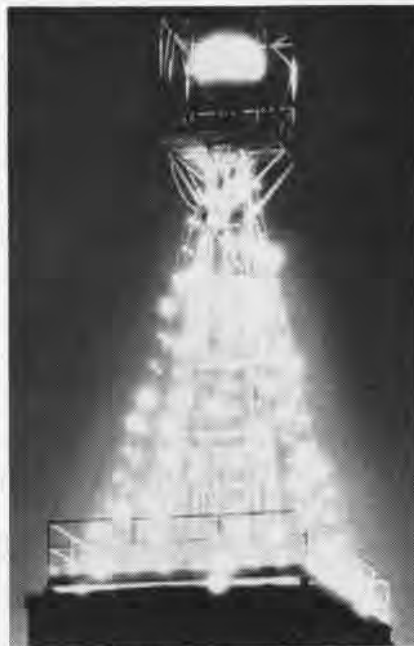
## Corpsmen Rescue Roomers Sound Alarm, Help Men from Fire

Two corpsmen from NAS MEMPHIS were credited with saving six persons by rushing into a burning rooming house and alerting its occupants.

Louis J. Jernigan and Von Carner, both HMS, were driving through Marked Tree, Ark., in a Navy ambulance when they saw flames shooting out from the roof. Using the ambulance siren to help arouse the occupants and nearby residents, the corpsmen dashed into the three-story building to help evacuate the tenants.

Jernigan carried an elderly crippled man to safety before going back with Carner for another man still believed to be inside. Flames forced the sailors out of the building, but all persons were safe.

The corpsmen stood by with the ambulance and resuscitator equipment until the fire was under control and they were assured nobody was injured, then resumed their trip to Jonesboro, Arkansas, to pick up a patient.



**A CHRISTMAS tree in palm tree land!** The flashing beacon on the signal tower was the "guiding star" atop a tree of lights at NAS Key West. Made of strings of colored lights, the display tree could be seen for 30 miles.

## Two Sergeants Decorated Both Receive Navy-Marine Medals

Two Marine sergeants have been cited for bravery at MCAS El Toro.

SSgt. John D. Rexrode won the Navy-Marine Corps medal for working 25 minutes to free the pilot of a burning jet fighter after a crash.

SSgt. Clifford C. Kinneavy was awarded the same decoration for seizing a faulty flame thrower from a student operator in Okinawa and deflecting the flame away from a group of men.

Kinneavy suffered severe burns but held the gun until its fuel was spent.

## Radar Intercept Officers First Class Graduated at Miramar

Navy's first graduating class of Radar Intercept Officers has received its air observer wings.

RAdm. W. F. Rodee, Commander Fleet Air San Diego, made the presentation. The eight officers represent the first radar intercept officers for the Navy's new two-place McDonnell F4H Phantom jet. These officers are slated to perform the duty of radar operator and assist the pilot in high speed navigation and radio communications.

The three-month course the officers took, instructed by VF-121, consists of a wide range of aviation subjects including navigation, engineering, radar intercept procedures, and survival. VF-121 training unit at NAS Mira-



**FIRST WINNER** of the CNO annual Leadership Award for enlisted men in the Pacific fleet is William J. Hawkins, ATC, who accepts the honor from RAdm. William A. Sutherland, Jr., Commander Fleet Air Western Pacific. Said Admiral Burke in a message to Hawkins: "You are indeed an outstanding chief petty officer. However, you are particularly commended for the manner in which you have carried out the principles of General Order 21 . . . in your work."

MAR has a faculty of more than 100 officers commanded by Cdr. E. Hanks.

Officers who won their wings were: Lt. Jerry P. Anderson, Lt. J.B. Capps, Ltjg. J.J. O'Donnell, Ltjg. Kirk W. Sheehan, Ens. E.P. Szezyller, Ens. David J. Rollins, Warrant Officers S.A. Parrish and James H. Glace.

## Captain Counihan Honored On-scene Commander at Agadir

Capt. John L. Counihan, Commander Naval Activities at Port Lyautey, has been awarded the Navy Commendation Medal for his work in the Agadir earthquakes last year.

RAdm. C. S. Cooper, Commander Fleet Air Mediterranean and Commander Naval Activities Mediterranean, presented the citation which read:

"For meritorious achievement as Navy On-scene Commander in connection with the earthquake disaster at Agadir, Morocco, from 1 to 6 March 1960: Immediately following the disaster, Capt. Counihan organized the initial reconnaissance and medical teams, established liaison with French and Moroccan authorities, and skillfully controlled and coordinated all Navy relief efforts and medical evacuation lifts during the disaster.

"Under his excellent leadership the Navy and Marine units employed in this operation succeeded in bringing a semblance of order in the stricken area and were responsible for saving many lives. Capt. Counihan's untiring efforts in the face of extremely chaotic conditions reflect great credit upon himself and the United States Navy."



**EL TORO'S NEW SKY-SCANNER** radar, the eyes of recently activated Radar Air Traffic Control Center (RATCC), sweeps the Southern California skies. It is located atop 4008' Pleasant's Peak, 12 miles northeast of the air station. Radar information from the mountain top is "piped" to the Center on the air station, which is jointly manned by FAA and Marine Corps personnel. The radar antenna, revolving six times a minute, has a surveillance radius of 200 miles.



# GRAMPAW PETTIBONE

## Hair Raiser

An accident that doesn't happen is usually the business of my friend Any-mouse, but Ol' Gramps just couldn't pass up this one about a quick thinkin' VR crew.

An R5D on a scheduled airlift took off at 0925 EST from Miami International Airport with 44 passengers and crew aboard, or, as they say in the trans-Atlantic business, 44 SOB. It was a beautiful day, weather perfect all the way, and they were flying a VFR flight plan.

At 1053 EST, they heard the Navy Sanford tower broadcast a blind flight advisory concerning a reported BOMB that had been placed aboard a military transport at Miami and due to detonate at 1100 EST!

The R5D had passed Daytona some time back, cruising at 9500 feet. A quick look around the area disclosed only an old WW II abandoned airfield below. While the copilot radioed NAS JAX for confirmation and got it, the pilot commenced an emergency descent. Passengers were ordered to strap in (most of 'em thought they were goners by now anyway) and were told that this was an emergency landing, and to get out FAST when told to do so.

Meanwhile the clock ticked inexorably on, subtracting minutes and seconds in a deadly count-down to the anticipated blast. The pilots pushed the nose over, diving for the aban-

doned field at the maximum rate of descent. In the race with time, wheels and flaps were lowered in a short final approach to what looked like a 5000-foot landing strip, but, as they crossed the threshold, the clock stood at 1100 EST. Roll-out and hard braking brought them to a stop at 1101 EST. All hands abandoned the big R5D post-haste as the engines were secured. Who knows when a bomb will let go?

Almost two hours later a helo ar-



rived with ordnance experts and a complete inspection was made of the entire aircraft and all baggage. No bomb! Nothing! Whew!

Immensely relieved, all hands boarded their now trusty aircraft and completed the rest of the journey uneventfully.



*Grampaw Pettibone says:*

What a clutch this musta been! Seems like they were the **ONLY** military transport out of Miami at the time! Kinda narrows it down. Never did find out who planted that rumor, but these lads were real **COOL** in handling the emergency. It pays to maintain a listening watch on that radio. VFR or not.

## Sweat Job

After completion of a night intercept hop, two F3H's returned to their home field for some night mirror-landing practice. Each had about 3000 pounds of fuel remaining on entry into the pattern. After three passes apiece, they were instructed to "dog it" to clear the pattern for an AD-7, coming in for an emergency landing with an electrical fire.

The wingman raised his landing gear but left flaps and slats down to remain in slow flight as they orbited. The stricken AD landed safely. The crash equipment, rotating beacons flashing, surrounded him on the runway as the pilot braked it to a stop.

At this point, the F3H leader declared a low fuel warning light and requested an immediate landing. The second F3H also declared a low fuel state with only 1100 pounds remaining, so the tower cleared both for landing on another runway since the duty runway was blocked.

Lights on the runway assigned were not turned on immediately and the F3H leader called for runway lights as he turned downwind. The tower replied by clearing him to land. The pilot said he would if he could find the runway—"Lights if you please." Lights came on as the leader hit the



90° position and the wingman the 180. The F3H leader landed without incident, and the wingman was now cleared to land.

The wingman called gear down and locked and then concentrated on his approach. He was paying particular attention to landing right on the numbers at the proper airspeed since it was a short runway and there was only three knots of wind. Further the angle-of-attack indicator and stick shaker had not been working properly on the previous touch-and-go's.

He touched down GEAR UP! The F3H porpoised violently three times and ground to a stop just off the side of the runway.

As the pilot blew the canopy open, he found the crash trucks deployed around him and a rescue man on the windshield ready to help him out.



*Grampaw Pettibone says:*

**Jumpin' Jupiter!** Ain't this typical? Seems like the only time an emergency occurs to close the runway is when everybody in the area is approaching low fuel state! That "one last pass and then I'll go in" thought can sure be a killer. When the situation is real tight and the red lights are glowin' is the time you'd better use a positive check-off list the mostest. With 1100 pounds left, the sweat shouldn't get too deep in the cockpit.

Incidentally, this crash crew now has Gramps vote as the "most improved" outfit on wheels anyplace.

## Sharp AD Driver

An AD5W was returning to a big CVS steaming somewhere in the Atlantic. The crew was relaxed after completion of a night radar mission. It was approximately 0400 and had been an inky black night.

They were only a short distance from the CVS when the otherwise routine flight suddenly changed to a nightmare. The engine began to surge uncontrollably between idle and full power!

With two crewmen aboard whose lives depended on his decision, the pilot considered the possibilities; a night ditching in the cold Atlantic, or an arrested night landing on the angled deck of the CVS, cutting the mag switches or fuel off on final approach with a deadstick touchdown. Either one seemed hairy, but he chose to attempt the arrested landing.



*Tower! I'm real low on fuel; I've got my gear DOWN.... Give me lights!*

The pilot contacted the ship, informed them of his difficulty and rapidly dwindling fuel state and was told he would have a ready deck after one S2F, also having difficulty, was recovered. The S2F got aboard on his third pass, but hit hard, collapsed a main landing gear and laid there like a dead bird, fouling the deck! The AD5W continued to hold in the Dog pattern, surging engine, low fuel state and all.

The CVS crew did a fast job of clearing the deck, and the AD pilot was finally told he had a ready deck.

On the first pass, the AD-5W came around too fast. Although the pilot cut the fuel as he approached the ramp, he was obviously too fast to even touch down, so he turned the fuel back on again and the wind-milling engine caught with a full power roar for a waveoff! A second approach resulted in an early go-around due to excessive speed.

The engine now began to reduce power of its own accord. Our young pilot made a third approach to the angled deck. This one was right on the money, although a trifle fast. He cut the fuel off just short of the ramp, touched down smoothly on the dark deck, caught a wire and came to a smooth, normally arrested stop. The pilot and his two smiling aircrewmembers emerged unscathed from their ordeal.



*Grampaw Pettibone says:*

**Pop my buttons!** This lad has got what it takes! Cast iron guts, brains, and skill are a combination that's mighty hard to beat. Betcha this pilot has a waiting list of men who want to join his crew. I'm adding his name to Gramps' "Real Pro's Roster."

## Close Shave

An A3D returning from a night training hop crossed the ramp of a big CVA with the meatball right on the money. The hook picked up number two wire after the touchdown and the arrestment seemed normal. Suddenly the wire BROKE, and the big plane lurched forward with full power on—but SLOW! As the A3D cleared the flight deck, the pilot cleaned up his landing gear and concentrated on holding his attitude and airspeed. All three men aboard held their breath as they watched the altimeter unwind.

The A3D shuddered as it spanked the water. The pilot gently eased the yoke toward him as the fuselage lightly slid through the dark water. After a few seconds, the A3D broke free of the water and climbed swiftly.

Vectored by the carrier, they flew to a nearby island airfield and made a safe landing. Inspection of the A3D revealed that the underside of the fuselage aft of the bomb bay door and the port engine nacelle had been dragged through the water. The LSO logged the narrow squeak as an arrested landing, a bolter, and a water touch-and-go.



*Grampaw Pettibone says:*

**Fetch me another aspirin tablet!** How close can you get to wet feet? This pilot is a cool one, but if he has many more like this, I'll have to check for the competition before I unlimber one of my tall tales at any "Happy Hour" where HATWing One is represented.

Just goes to prove you ain't got an accident till she smashes to a stop, so keep flyin' it.

You may luck out. This one did.

# FLEET CPO'S HEAR ADMIRAL

VADM. GEORGE W. Anderson has asked more than 700 Sixth Fleet Chief Petty Officers for their help in meeting the "greatest threat our nation has ever faced."

The Sixth Fleet Commander spoke to the assembled chiefs from 28 ships aboard the carrier *Saratoga*. He summarized the current communist threat and outlined the CPO's collective responsibilities as Navy leaders and American citizens.

The unprecedented meeting of more than half of all Sixth Fleet chiefs took place during a Fleet conference at an isolated anchorage in the western Mediterranean. It was one of the rare times that so many Sixth Fleet ships had assembled in one place.

Emphasizing the scope and complexity of communist activity, VAdm. Anderson asked for greater effort in strengthening the United States. "It is not just a military threat," he said. "Your leadership and example in moral and spiritual matters are needed just as much."

Saying the average age of enlisted personnel in the Fleet is only 23 years, he told the chiefs that they were the people who exercised the most vital influence on the younger men and that they bore the primary responsibility for directing these men in the Navy.

He asked for a continuation of the guidance and assistance that experienced CPO's traditionally have given to young division officers.

A tendency of some personnel to accept responsibility only on a 40-hour-week basis was scored by the Admiral. He told the men they must provide leadership and guidance all the time. He urged them not to limit themselves only to their own divisions, or their own ships, or only during duty hours. "If you do, your leadership will not be available when it is needed most," he said.

The insidious thing about many communist efforts is that they feed on frailties of human nature, he said. He reminded the listeners that the communists are always quick to use greed, lust, laziness and ignorance for subversive purposes. He urged the chiefs to keep their men on guard at all times.

"I am proud that Americans traditionally have had the qualities of

honor, determination, self respect, pride and dignity," said the Sixth Fleet Commander. "Pass these on to your men. Instill confidence and a tougher moral fiber in them. Help them meet the challenge of the future. It is your future, too, and the future of your children and grandchildren."

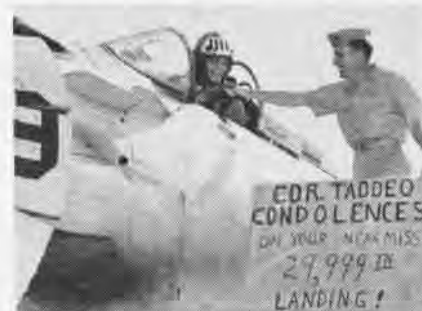
Reminding them that technological advances have neutralized former advantages of having oceans and buffer nations between the United States and aggressors, Adm. Anderson described the Sixth Fleet as being a substantial and vital contribution to world peace. He thanked the chiefs for their part in making the Fleet the most powerful of all the world's navies.

## VX-6 Has 8 Aircraft Types All in Antarctic at the Same Time

Air Development Squadron Six had at least one of every type aircraft it possesses on the ice at McMurdo Sound, Antarctica, at one time in November.

There were the R7V *Super Connie* which shuttles passengers and cargo in from New Zealand; four C-130BL *Hercules* cargo planes which lift heavy payloads from McMurdo to inland stations; one R5D which is used both for delivering personnel and for aerial photo reconnaissance; three P2V-7 *Neptunes* which do photo work and make logistics flights; one R4D-5 of the type which landed the first Americans at the South Pole; three R4D-8's and four UC-1 DeHavilland *Otters*, which fly medium and short-range logistics missions, and two HUS-1A helicopters.

Newest in service is the C-130BL. The R4D-5 is the oldest type in use.



**ONE SHY ON 11!** The ancient and honorable tradition of commemorating 1000th landings is given new slant as Cdr. Al Taddeo, VA-52 C.O., gets a novel welcome aboard by Cdr. A. E. Sloan, *Ticonderoga's* Air Officer.

## FAI Committees to Meet VAdm. Pirie to be U. S. Delegate

Standing committees of the *Federation Aeronautique Internationale* (FAI) will hold its annual meetings in Paris shortly. VAdm. R. B. Pirie, DCNO(Air) will represent the National Aeronautics Association on two committees.

Regular committees include Helicopter Committee, Acrobatics Committee, Ballooning Committee, Secretaries General, Air Touring Committee, Statutes Committee, and the FAI Board. In addition to the older committees, a new space-age committee for Records with Rockets will meet in the office of the FAI Director General, H. R. Gillman, on 6 March. This committee will work on rules for the class records under the four world records for space flight approved at the FAI conference in Barcelona, October 1960.

The Navy is well represented on the U.S. delegation. In addition to VAdm. Pirie, scheduled to be a delegate to the meetings of the Touring and Statutes Committees (10-13 February), VAdm. D. E. Rosendahl, USN (Ret.), will serve on the Ballooning Committee, and Capt. Cook Cleland, USNR, is slated to be a member of the Acrobatics Committee.

The U.S. representative of the FAI is the National Aeronautics Association whose president is Miss Jacqueline Cochran, the famed aviatrix.

## Brazilians to Train in ASW AF Personnel Report to Key West

Officers and enlisted personnel of the Brazilian Air Force are in NAS Key West, Fla., for an extensive, six-month course in antisubmarine warfare techniques.

Some came directly from Brazil and others reported from U.S. Navy schools in various areas of the United States where they received specialized training in maintenance procedures and ASW tactics. About 250 men will ultimately be trained at Key West.

They will receive operational flight training in Grumman S2F *Trackers* and Sikorsky HSS helicopters which have been transferred to Brazil under the Military Assistance Program. The aircraft bear Brazilian identification markings.

Training is being conducted by Carrier Antisubmarine Air Group 50 commanded by Cdr. John M. Weeks.



# FIFTY YEARS OF NAVAL AIRCRAFT



**T**HE A3J-1 *Vigilante*, shown above completing its first carrier arrestment, represents the learning of 50 years of partnership between the Navy and the aircraft industry—with many an assist from other segments of government and industry. One of the best among the aircraft currently being readied for service by the Navy, such as the HSS-2, the F4H-1 and the A2F-1, the A3J-1 illustrates the many aspects that have always been hallmarks of Naval aircraft.

The A3J-1 combines equipment and knowledge representing the most advanced state of the art reduced to service use in the fields contributing to present day aircraft—aerodynamics, propulsion, electronics, materials, etc. And it combines these to make possible a mission unattainable with any other current aircraft—delivery under all weather conditions of nuclear or conventional weapons at supersonic speeds and the long ranges possible in operating from our carrier task forces against potential enemy targets.

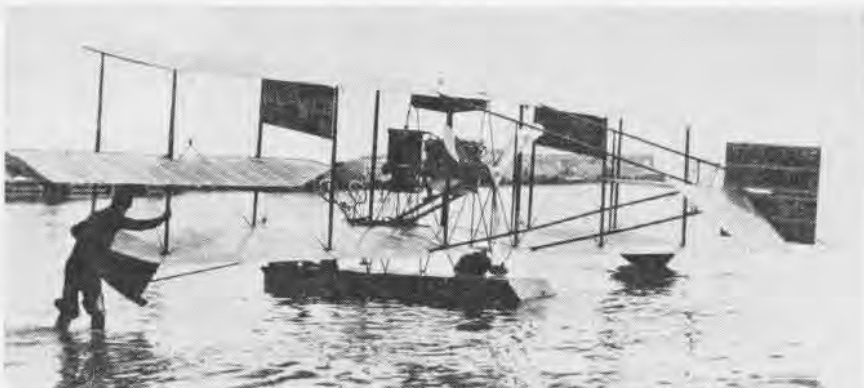
The A3J-1 is only one in a continuing line of naval aircraft, beginning with the early pusher type biplanes, whose development has gone hand in hand with the overall development of Naval Aviation. While the airplanes are only one of the ingredients that have made possible our attack and antisubmarine operations of today,

they serve best to illustrate the great strides that have been made in 50 years.

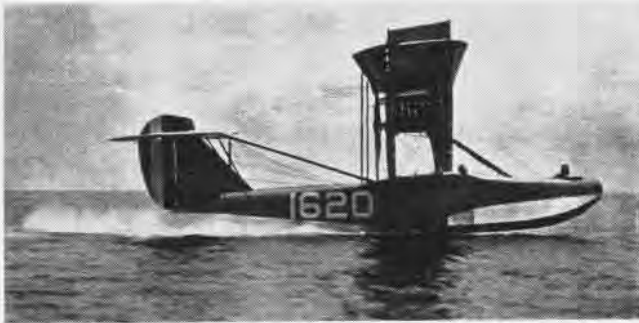
Navy's early aircraft were purchased basically as types offered by the fledgling aircraft builders, though from the beginning emphasis was placed upon features to make them more useful for Navy operations, such as the combined water and wheel landing gear of the Curtiss A1. These early types were used for the many jobs of readying an aviation force to operate with the Fleet—training pilots, testing equipment for possible use (radios, bombs, guns, catapults) and working out techniques, such as opera-

tions from ships, scouting for the Fleet, etc.

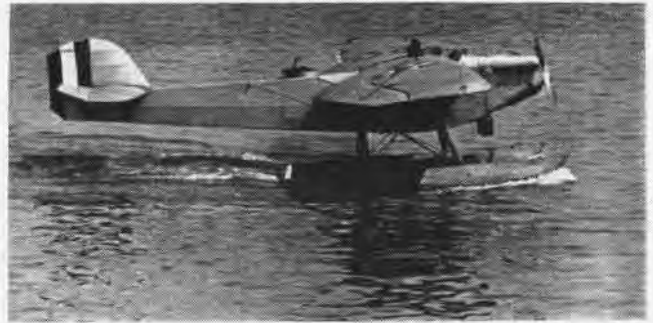
With the U.S. entry into World War I, the German submarine threat defined the prime operational aviation mission for the Navy to be antisubmarine patrol. Available types, with necessary modifications, were placed in production, and aviation personnel were trained as part of America's mobilization. As operations began, design of new types of aircraft was dictated; patrol planes of increased range, such as the famous NC boats, and fighters to offset the threat of the German seaplane fighters against our patrol planes. Other avenues of development



**IN THE EARLY DAYS** of Naval Aviation, Curtiss Pushers, such as this one at Pensacola, were used for training pilots, for operations with the Fleet, and for testing planes on missions.



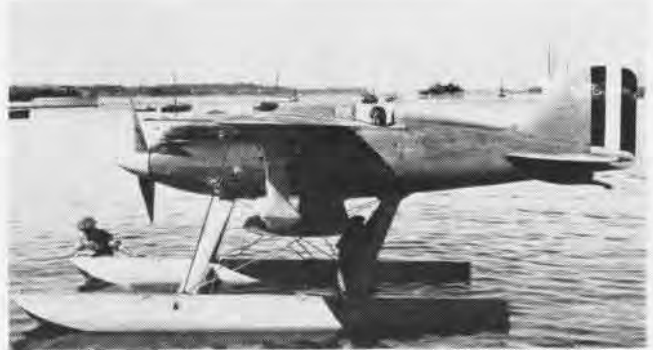
**BEFORE CARRIERS** became a reality, water-based aircraft were the Navy's mainstay. The HS-2L, left, was typical of types flown in



WW I. Postwar types were often convertibles (designed for floats or wheels), such as the cantilever monoplane Martin MO-1 at right.



**THE RACING PLANE** program of the early Twenties advanced the development of high-powered engines and of airplane design for higher



speeds. The CR-1, left, was the first of the Navy racing types, the R3C-2, at right, was one of the last and most successful of all.

were also followed where they gave promise of providing increased aviation capability; emphasis was generally on water based aircraft.

With the Armistice, the pace of Naval operations slowed to peacetime level but development of new aircraft continued unabated. A reawakened interest in ship-based aircraft, and efforts to put to use the many developments in aircraft construction made among the various countries during WW I, contributed to the appearance of a large number of new designs over the following years. Some attempted too big a leap and were not successful, but the lessons learned were made available for other new designs. Money limitations prevented putting many of these in production, and service operations for several years were conducted in modified and modernized WW I types. While operations with the Fleet emphasized observation and long-range scouting missions, bombing and torpedo capability was also developed.

The formation of the Bureau of Aeronautics in 1921 created a single authority to direct and coordinate all aviation developments in the Navy. A more systematic approach to the development of an advanced prototype

aircraft program, already underway, was crystallized by BUAER. The Bureau itself laid out the basic design for many of these aircraft; detailed design and construction were accomplished by aircraft companies or the Naval Aircraft Factory.

Among the new types developed for the Navy during the early Twenties were such advanced types as the cantilever monoplane Martin MO-1. One of the early designs to feature all metal structure under its fabric covering, this was a convertible (wheels or

floats) observation airplane capable of being launched from shipboard catapults. It required the solution of major design problems, but production MO-1's did see service use.

Much more important to the subsequent advancement of Naval Aviation were two other concurrent BUAER-sponsored programs: the development of the radial air-cooled engine, and the development of the necessary equipment for carrier operations. The Navy had been emphasizing the large liquid-cooled engine suit-



**WITH THE INTRODUCTION** of the air-cooled Pratt & Whitney Vash engine, a number of new carrier-based designs, such as the Boeing XF3B-1 aboard the Langley, were developed in the 20's.



**NAVY HAS** generally depended on already developed transport aircraft. Thus Ford all-metal tri-motors, used by most U.S. airlines, were used as the JR (later RR) series. This JR-3 and its sisters were among Navy's first operational all metal cantilever monoplanes.

able for large, long-range scout and patrol planes. However, the operation of the carrier *Langley* dictated a new approach, and the air-cooled radial engine proved to be the answer. In ever increasing sizes, it became the

Navy-sponsored mainstay of almost all military aircraft, as well as civil transport aircraft until superseded by turbine powerplants.

Another special effort during the early Twenties was the racing aircraft

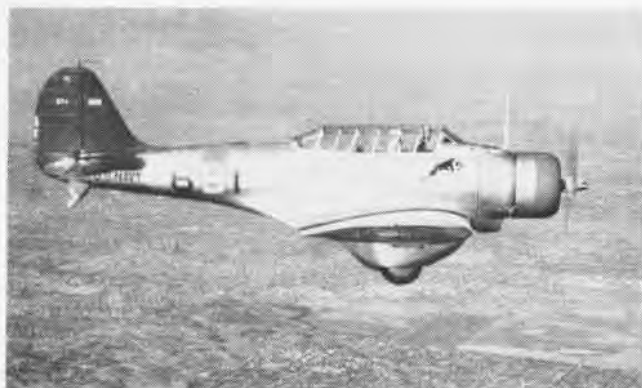
program, which greatly advanced the art of high speed aircraft design and produced a number of World and United States speed records. In many ways this program was not unlike that of the post-WW II high speed pro-



**THE OL-8** was one of the series of outstanding Loening amphibians. Their versatility for many operational and utility missions led



to less successful attempts to design new observation and scout planes as amphibians in early Thirties, including the Sikorsky XSS-2.



**EARLY MONOPLANE** types, such as the Northrop BT-1 dive bomber, served in Carrier Air Groups with the F3F-1 biplanes. Emphasis



on climb and maneuvering performance kept the Grumman biplane fighters in carrier squadrons until the eve of our entry into WW II.



**CONTINUING DEVELOPMENT** of flying boats for patrol squadrons led to Boeing XPBB-1 'Sea Ranger' of early WW II period. An outstanding design, its production was cancelled when WW II showed the need for land-based patrol aircraft to supplement seaplanes in production.

gram which produced the record breaking Douglas D-558 series airplanes.

The appearance of the P&W *Wasp* engine in 1926, followed by the *Hornet* and the Wright *Cyclone*, brought forth the first really effective carrier-based aircraft such as the Vought *Corsair* observation planes, Boeing and Curtiss fighters, and the Martin T4M torpedo and bombing planes. As these went into operation on the *Saratoga* and *Lexington*, the Navy sponsored new designs using such features as all-metal fuselage construction and the newly-developed cowlings to reduce the drag of the radial engines. New patrol planes were procured to replace the old WW I type F5L boats. These were based on the latest of the Naval Aircraft Factory series with all metal hulls and internal structure and the

new radial engines. Development of monoplane flying boats was also initiated.

The period of the mid-Twenties through the early Thirties saw the height of the Navy's use of amphibian type aircraft. Spurred on by the very successful Loening amphibian, projects were initiated to provide carrier-suitable scouting and observation amphibians. Grumman began its company history building amphibious floats for *Corsair* aircraft, along with other companies, and new amphibious designs were developed. However, by 1935 it was apparent that only for utility operations were the penalties of the amphibian outweighed by its obvious advantages.

Where possible, commercial types were purchased for use in transport and utility work. Thus such types as

the Ford and Fokker tri-motor transports joined the Martin P3M's as the primary monoplanes in service use during the early Thirties.

By 1935, all metal construction, retractable landing gears, wing flaps, cockpit canopies, and the new twin-row radial engines were incorporated in Navy aircraft. Experimental monoplane combat types were being tested, but the biplane held its place as the primary Navy carrier type for several more years. Strangely enough, the fighter biplanes were the last types to be supplanted, the F3F biplane series serving with the monoplane Northrop BT-1 and Vought SB2U series dive- and scout-bombers and the Douglas TBD-1 torpedo planes. Monoplane PBV's also replaced the earlier patrol boats. With the advent of the Brewster F2A and Grumman F4F fighters, the biplane



**THE AD-6**, typical of the AD's which are still a mainstay in carrier ops, was evolved from the XBT2D-1 of the WW II period. The



**Bell L-39-2**, a contemporary of the XBT2D-1, was used to study low-speed characteristics of sweptwing designs during that period.



**THIS FORMATION** of a WF-2, an AD, and a P2V, flying from NAF Sigonella, shows effect of electronic developments on aircraft con-



figurations. The HSS-2 at right combines the latest developments in helicopter design, gas turbine engines and avionics equipment.

finally left the ranks of the first line combat types—in 1941!

World War II saw the exploitation of the high-powered reciprocating engine monoplane configuration for all carrier-based types. Typical of the many developed in the closing days of the war was the Douglas XB7D-1 which still sees wide service today as the AD series.

As patrol operations were extended around the world, land-based patrol planes were obtained to join current designs of the more familiar water based types. Again the amphibian was seen to have operational advantages—the PBY series amphibians proved to be of great value in all theatres even though outclassed in performance by its more modern water and land-based contemporaries.

During the war three new developments made their appearance which were to have a profound effect on the trend of Naval aircraft design: airborne radar, the turbojet engine, and the helicopter. All the Navy's combat types of today show the impact of at least one of these developments. The HSS-2 with its turbine powerplant and sophisticated antisubmarine electronics system exemplifies all three.

Radar and subsequent advancements in electronics were adapted to existing aircraft and thus became a part of Naval Aviation in a rather straightforward manner. These were fully accepted long before the end of WW II, but the jet engine and the helicopter posed more difficult problems. In the case of the former, limitations in both the available engines and in carrier catapulting and arresting equipment dictated a cautious approach even



**WHEN FIRST** introduced, the Douglas A4D-1 countered trend toward greater complexity.

though the tremendous impact on fighter aircraft performance was obvious. Like the jet engine, the helicopter was in its infancy, and here also the potential advantages could not be realized until technical problems had been overcome.

By the time of the Korean action, both had found a place. However, the operational jets were still straight-winged in spite of the Navy's D-558 high-speed research program and early Navy efforts to investigate the low speed characteristics of swept wing airplanes using the Bell L-39's, special modifications of the Air Force WW II P-63 fighters. The helicopters had completely supplanted the cruiser and battleship-based scout seaplanes and were proving their worth for carrier plane guard and general utility duties.

In the years since, extensive efforts have been required to develop carrier equipment suitable for operating the continually advancing jet aircraft.

These have seen the adoption of the angled deck, the steam catapult, and construction of the *Forrestal*-class carriers. Just over the horizon is the nuclear-powered *Enterprise*, which will embody these improvements, and combine them with greater endurance.

Afterburner jet engines, coupled with aerodynamic, structural and control system advances, and new materials and manufacturing methods, have provided supersonic fighters for the Fleet. Air-to-air missiles and their necessary fire control systems have greatly increased the effectiveness of these fighters. Boundary layer control systems on the wings are now being incorporated to overcome the low-speed problems that plagued the early supersonic types.

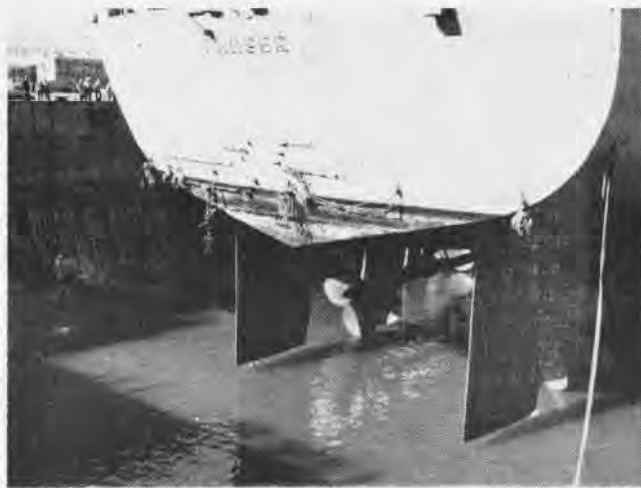
Concurrent advances, particularly in electronics, have resulted in the jet attack, the antisubmarine, and the airborne early warning aircraft operating with the Fleet today. Mid-air flight refueling techniques employing standard carrier types as tankers have been brought from the idea stage to service use, providing greatly increased flexibility for carrier air operations.

These developments have all had their effect on the design of the Navy's airplanes of today. As new advances are made in all the fields on which Naval Aviation depends, these will result in advanced aircraft developments which will further enhance the capabilities of Naval Aviation.

*This is the first in a series of articles covering the design trends of the various types of Navy aircraft. Subsequent articles will deal with a specific class of aircraft: fighters, attack, and others.*



DOCK LIGHTS STILL BURN AS RANGER ENTERS DRYDOCK AT DAWN



WEAR AND TEAR OF 50,000 MILES SHOWS IN PITTED PROPELLERS

## RANGER ENTERS YARD AT SAN FRANCISCO

SILENT SPECTATORS formed lines before dawn. They were not waiting for the world series to begin, nor for ducks to fly overhead. They were out to bear witness at a colossal wrestling match in San Francisco.

The opponents were the obstinate bulk of the USS *Ranger* and the men who sail her. Their job was to pin her to the blocks at the bottom of drydock Number Four and make sure she stayed put until the water ran out. Men had the advantages of intelligence and ability. These they matched against the lady's bulk and the currents.

### Bullpup B Being Tested It is Bigger, Better than Model A

The first of a new class of *Bullpup* air-to-ground missiles is off the assembly line and is being used in advanced tests. It is described as a "big brother" to *Bullpup A* which became operational in 1959.

No details of the new model *Bullpup B* were released, other than that it is larger and will have improved capability to destroy surface targets.

### Inoculations are Automated Memphis Sailors 'Shot' in Drive-In

At NAS MEMPHIS, hundreds of normally needle-shy Navymen, their arms bared, queued up by the carload in everything from sports cars to scooters to take part in what Memphis believes to be the military's first drive-in inoculation station.

The system was developed after the medics noted the poor response to their annual all hands call for protective shots, particularly on rainy days. So

the Navy doctors took a cue from the success of drive-in banks, movies, lunch counters, and set up the shot shop on an ambulance ramp at the station dispensary.

According to the people who thought up the system, drive-in flu shots were an immediate hit. "We can now handle as many as 700 persons an hour," reported one happy corpsman. The system not only eliminates congestion inside the dispensary, it also solves the parking problem.



CHIEF 'SHOT' IN DRIVE-IN AT NAS MEMPHIS

The contest lasted a little over three hours, and, as it turned out, man prevailed over mass and water. *Ranger* showed her petticoats for the first time in more than a year. The 22-foot propellers and giant rudders displayed themselves for a face-lifting.

The massive miss remained high and dry until well after the holiday season. The majority of the men who sailed her more than 50,000 miles on her last cruise were not unhappy that she was laid up, even if it was only for a few months. The maintenance period meant holiday leave.

As one customer put it: "Man, this doesn't take away any of the needle pain, but you can get away quicker."

### Marine Helo Lifts Terrier Delivery by Air Saves Man-Hours

An HR2S-1 helicopter from Marine Helicopter Transport Squadron 462 has proved the feasibility of re-supplying missile units by helicopter by lifting a *Terrier* missile in tests at Twenty-Nine Palms, Calif.

Earlier, the same model helicopter had lifted the *Hawk* missile in tests with the Army at Fort Bliss.

On four occasions during a three-day test period, the Marine helicopter lifted a fully assembled *Terrier* missile to resupply units of the First Medium Antiaircraft Missile Battalion.

Normally, artillerymen have to uncrate and assemble the two-part missile and deliver it by vehicle. The HR2S-1 lifted the entire 30-foot missile system already assembled and delivered it to the launchers ready for firing at a great man-hour saving.

# VIGILANTE GOES OVER TOP WITH 'BOMBLOAD'

**C**DR. LEROY A. HEATH of the Naval Air Test Center flew an A3J *Vigilante* to an altitude of 91,450.8 feet December 13, carrying a 1000-kilogram (2204.62-pound) payload. Lt. Larry Monroe was navigator.

The United States has filed a claim for a world altitude record for a land-based jet aircraft carrying a 1000 kilogram payload. The claim is pending before the *Federation Aeronautique Internationale*.

The North American Aviation plane exceeded by 24,354 feet or more than four miles the previously recognized

record of 67,096 feet set July 13, 1959 by a Russian pilot flying a twin-jet RV monoplane.

Secretary of the Navy William B. Franke awarded Commander Heath the Distinguished Flying Cross and Lt. Monroe the Air Medal.

Cdr. Heath's carefully controlled flight pattern was followed by altitude-registering radars on the ground which were monitored by officials of the National Aeronautical Association, U.S. representative of the FAI.

Altitude also was calibrated by a barograph carried in the plane to meas-

ure and record air pressures from which altitude could be determined.

FAI rules require that the plane contending for this record carry a 1000-kilogram payload in a compartment measuring at least 141 cubic feet. The *Vigilante's* payload on the record flight was carried in the plane's tunnel-like linear bomb bay.

The all-weather *Vigilante* is undergoing evaluation by the Navy before being assigned to the fleet. It is powered by two GE J-79 engines, and it can deliver nuclear or conventional weapons at twice the speed of sound.



CDR. HEATH AND LT. MONROE BOARD A3J-1



CAREFULLY WEIGHED 'BOMBLOAD' IS READIED FOR FLIGHT TO A HEIGHT OF 17 MILES



THE WORLD'S FIRST nuclear-powered aircraft carrier, USS Enterprise, is moved to new berth at Newport News after launching in September.

The new carrier, christened by Mrs. William B. Franke, wife of the Secretary of the Navy, will be ready for Fleet operation in 1961.

# THE 1960 NAVAL AVIATION REVIEW

IN 1960, Naval Aviation completed the 49th year of its existence and entered its golden anniversary year. Although its forces were not called upon for special operations to nearly the extent of other years, repeated threats to world peace kept international tension high enough to require augmentation of forces overseas and a number of alerts which sent fleet units out to sea or put them on short notice for ready deployment. Against this background, there was improvement in naval air weapons and in the manner of their employment, a readjustment of programs and of organization, and a general strengthening of the operating forces.

Carrier-operating capabilities were improved by the completion of the last ship scheduled for major conversion under the program to modernize carriers of World War II design. Future operating potential was enhanced by the launching of three new carriers including the nuclear-powered *Enterprise*. A contract for the construction of a new carrier of the *Forrestal*-class was let. A carrier early warning plane and an all-weather interceptor were delivered to the Fleet. A new high performance fighter passed its carrier trials early in the year and later surpassed two world records with speeds in excess of 1200 miles per hour. A new carrier attack plane completed its initial carrier trials and then bettered the existing world altitude record for planes with payload by almost five miles. A plane designed for high and low altitude attack made its first flight. A new carrier early warning and interceptor control aircraft made its first flight and was considered significant enough to warrant the ceremony of formal acceptance.

The interceptor and close support missile picture re-

mained stable with no basic change of operational assignment and no termination in the production of operational types. Development of air-to-surface missiles was readjusted toward those of broader operational potential. The fleet ballistic missile went to sea in an operational status as scheduled, and work on the missile itself was advanced by tests of a longer range model and the award of contracts for research and development of a still longer range type.

Establishment of a new Defense Force brought the anti-submarine organization of the Pacific Fleet on a parallel with that of the Atlantic. Reorganization of aviation units assigned to this mission was completed with the formation of ASW carrier groups and replacement units set up in a pattern similar to that provided for attack carrier aviation in the previous year. A new model of the operational ASW carrier plane, featuring longer range and more refined electronics system, made its first flight. An experimental drone helicopter designed for employment from destroyers made its first unmanned flight.

The Navy Space Surveillance System made the world's first detection of, and later identified, an unknown man-made satellite. Fleet Weather Central began providing cloud cover data obtained from the weather satellite. Navigation by fixes obtained from satellites was found to be not only feasible but more accurate than the established method and unaffected by cloud cover and weather. Project *Mercury* was given Navy assists as a Navy helicopter recovered the first capsule ejected from orbit, and the human centrifuge facility at Johnsville completed another training program for astronauts and the medical support personnel.





LTCOL. T.H. MILLER, USMC, piloted F4H at record speed for 500 km.



CDR. L.A. HEATH (right) and Lt. H.L. Monroe took the Vigilante to a record altitude for jet aircraft with a 1000 kilogram payload.



CDR. J.F. DAVIS flew the Phantom II on a record run for 100 km.

*As the year began, one naval officer was under flight instruction. Newspapers headlined the landing of an airplane on a Navy warship and reported the lights of a seaplane from waters around North Island. Congress appropriated twenty-five thousand dollars for Navy experimental work in aviation. The year was 1911. The events were firsts in aviation history and the humble beginnings of United States Naval Aviation—an interesting contrast to the events of 1960.*

#### JANUARY 1960

6—Edward O. McDonnell, VAdm. (Ret) and Naval Aviator No. 18, was killed in an airliner crash.

15—The Naval Weather Service Division was transferred to the staff of the Vice Chief of Naval Operations, and an Office of the U. S. Naval Weather Service was established as a field activity under CNO.

20—First of the WF-2 carrier early warning aircraft was delivered to VAW-12 at Quonset Point.

21—A fully fueled A3B, piloted by LCdr. Lloyd Smith of VAH-6, was catapulted from the USS *Ranger* at anchor in San Francisco Bay, aided by a 17-knot wind.

22—The CV-1 made its first flight at Dobbins AF Base, during which it also simulated a refueling operation.

25—The USS *Coral Sea*, CVA-43, was recommissioned after major conversion at the Puget Sound Naval Shipyard.

26—In an operation sponsored by the National Science Foundation and the Naval Research Laboratory, the first of two giant balloons was released from the *Valley Forge* in the Caribbean. Almost 50 stories high and with a cubic capacity greater than that of the rigid airship *Akron*, the balloon carried 2500 pounds of instruments to above 20 miles where it floated 2 days recording cosmic ray data.

During the month MCAF FUTUREMA, Okinawa, was established; Electronics Countermeasures Squadrons were redesignated Fleet Air Reconnaissance Squadrons, VQ.

#### FEBRUARY

2—The Navy Space Surveillance System discovered an unknown object in orbit and later identified it as the re-entry vehicle of *Discoverer V*, earlier presumed lost.

8—Air operations of *Deep Freeze '60* ended with the departure of seven Air Force C-130's from NAF McMURDO.

15—Carrier trials of the F4H-1 *Phantom II* fighter began on board the USS *Independence*.

16—The F8U-2N all-weather fighter made its first flight at Hensley Field, piloted by John Konrad of Vought.

29—Adm. R. L. Dennison relieved Adm. Jerauld Wright as Commander of the United States Atlantic Fleet.



THE USS HALIBUT, SSG(N)-387, fires the Regulus I bombardment missile in training exercises off Oahu. This was the first firing of a

guided missile from a nuclear-powered submarine and another in a series of firsts marked up by the missile since its initial firing.



THE BULLPUP air-to-surface missile is fired from an HUS-1 Marine Corps helicopter in a series of tests conducted at NATC Patuxent.

29—Navy and Marine Corps personnel from Port Lyau-  
tey were flown to the Agadir area of Morocco to aid in-  
habitants of the city razed by a severe earthquake. Relief  
operations became a Navy-wide effort in which units from  
many areas sent food and clothing to the stricken people.

During the month Fleet Air Gunnery Unit, Pacific was  
decommissioned, and VW's 12 and 14 merged with Air-  
BarsRon 2 to form Air BarsRon, Pacific.

### MARCH

1—Antisubmarine Defense Force, U. S. Pacific Fleet, was  
established under command of VAdm. John S. Thach.

7—VAdm. Charles D. Griffin relieved VAdm. Frederick  
N. Kivette as Commander Seventh Fleet.

8—The USS *Essex*, CVA-9, was reclassified as a CVS.

15—A test version of the *Corvus* air-to-surface missile  
was fired from an A3D at the Pacific Missile Range and  
successfully completed its first guided flight.

15—VAH-8 made a 4800-mile flight of nine A3D-2's  
from the carrier *Midway*, north of Wake, to Whidbey  
Island, refueling in the Hawaiian Islands and at Alameda.

25—The USS *Halibut* fired a *Regulus 1* during training  
exercises off Oahu—the first launch of a guided missile  
from a nuclear-powered submarine.

26—During Exercise *Blue Star*, elements of the First  
Marine Aircraft Wing established an operational air strip  
on Taiwan within seven hours of landing. The 3400-foot  
strip was surfaced with expeditionary airfield matting and



THE A3J Vigilante carrier attack plane on a touch-and-go landing during its carrier trials on the USS Saratoga early in the year.

equipped with arresting gear, landing and navigation  
systems, tower control, and a portable fuel tank farm.  
A4D's took off with Jato; F4D's, F8U's with afterburners.

During the month, NAAS NEW IBERIA was commis-  
sioned, MCAAS BEAUFORT was redesignated MCAS, and  
FASRons 9, 12, 51, 111 and VX-3 were decommissioned.

*In the second quarter of 1911, there was no  
room for aviation in the Office of the Aid for Op-  
erations and the officer-in-charge set up his desk  
first with the General Board and two weeks later  
in the Bureau of Navigation. From there, the first  
orders were placed for naval aircraft—one Triad  
built to operate from either land or water, one  
landplane, and one low-powered landplane for  
training. At the end of June prospective Naval  
Aviator No. 3 reported for flight instruction.*

### APRIL 1960

1—Antisubmarine Carrier Groups, CVSG-53 and 59,  
were commissioned at North Island. This marked the  
initial implementation of a plan to reorganize antisub-  
marine aviation by the formation of nine CVSG's and the  
assignment of an additional CVSG and a patrol squadron  
in each ocean Fleet to perform functions paralleling those  
of the existing Replacement Carrier Air Groups.

13—The navigation satellite, *Transit 1B*, was placed in  
orbit by a *Thor-Able Star* rocket launched from Canaveral.

19—The A2F-1 *Intruder* made its first flight.

During the month, VS-29 and VS-33 were commissioned.

### MAY

1—Seventeen Basic Training Groups of the Training  
Command were redesignated Training Squadrons, VT, and  
commissioned as separate units.

21—The USS *Kitty Hawk*, CVA-63, fifth of the *For-  
restal*-class carriers and first equipped to operate *Terrier*  
anti-air missiles, was launched at New York.

In May, CVSG's 54, 56 and 60, and VS's 22, 24 and 34  
were commissioned; FASRon 105 was decommissioned.

### JUNE

1—Detachment Alpha of VF-101 was activated at NAS  
OCEANA to conduct F4H transitional training for the At-  
lantic Fleet and train Radar Intercept Officers.

2—The air support missile *Bullpup* was successfully  
fired from an HUS-1 helicopter piloted by Capt. Samuel



THE F4H-1 Phantom II, breaker of two world speed records at set  
distances, during carrier suitability trials on USS Independence.



**PIPER AZTEC UO-1**, five-place, lightweight utility aircraft, was ordered in February.



**THE GRUMMAN W2F** carrier early warning and interceptor control aircraft on its first flight. The new plane is powered by two T-56A8 Allison turbo-prop engines and carries a crew of five.

Fulton of the U.S. Marines at NATC PATUXENT RIVER.

**10**—The Aviation Guided Missileman rating was disestablished and the functions assigned to the Aviation Ordnanceman and Aviation Fire Control Technician ratings.

**21**—The frigate *Norfolk* fired an antisubmarine rocket missile *Asroc* in a public demonstration marking completion of a two month technical evaluation program.

**22**—The *Transit IIA* navigation satellite was put into orbit by a *Thor-Able Star* rocket fired from Cape Canaveral. A second satellite designed to measure radiation was separated from the parent body when orbit was achieved.

**30**—Naval Aviation completed the safest year of its history with 1.9 aircraft accidents per 10,000 hours.

In June, NAF KEFLAVIK, CVSG's 50, 51, 52, 58, VS's 28, 41, VP's 30, 31, and HS-10 were commissioned; FASRons 3, 4, 102, 106, 107, 110, 114, 117, and VW-3 were decommissioned.

*The first day of the third quarter, 1911, the Navy's first airplane made its first flight piloted by a naval officer. Next day it was used by that officer in qualifying for a pilot's license and the following evening made the Navy's first night flight. At the quarter's end, aviators at Hammondsport, N. Y., and Dayton, Ohio, were under orders to assemble at Annapolis to set up an aviation camp.*

#### JULY 1960

**1**—An experimental OSN-1 made an at-sea landing on board the *USS Mitscher* in a successful demonstration of

the operating capabilities of a drone helicopter designed for use from destroyers in combating submarines. Although the drone was manned by a safety pilot, the entire operation except the final let-down was completed by remote control.

**1**—A facility was established on Eniwetok in the Marshalls to support operations of the Pacific Missile Range.

**9**—The *USS Wasp*, CVS-18, with elements of CVSG-52 on board, sailed from Guantanamo for the coast of Africa to support United Nations' efforts in settling disorders in the newly independent states of the Congo and to deliver aviation fuel for the UN air lift.

**18**—*Corvus* air-to-surface missile program was terminated to permit emphasis on systems offering broader use.

**20**—A *Polaris* ballistic missile was launched from an underwater position for the first time from the *USS George Washington* while running submerged off Cape Canaveral. The missile broke clear of the water, ignited in the air, and streaked more than 1000 miles down the Atlantic Missile Range toward its target.

**21**—The Navy announced selection of Douglas Aircraft Corporation to develop the *Missileer*, the launcher aircraft for the *Eagle* missile system.

In July VRC-40 and HU-4 were commissioned and GMSS-2 was redesignated Utility Squadron Eight.

#### AUGUST

**4**—The Navy accepted the first of four Lockheed C-130BL *Hercules* aircraft for VX-6 use in *Deep Freeze*.

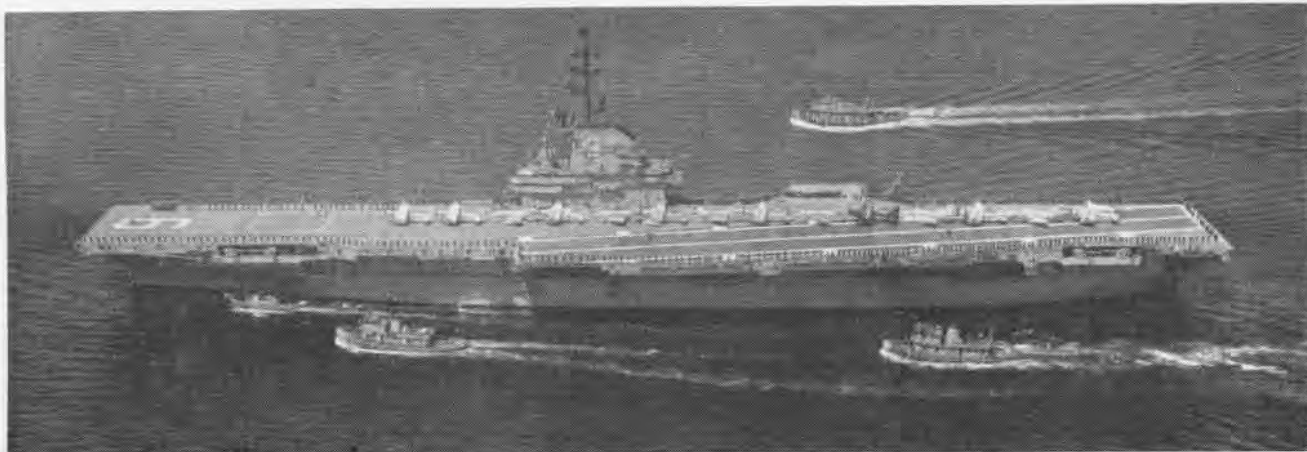
**11**—A Navy HRS-3 helicopter operating from the *Haiti*



**F8U-2N** all-weather fighter, made its first flight in February and was delivered to the Flight Test Division, Patuxent River, in June.



**THE NAVY'S** first C-130BL *Hercules*, procured for use by VX-6 in *Deep Freeze*, arriving at NAS Quonset for acceptance ceremonies.



**NUMBER NINE**, the USS Essex, mans the rail upon arriving at NAS Quonset Point in May. Reclassified as a CVS two months earlier, after more than 17 years of service as an attack carrier, the Essex no longer operates the plane types shown here lined up on her deck.



**RETURN OF** the USS Coral Sea to blue water after almost two years in the yard for major conversion is marked by a special formation on deck. Her return marked the completion of a ship modernization program for carriers of World War II design that started in 1947.

Victory of the Pacific Missile Range, recovered the instrumented capsule discharged by *Discoverer XIII* about 330 miles northwest of Honolulu. It was located by Air Force planes which guided the ship to the spot. This was the first recovery of an object after it had been in orbit.

**16**—The announcement of units earning the annual CNO Aviation Safety Award, cited one Air Group, 35 squadrons, three ships and one station of the Navy, Marine Corps and the Air Reserve for outstanding achievement.

During August Naval Air Rocket Test Center, Lake Denmark, was decommissioned.

#### SEPTEMBER

**2**—Capt. Holden C. Richardson, Naval Aviator No. 13, died at Bethesda. A man of many attainments, he was the Navy's first engineering test pilot, a pioneer designer of flying boat hulls, and an original member of NACA.

**5**—An F4H-1 piloted by LCol. Thomas H. Miller, USMC,

bettered the 500-kilometer world speed record flying 1216.78 mph over a closed course at Edwards AFB.

**6**—The Navy announced the winners of the Arnold Jay Isbell Trophy for excellence in antisubmarine warfare, naming VP-18, VP-49, VS-22, VS-32 and HS-9, Atlantic, and VP-28, VP-48, VS-37 and HS-2, Pacific.

**17**—The USS *Iwo Jima*, first amphibious assault ship designed as such, was launched at Bremerton, Washington.

**21**—The first of four Piper *Aztecs*, 00-1, was assigned to VT-6 at NAAS WHITING FIELD for evaluation as instrument trainers for the Naval Air Training Command.

**24**—The nuclear-powered carrier, USS *Enterprise*, was launched at Newport News, Virginia.

**25**—An F4H-1, piloted by Cdr. John F. Davis, averaged 1390.21 mph for 100 kilometers over a closed course, bettering the existing world record by over 200 mph.

During the month, Carrier Air Group 16 and its component squadrons VF's 161, 162, VA's 163, 164 and 165

were commissioned; Guided Missiles Group 1 was decommissioned.

*In the last quarter of 1911, the entire aviation element—three airplanes and three pilots—was operating from Navy ground at Greenbury Point, Annapolis. Two pilots made a flight of 112 miles in 122 minutes that was hailed as a long distance record. The first airplane modification was completed as the Wright was equipped with pontoons. Pontoons were under scientific test; experiments with airborne wireless were underway. The fourth naval officer reported for flight instruction. As the year closed, the Annapolis unit was preparing a move to North Island for winter operations.*

#### OCTOBER 1960

4—An R7V-1 of VX-6, piloted by LCdr. D. L. Reckling and carrying RAdm. D. M. Tyree as passenger, landed at NAF McMURDO SOUND to begin *Deep Freeze '61*.

8—The USS *Constellation*, sixth ship of the *Forrestal*-class, was launched at the New York Naval Shipyard.

14—The field at NAS JACKSONVILLE was dedicated as John Towers Field in honor of Adm. J. H. Towers, Naval Aviator No. 3 and outstanding leader in Naval Aviation.

20—The Department of Defense announced establishment of an Army-Navy-Air Force program to develop a prototype of vertical take-off and landing aircraft for the purpose of testing its suitability for air transport.

21—The W2F, a twin turbo-prop early warning and interceptor control aircraft designed to operate from carriers, first flew, piloted by Tom Attridge of Grumman.

#### NOVEMBER

9—An *Aerobee-Hi* rocket, fired from the White Sands Missile Range by Naval Research Laboratory scientists, soared 131 miles into the air to collect data on ultraviolet radiation in the night sky.

17—At the request of the countries involved, President Eisenhower ordered a naval patrol off Central American waters to intercept and prevent any Communist led invasion of Guatemala and Nicaragua from the sea. The patrol was carried out by a carrier and destroyer force which remained in the area until recalled on 7 December.

25—The Navy announced award of a contract to the Newport News Shipbuilding and Drydock Company for the construction of CVA-66, a carrier of an advanced *Forrestal*-class design authorized by Congress in the 1961 shipbuilding program.

#### DECEMBER

13—An A3J *Vigilante* piloted by Cdr. Leroy A. Heath and with Lt. Henry L. Monroe on board as bombardier-navigator, reached 91,450.8 feet while carrying a 1000 kilogram payload over Edwards AF Base, Calif. This performance surpassed by almost five miles the existing world altitude record for jet aircraft carrying over a ton.

19—Fire broke out on the hangar deck of the USS *Constellation* in the last stages of construction at the New York Naval Shipyard. Reports list 50 dead and estimated the damage at 45 million.

20—In special ceremonies at the Glenn L. Martin plant marking the close of the company's business in aircraft production, the Navy accepted a P5M-2 flying boat, the 2309th plane built by Martin for the U.S. Navy since 1915.



POLARIS ballistic missile starts down the Atlantic Missile Range on first launch from the USS *George Washington* submerged at sea.



ASROC antisubmarine missile, featuring a homing torpedo, is fired from USS *Norfolk* during technical evaluation tests off Key West.



DESTROYER PROVIDES STAYING POWER FOR HUNT AND KILL



TA



USS RANDOLPH SUCCEEDED THE VALLEY FORGE AS ALFA FLAGSHIP AND PLATFORM FOR S2F'S, HELOS, EARLY WARNING AIRCRAFT

**T**ASK GROUP ALFA was formed nearly three years ago to combat the threat of enemy attack from beneath the sea. The threefold problem involved, first, a program of team development in which crewmen of surface ships, air units and killer submarines could work together; secondly, the development of better tactics to seek, find and kill unidentified submarines; thirdly, putting into use the new ASW equipment as it came from test tubes and work benches. So great has been progress that *Alfa* now is one of four such groups.

This photo essay of *Alfa's* typical workday shows the men, ships, planes, and the ASW training followed in *Alfa's* efforts to guarantee that enemy submarines are found and dealt with before they come within striking distance of the nation, or before they reach a point from which they could launch a missile attack. Photos were provided by publisher H.G. Roebuck and Son, Garden City, New York.

OPERATIONAL IMMEDIATE

FROM COMASDEFORLANT TO CTG 81.8 X AIRLINE

PILOT REPORTS SIGHTING PERISCOPE ADJACENT

YOUR AREA X INVESTIGATE AND REPORT

# SK GROUP ALFA



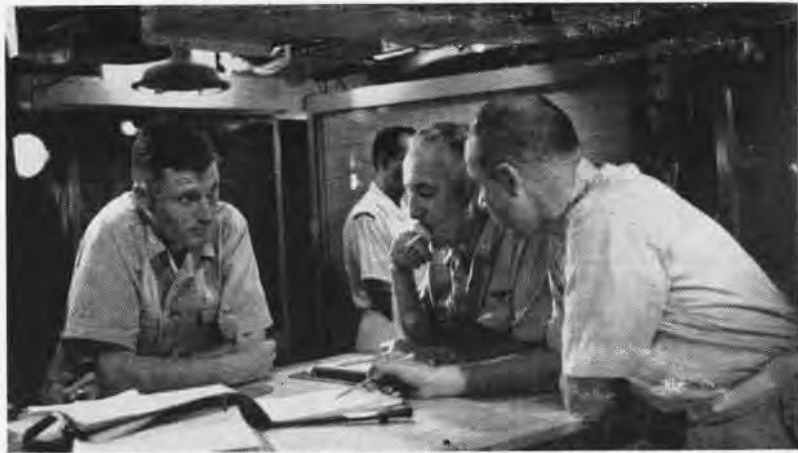
FLAG OFFICE OF THE RANDOLPH IS A BRISTLING BEEHIVE OF ACTIVITY



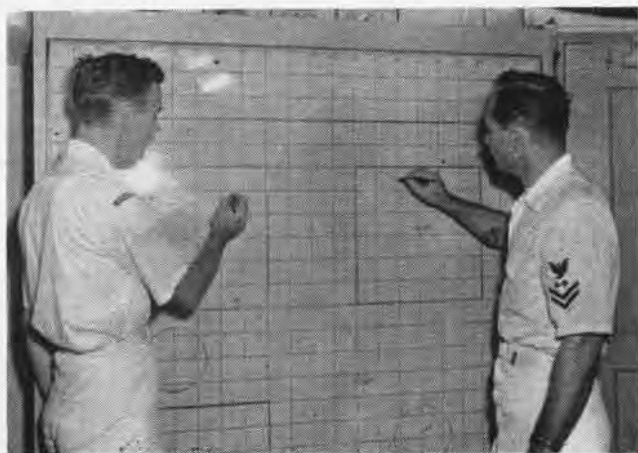
SONAR OPERATOR LOCKS ON UNDERSEA TARGET



STAFF WATCH OFFICER DIRECTS GROUP



RADM. J. E. CLARK PORES OVER PROBLEM WITH HIS TOP ADVISORS IN FLAG PLOT



SEARCH PATTERNS ARE MARKED ON STATUS BOARDS ON FLAGSHIP



LEFT-HANDED SIGNALMAN MANS SEARCHLIGHT TO SEND MESSAGE



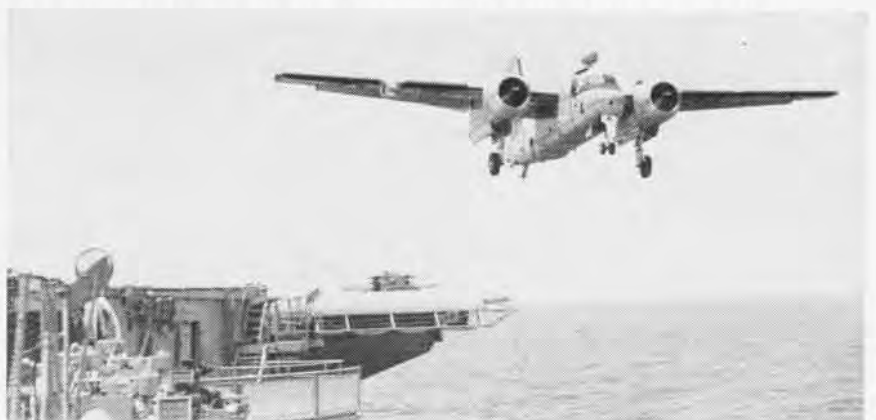
CIC OFFICER CALCULATES NEXT MOVE



RELATIVE POSITIONS OF HUNTER AND HUNTED ARE WORKED OUT IN CIC



ELEVATOR DELIVERS S2F TO FLIGHT DECK



S2F TRACKER IS LAUNCHED. IN CONTACT AREA IT WILL PINPOINT 'ENEMY' SUBMARINE



AS ALFA CARRIER ENTERS SEARCH AREA, HELICOPTERS ARE SENT INTO FRAY WITH DIPPING SONAR





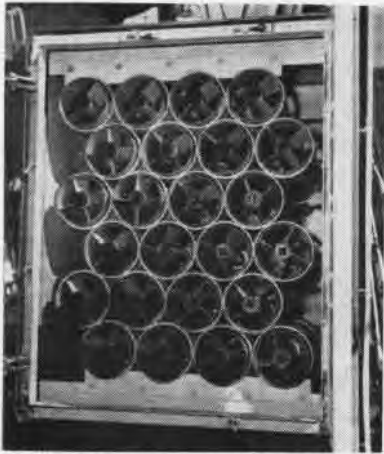
DEADLY CONCENTRATION OF HUNTER-KILLER FORCES CONVERGE ON SUB: DESTROYER, HELICOPTER, AND TWO LOW-FLYING TRACKERS



HSS HELICOPTER LOWERS SONAR EQUIPMENT INTO WATER. COPTER'S ABILITY TO HOVER WITH SEARCH EQUIPMENT IS BOON TO ASW



ONCE THE TARGET IS IDENTIFIED POSITIVELY AS A SUBMARINE, SMOKE BUOYS ARE PLANTED BY SEARCH AIRPLANES AND HELICOPTERS



HEDGEHOGS IN RACK ON DESTROYER



CIRCULAR PATTERN OF HEDGEHOGS DISRUPTS SURFACE OF SEA, SPELLING TROUBLE FOR SUB



ALFA'S TARGET SUBMARINE CUBERA IS FLUSHED FROM HIDING BY SUCCESSFUL ATTACK



HOME FROM FRUITFUL SEARCH AND KILL COMES AN S2F TRACKER



COPTERS ARE RECOVERED AS DESTROYERS FORM COLUMN ASTERN



# NAVAL AIRCRAFT MAINTENANCE PROGRAM

By Maj. Richard A. Bauer, USMC,  
and Lt. Leo L. Hamilton, USN

AIRCRAFT MAINTENANCE is now a complex billion-dollar-a-year business. Compared to the fighters of 1940, the fighters of today are five times as heavy, have six times as many inspection items, 10 times as many switches, 20 times as many valves, 60 times as many electron tubes, require 10 times as many items of support equipment, and cost about 80 times as much.

Many of the items of support equipment require more servicing, training and support than WW II aircraft. Our newest generation of combat aircraft requires an awesome array of support equipment, the average piece costing as much as a brand new 1961 Olds 88 sedan, fully equipped. One piece of maintenance equipment for the A3J costs as much as a squadron of 1940 fighters.

Naval aircraft maintenance has a truly challenging job ahead. And that challenge must be met with

Just so many men,  
Just so much material,  
Just so many facilities,  
And just so much money.

While the problems of maintenance today are large, they are not insoluble. The Naval Aircraft Maintenance Program (NAMP) provides the necessary guidelines for establishing order and efficiency in what is admittedly a complex, expensive and continuing operation. The objective of the program is the one that has always prevailed: *to provide the best possible support for mobile naval air striking power within the limits of what we have to work with.*

Long before the birth of the NAMP, capable people were attacking individual maintenance problems. However, they found that for every problem they solved, two took its place. Real success required action dealing with aircraft maintenance as a total system.

As a result of operator demands for such action, a "task



S2F-3, LATEST ASW aircraft, requires extensive support equipment. Quantity, cost, complexity, and bulk of equipment required to keep

modern weapons systems combat-ready were major considerations which lead to the development of the Naval Aircraft Maintenance Program.

force" in BUAER was set to work in 1956 to hammer out an integrated Naval Aircraft Maintenance Program.

The group started to build from the bedrock of the Navy's mission. By law "the Navy shall be organized, trained, and equipped for prompt and sustained combat incident to operations at sea." Therefore, Naval aircraft maintenance must provide the support required for our air striking power to go anywhere in the world, strike the enemy with fully operational weapons systems, stay to hit him again and again—and be prepared to do it *within the limits of the manpower and economic realities of our time*. Maintenance must provide support essential to maximum mobility, striking power and staying power for Naval and Marine Corps Aviation; in short, *readiness with economy*.

*Readiness* dictates that each combat squadron have all the skills required to sustain that unit in combat.

*Economy* dictates that we cannot afford to assign to each squadron for its exclusive use all the facilities and materials required for its self-support. Even if we could afford to equip each squadron, the material would be so heavy and bulky that mobility would be compromised. *Readiness with economy* dictates joint use of materials and facilities.

Out of these two requirements—that squadrons have within themselves all the skills required to sustain them in combat, and maximum joint utilization of facilities and materials—the basic structure of the NAMP developed. In broadest outline, the program calls for squadron people to perform all direct maintenance required to keep their aircraft mission-ready, while ships and stations provide the required facilities, installed equipment, parts, and other supporting services.

### Developing the Maintenance System

Readiness with economy required that every man and every piece of equipment be placed where they would do the most good. The planners found we were far from this ideal. For example, some activities with only five or six aircraft had fully equipped sets of shops for their own use, while others with 50 or 60 aircraft were sharing shops jointly, and in some cases, working in shops which were not fully equipped. Obviously we did not have the best possible distribution of men and material; the problem was how to improve it.

What would you do if you were a planner, and the boss gave you an order along these lines: "We are commissioning a new unit. Work up the material allowance list, and a personnel allowance. Give them everything they need, but not a man nor a wrench more than that." You would certainly want to ask "What is this unit expected to do, exactly what kind of work, and exactly how much of it?" Improved distribution of manpower, material and facilities hinged upon finding the answer to that question for every naval activity with maintenance responsibilities.

We not only needed to have this information, but we had to have it in a usable form. Thus while it might be theoretically possible to detail every job involved in carrying out the maintenance responsibilities of each squadron, the resulting paper instructions or punch cards would be so ponderous as to overwhelm not only those who were to prepare them but also those who needed to use them.

A basic framework has been developed which makes it possible to set forth the maintenance responsibilities of all



THESE THREE CARTS of Basic Automatic Check-Out Equipment (BACE) for the A3J cost as much as a squadron of 1940 first line fighters.

Naval and Marine activities in one slender volume in terms of maintenance levels. Six were established: Overhaul (Class A), Special (Class B), Component Repair (Class C), Shop (Class D), Hangar (Class E) and Line (Class F). Maintenance tasks have been identified and assigned to one of these levels. Thus, if one knows the number and type of aircraft assigned to a squadron, and the levels of maintenance the squadron is responsible for, it is theoretically possible to determine the skills, equipment, facilities, and material the squadron must have.

Even though the basic framework of the system is simple, gathering and organizing the required information is a tremendous job yet to be completed. The maintenance of each aircraft, missile and piece of support equipment had to be analyzed to identify maintenance functions. The first analysis was only the beginning of a job that will continue as long as there is Naval Aviation. The ultimate goal is not only to identify each maintenance function required but to go on and detail these functions for each major element of a weapons system. This will permit determining skills, manpower, equipment, and parts required to accomplish the jobs.

Mere understanding of the official definitions of the maintenance levels—which average over 300 words—is not enough to enable one to "guess" under which level a given job will fall. For instance, in electronic repair, there is essentially no "C Level"; the majority of repair work is assigned to "D," a fleet squadron function. Readiness requires squadrons to have people skilled in maintenance of this vital and expensive equipment.

The general structure of Naval Aviation maintenance

under the NAMP emerged as follows:

All Navy squadrons are assigned responsibility for Class D, E, and F maintenance on their assigned aircraft. The Airborne Early Warning Barrier Squadron, Pacific, has additional responsibility for performing its own Class C maintenance. The breakdown is somewhat different for the Marines in view of their requirement for operating from tactical, forward area bases.

Marine squadrons have all maintenance support equipment assigned as organizational property. They are dependent upon the Headquarters and Maintenance Squadron (HAMS) and Aircraft Repair Squadrons (MARS) for Class B, C, and D maintenance support. The HAMS and MARS are deployable.

Air stations are assigned responsibility for component repair (Class C) maintenance, the aim of which is to return repairable components to service with a minimum turn-around time. Many items were returned to overhaul when all that was required to ready them for further service was light repair work for which the know-how and parts were available on the stations.

Each air station maintenance department is responsible for D, E, and F maintenance of assigned aircraft and line maintenance of transients. Under the NAMP, the numbers of aircraft maintained by stations was greatly increased through the consolidation of "cats and dogs"—administrative, logistic, and support aircraft. On some stations prior to the consolidation, up to ten organizations controlled from one to five aircraft of exactly the same model. Consolidated maintenance of the "cats and dogs" makes possible more economical use of manpower, facilities and equipment.

### Maintenance Documentation

The Naval Aircraft Maintenance Program is set forth in five "books," one instruction and a notice. No indi-



ENGINE BUILD-UP, now a squadron job, used to be done by the FAS-Rom. The NAMP made many changes in maintenance responsibilities.

vidual, regardless of his qualifications or how long he has worked in maintenance, can expect to understand the program without studying this material. The major documents are *Framework*, *Glossary*, *Facilities*, *Materials*, and *Organization and Procedures Manual*. OpNav Instruction 5400.5A is the basis and authorization for the program.

Individual OpNav notices were addressed to each air station ordering the program into effect on those stations.

The *Framework* document, BUAER Instruction 4700.10 (originally issued as NAVAEROO.101) identifies maintenance functions, classifies them to maintenance levels, and assigns maintenance responsibilities to activities.

Another key document, the *Glossary*, BUAER Inst. 4700.11 (NAVAEROO.111), provides the basis for a common language. For years highly qualified maintenance people had had trouble communicating with each other, the words came through "loud and clear" but the meaning was "garbled." They had the maintenance knowledge, but the terms used in maintenance lacked the precision to carry that knowledge. Many a maintenance "disagreement" has been found to be purely verbal—two sides with the same idea expressed in different words.

The *Glossary* is just a start. As we work with it, we discover situations which require sharpening of certain definitions. New definitions will be added as the need for them becomes apparent.

It is easy to under-estimate the importance of a glossary of terms. Too many people regard it as just so much unnecessary paper-work. However, the sciences illustrate the relationship of clear definitions to progress. Physical sciences which depend upon communication in mathematical symbols have progressed much faster than those which must depend upon less precise language.

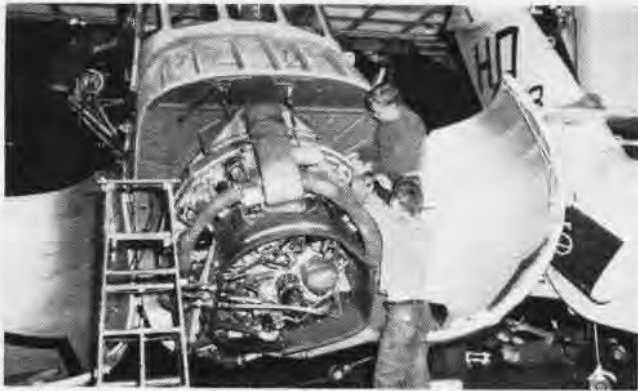
The *Facilities* document, issued as BuAer ONAV-AEROO.121, has been renumbered BUAER Inst 011130.1. The facility plan employs the "modular" concept, recognizing that each aircraft of a given type requires so much Class F line space, so much Class E hangar space, so much Class D shop space, and so much Class C component repair space.

Using the modular concept, the capacity of each air station has been analyzed. On the basis of the numbers and types of aircraft assigned, excesses and shortages were determined and the information tabulated in enclosure (4) of the document.

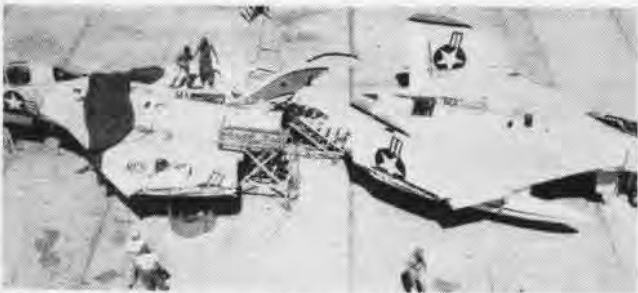
The *Facilities* document is not only a valuable aid in assigning squadrons to stations with the facilities to support them, it is also invaluable for planning station development. For example, plans for the master jet base at Lemoore, Calif., were based entirely on the modular concept.

The *Materials* document, issued as ONAVAEROO.131, is now BUAER Inst 04420.11. The term "materials" includes more than spare parts; it also includes all maintenance support equipment. Allowance lists have been developed for each maintenance activity based on the level of its maintenance responsibility and the number and type of aircraft supported. The *Materials* document contains tabulations of the authorized allowance lists for each station or facility and for its tenant activities.

*Facilities* and *Materials* documents are to be circulated to all the people who "need to know." The documents



**WHAT ARE THE JOBS** that must be done to keep 'em flying? The proper answer was the necessary first step to a basic maintenance framework.



**ON THIS FORMOSA** airstrip, Marines make one "good bird" from two Skyray duds. Mobile air striking power is NAMP's principal aim.



**WITHIN A FRAMEWORK** of organization and procedures standard for all Naval Aviation maintenance, these men repair one of VP-48's P5M's.



**VF-101 MEN** learn FAH fuel system at Miramar. NAMP standardization is a help in training men before they must report to their squadrons.

were issued as Confidential only because of the total compilation of information in some of their enclosures; however, individual sheets of the enclosures are unclassified. Thus, once those portions of the classified enclosures which do not apply to a particular squadron or station are removed, the documents are unclassified and may be circulated freely.

Of the major documents, last but not least is BUAER Inst 5440.2, *Organization and Procedures Manual for Naval Aircraft Maintenance Activities*. This book sets forth standard organizational and administrative procedures for all aircraft maintenance organizations.

### Why Standard Organization and Procedures

Many maintenance people have doubted the value of standardization. Those doubts were not reduced when in some cases they saw efficiency drop as their activity sought to conform to 5440.2. We do not deny that this may have happened. However, we doubt if the temporary dislocations were any worse than those associated with the periodic reorganizations usually associated with a change of maintenance officer or chief. On the whole, the Navy stands only to benefit through Navy and Marine Corps-wide employment of standard—and stable—organization and procedures which have been tested and proven in the field.

While it is hard to find anyone in our time who does not appreciate the value of interchangeable parts in machines, it is not so generally recognized that the same principles also apply in human organizations.

If there is one thing we can be sure of in the Navy, it is personnel rotation. People are going to be coming and going. To have effective maintenance, we must build our organizations in such a way that qualified people can be effective members of the team from the time they report aboard. Standard organization makes this possible. Without standardization, a highly qualified mechanic could be transferred across the ramp to another squadron, operating the identical type of aircraft, and take months to learn an entirely new way of doing things.

Standardization not only permits qualified people to change from one organization to another, it also makes it easier to train maintenance people. In the past, before the adoption of 5440.2, the best we could do was to train supervisors in the technical aspects of their jobs, but leave them to figure out the equally important organizational and procedural parts of the supervisors job through "osmosis" after they reported to the unit.

The *Organization and Procedures Manual* is more than ideas of Bureau people on how the field maintenance job should be done; it is the essence of user experience on the best way. It grew out of recommendations of Navy and Marine Corps operators forwarded through the major air commands. Once these recommendations were boiled down, a pattern emerged. The proposed draft was reviewed by the fleet commanders and published with their approval.

### Improving the Program

As sure as we are that 5440.2 represented the best of the "state of the art" for September 1958, we are equally sure that as a result of field experience since then, it can be vastly improved. In fact, we believe progress and improvement can be made faster in organization, procedures, and the "human" aspects of maintenance than in the

"hardware" of Naval Aviation. But that high rate of progress can be achieved only with the help of everyone in maintenance.

While the Bureau has an indispensable part in the improvement process, the lessons from which improvement must come are being learned where the program is being carried out. In fact, it is probably fair to say that *there isn't a competent and qualified man in maintenance who has worked under the system since its inception, who does not know at least one way in which it can be improved.* The problem is translating those individual lessons learned into improved organization and procedures for all of Naval Aviation.

The only way we can improve the NAMP is to apply it fully in practice and test it out as we would a new weapons system. When we fully understand the directives as they are now written, have tested them in practice, and meas-

right. The NAMP is not yet two years old. The changes it contemplates are at least as great as those involved in decentralizing GE.

The NAMP calls for controlled revolution; the changes it orders are not minor. Nothing can be more wrong than the idea that all it amounts to is removing some signs marked "FASRon XX" and replacing them with other marked "NAS Podunk Aircraft Maintenance Department"—new packages for the same old merchandise.

Under the NAMP, the maintenance responsibilities of most tactical squadrons have been considerably expanded. Tasks, such as engine build-up, formerly performed for them by FASRon, are now squadron responsibilities. While some squadrons are performing all of the functions required of them under the NAMP, others have hardly begun to take up the former FASRon tasks.

The component repair concept is another area of tre-



AT BARBER'S POINT, Barrier squadron electrician picks up electrical parts at retail service.



MICROFILM technical data on P2V is explained by Lockheed Tech Rep, H. F. Salvage.



'READINESS with Economy' dictates joint use of maintenance equipment and facilities.

ured the results obtained, then we can try for improvements. The results obtained with the standard methods will give us something against which to measure experimental results. The "missing link" now is between the man in the field who has tested the program, and the forwarding of that information to BuWEPs where it must come if it is to be reflected in improvement.

Bureau people are sincere when they say, "We are looking for information, advice and experience from Fleet people; those who speak from experience with the program." This stipulation is made because no one can constructively criticize the program unless he has studied the documents and conscientiously tried to apply them. Where this has been done, the critic speaks with the authority of his own experience, and the Bureau is eager to listen.

Perhaps it is premature to think of making vast improvements in the NAMP, when it has yet to be fully implemented in practice. Since changes of the magnitude called for cannot be achieved overnight, even though the NAMP is "law," the living reality of day-to-day maintenance does not yet conform as planned. When General Electric Corporation made a radical change in its customary way of doing business by decentralizing its operations, it was estimated it would take five years to complete the transition. Looking back on it, G. E. President Ralph Cordiner said he thought the original estimate was about

mendous change. Most station aircraft maintenance departments are Class C activities, and as such are responsible for repair of component and maintenance support equipment. Some of these departments are doing well, others not so well. In this area we did not have vast experience to "boil down" into standard organization and procedures. Currently instructions, publications, and procedures governing component repair are being revised and improved to make the job easier to accomplish.

The functions of planning and quality control incorporated in 5440.2 are radical departures from traditional maintenance practice and organization. We have a long way to go before we generally realize the real benefits possible through effective and economical planning and quality control.

The Naval Aircraft Maintenance Program provides a framework for orderly progress, but it *doesn't guarantee progress; it only makes progress possible.* The documents of the Aircraft Maintenance Program are nothing more than pieces of paper with the objective of creating an atmosphere in which improvement can occur. They provide us a course to follow to get where we must go.

The program can be improved, and by measuring operations against the standards of the program, we *can* improve it. But we must have the feedback of experience from the operators, or progress cannot be made.

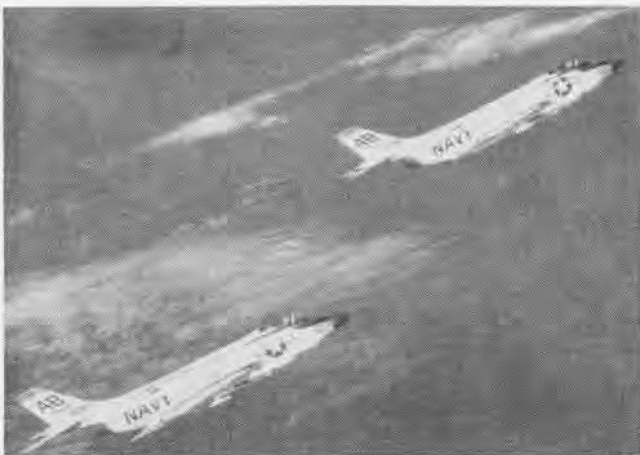


VF-14 FOLIO

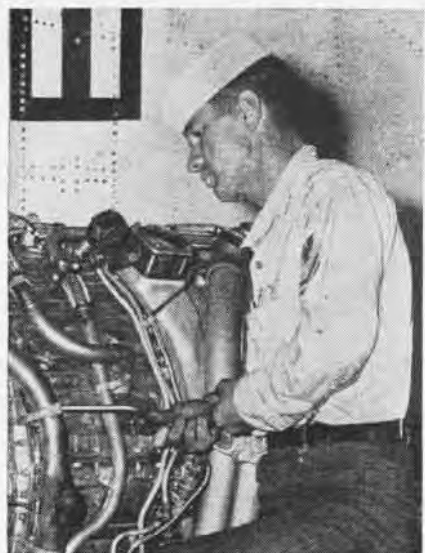
# DEMON DRIVERS IN DEEP SOUTH



Rotating between home tours at Jax and sea duty aboard USS Franklin D. Roosevelt, the Tophatters of Fighter Squadron 14 scored double honors for two years running; bagging the CNO Safety Award and Atlantic Fleet E's. In '59, squadron pilots logged 3348 hours and 1204 carrier landings. In '60, they flew 4384 hours and made 2318 landings. Now led by LCdr. Claude Tully, the F3H squadron has flown MT's, R6L's, F4U's, and F3D's.







# NO MERRIER A CARRIER

## New Jet Engine Announced To Drive Tanks, Pumps and Planes

A new engine weighing only 870 pounds but delivering up to 4050 shaft horsepower has been announced by Pratt & Whitney Aircraft. According to the company, a prototype has completed a 50-hour test and has met all horsepower and specific fuel consumption specifications.

Designated the JFTD-12, the new engine is being promoted for land, sea, and air applications. Two of them will power the Sikorsky S-64 *Skycrane* helicopter. An industrial version, designated the JT-12 and rated at 3000 shaft horsepower, is designed for ship propulsion, compressor and pump power, and for large ground vehicles such as earth moving equipment and tanks.

The new engine series is an outgrowth of the JT-12 pure jet engine which powers North American *Sabreliner* and Lockheed *JetStar* transports.



CHEERFUL CORAL SEA (CVA-43) TO MANATEE: 'THANKS FOR YOUR HOSE-PITALITY'

USS CORAL SEA was deployed in the Far East for the Christmas-New Year holidays, but her crew displayed good cheer. Examples:

Destroyers coming alongside to refuel at sea got the regular brass band treatment they might have expected from any capital ship. In addition, they saw *Coral Sea* crewmen display a sign reading, "Tis the *Coral Season* to be jolly." And a moment later, a further sign, "Let's get Gassed."

When receiving instead of dispensing fuel, *Coral Sea* had another sign for the fleet tanker *Manatee*, appropriate to the operation, "Thanks for your HOSE-pitality."

Soon afterward, when again she transferred some of the same fuel to one of her escorts, the sign bearers were ready with, "You ought to feel spoiled—you're *Coral Sea* oiled."

*Coral Sea* was dispatched to the Orient in September to bolster United States forces there. She is commanded by Capt. John J. Lynch and flies the flag of RAdm. Alexander S. Heyward, Jr., Commander Carrier Division Five.

The ship and her 3600-man crew spent Christmas in Sasebo, Japan. But in the weeks preceding the holiday, the spirit was still displayed.

Cakes and cookies prepared in *Coral Sea's* bakeries were high-lined to other ships of the Seventh Fleet in containers cut in the shape of giant stockings.

## ASO Urges Handling Care Valuable Items Broken by Neglect

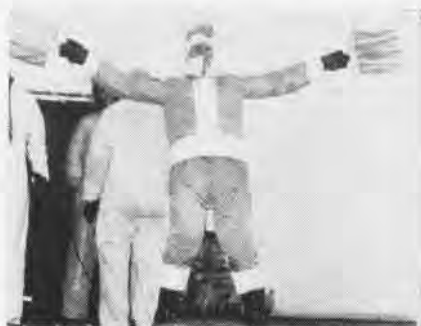
Greater care on the part of Navy-men who package and handle high value items is urged by the Aviation Supply Office.

Examples of recent and costly mistakes are cited:

A crate of starter-generators was damaged beyond repair because the man who prepared them for shipment failed to secure the generators on a shipping cradle which had been specially designed for them.

Sensitive radar test sets have had to be sent back for calibration because of broken knobs and flanges owing to the fact that the sets were not packaged properly in the first place. The people along the line failed to pay heed to "This Side Up" markers.

Helicopter transmission parts and rotor heads have been damaged severely because, again, they were not secured properly in shipping containers that had been designed for them.



'T WAS THE DAY before Christmas, and many creatures assigned to VS-24 were stirring above USS *Valley Forge*. Suddenly there appeared to their startled eyes, old Santa himself, none other than Lt. R.M. Johnson.

## Every Six but 'Deep Six' Saratoga Parlays 6's to Successes

Through accident, intent, or coincidence, the USS *Saratoga* seems mated to what mathematicians call a "perfect number."

What is *Sara's* perfect number? Six, of course.

CVA Sixty is the Sixth U.S. Navy vessel to bear the name *Saratoga*. She spent the latter part of her sixth year in commission (1960) with the Sixth Fleet on a Six-month cruise in the Mediterranean (see center spread of the January issue of *NANEWS*).

Flying the flag of Commander Carrier Division Six, she entered her Sixth port of the cruise, Livorno, Italy.

# VX-6 R7V BAGS BUGS IN FLIGHT

**T**INY BUGS and insects which drift about in the atmosphere between New Zealand and Antarctica are being scooped up by a specially-rigged R7V *Super Constellation* of VX-6.

A complicated trap for the R7V was designed by Lockheed and installed at Christchurch. Aboard the plane for its first Antarctic flight after the scoop was installed was Josef Sedlacek, an entomologist from the Bernice Bishop Museum in Hawaii. He is in charge of the project.

In flight, he adjusted valves and airtight locks which permitted periodic changing of filters without affecting the plane's cabin pressure.

The scoop is attached to one of the plane's windows. The intake passes through a special arrangement which slows the stream of air from 250 to 30 knots.

Airborne organisms, including insects and other particles, are strained and the filtered air is exhausted through another window.

Interior parts of the trap are arranged on the starboard side of the plane's passenger cabin. The whole package measures some 16 feet and is shaped like a giant cigar.

Specimens are collected at the end of a flight and preserved in alcohol for forwarding to the Bishop Museum for further study.

The aerial plankton collection program is part of an air-land-sea program inaugurated during previous *Deep Freeze* operations. It is supported



R7V SUPER CONSTELLATION OF VX-6 ON ICE STRIP AT MCMURDO SOUND, ANTARCTICA

by a grant from the National Science Foundation.

According to a description of the project published by the U.S. Antarctic Research Program, trapping of insects and organisms by aircraft will reveal the measure of height and in what air currents they are carried.

Results of the study may provide helpful data for botanists, agriculturists, microbiologists, meteorologists, and even quarantine experts.

The flight of the R7V is only part of the Navy's air support of entomological projects. Last season a special apparatus was installed in a UC-1 *Otter* to assist in the program. Nets were attached to frames extending from the opened hatches of the plane.

At least three times a week, weather permitting, "bug runs" were made.

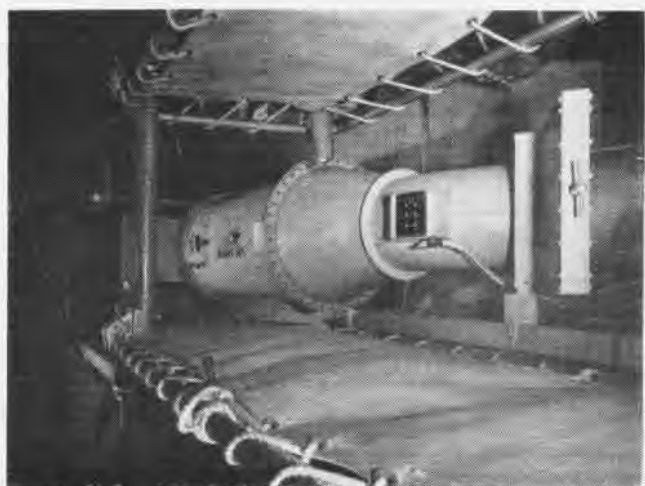
Though none were obtained during the *Otter* flights, that same season entomologists collected ten species of mites in Antarctica, six of collembola (springtails), one of anoplura (louse), seven of mallophaga (lice), and one fly—in a continent once thought devoid of insect life.

Most of the collecting by the R7V is being done on Christchurch-to-McMurdo turn-around flights in which passengers and cargo are flown.

The collecting program will continue during flights to the United States, filling a gap in the Pacific Ocean Study conducted by the Bishop Museum during the past several years.



'BUG CATCHER' INTAKE PROTRUDES FROM FUSELAGE OF THE R7V



BULBOUS CENTER OF PLANKTON SCOOP SLOWS SPEED OF AIRFLOW



LCDR. THOMAS R. CARR, a member of the weather analysis team at Pt. Mugu, carefully checks photograph sequences obtained by *Tiros II*.



NAVY METEOROLOGIST, Ltjg. Richmond Garrett, compares a *Tiros II* neph analysis with a recently drawn weather chart to verify forecast.

# WEATHER PLOTTED FROM SPACE

SEVERAL HUNDRED miles off California, a meteorologist aboard an attack carrier stares quizzically at an uncompleted weather chart. A ship, 300 miles west of Eureka, reports a 25-knot northwesterly wind and a 53° temperatures.

Obviously, a cold front runs north and south between them, but there is no indication of the type of weather in the void between reports. Right in the middle of this big hunk of nothing is a circle marked "1000 PIM" (Point of Intended Movement).

The meteorologist shrugs and draws a long blue line down the chart between the ship reports. Twelve hours later, the cold front will be 120 miles further east, right on top of PIM. He finishes the map and heads for flag plot.

Minutes later, he winds up his briefing: "So, Admiral, the front is weakening and there will only be broken cloudiness with good visibility and ceilings for tomorrow morning's operation."

The meteorologist hopes he is right, but he knows, at best, he's made only an educated guess.

But this is the way they did it in the "old" Navy. Let's back up to the place where the meteorologist drew the blue line.

Suppose he had a series of pictures taken from 400 miles in space looking down on the cold front right where

By J. D. Tikalsky, JOCS

it will cross PIM. These pictures show the progress of the front and its changing characteristics. No guess work here! When the meteorologist leaves flag plot, he doesn't cross his fingers, and the OCE doesn't take one last look at that big empty space on the weather chart before he signs his night orders.

This type of foolproof forecasting is the ultimate aim of the National Aeronautics and Space Administration's weather satellite program. It may be a little while until space vehicles can be used for actual forecasting, but the Navy currently is helping NASA and the U.S. Weather Bureau test the operational value of cloud photographs taken from space.

As *Tiros II* circles overhead and broadcasts its televised pictures earthward, a chain of events begins at the Naval Missile Center, Point Mugu, Calif., which puts these photographs to experimental operational use by the Pacific Fleet.

On San Nicolas Island, a PMR instrumentation site, 60 miles southwest of Point Mugu, a giant 60-foot parabolic antenna commands the orbiting satellite to transmit, then receives its video signals.

The signals are re-transmitted to a read-out van near the PMR weather

center at Point Mugu where they appear as a televised picture on a video scope.

The screen is photographed at 30-second intervals, and minutes later, a strip of 35mm. transparencies is delivered to the weather center.

Members of the weather analysis team, composed of Weather Bureau, Navy and Air Force personnel, check the photographs. Pictures taken by *Tiros II* are distorted, depending upon the tilt of the wide-angle camera lens in relation to the surface. The pictures must be identified and rectified. Then images of selected pictures are projected onto a grid chart, and the cloud cover is outlined on a special map. This is called a "neph analysis," neph being derived from the Greek word for cloud, *nephos*.

The neph analysis, transmitted via facsimile telephoto to the Fleet Weather Central, Alameda, Calif., is re-broadcast to the Pacific Fleet.

Lloyd Tourville, Weather Bureau meteorologist in charge of the Point Mugu analysis team, says that their goal is a maximum of two hours lapsed time between receipt of the satellite signals and telephoto broadcast to the Pacific Fleet.

● Two helicopters from the USS *Hancock* responded to a call for help from Tarama Jima, a small island of the Ryukuan chain, and successfully evacuated two badly injured men.

## Whiting Triple-Threat Man Active in Navy, School and Church

Wilfred V. DeGrasse, YN1, in VT-3's Administration Office at NAAS WHITING FIELD is an unusual combination—daytime sailor, nighttime scholar, and Sunday preacher.

He can be easily located during his daily 24-hour cycle. From 0800 to 1600, he can be found at his desk in the administration office maintaining the records of VT-3's 106 officers.



IN HIS LIFE, NO MOMENTS ARE WASTED

From 1800 to 2200, he is sitting in class at the George Washington Junior College in Pensacola, Fla., where he carries a full schedule four nights a week.

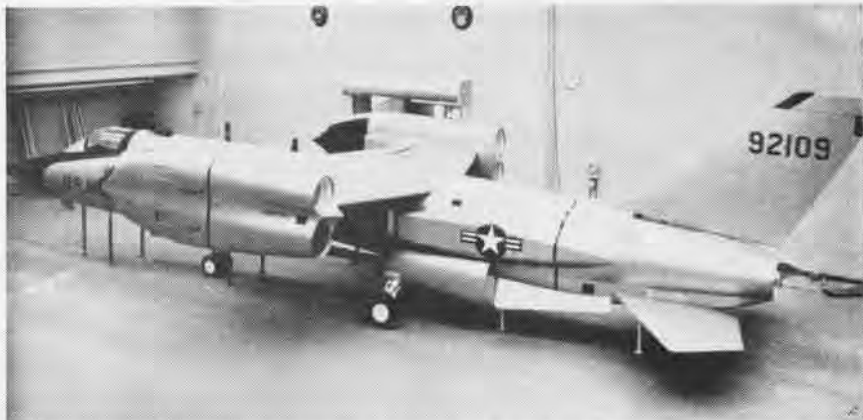
On any Sunday he can be found preaching the Gospel in one of several churches within a 50-mile radius of Milton, Fla. His inspirational messages are dignified, sound and helpful. He preaches to all denominations and accepts no money for his time and service, Whiting reports.

Between these set hours, he is keeping up with his heavy college curriculum, grabbing a meal on the run or collapsing in bed for a few precious hours of sleep.

DeGrasse is packing as much college education as he can into as short a time as possible. He is carrying courses in biological science, business math, communications, history, algebra and physical education. Out of 12 grades in the past year, he has received 11 A's and only one B. His goal is a Bachelor's degree in English while he is stationed with the Training Command.

The head of his college describes DeGrasse as an A caliber student.

According to his boss, LCdr. J. Crocker, Administrative Officer of VT-3, he "works early and late every day. I've never heard him mention fatigue or complain of being tired."



A FULL-SCALE MODEL of a supersonic jet fighter-bomber, able to take off or land vertically and operate under combat conditions from small, easily concealed fields, has been developed by Bell Aerosystems Company under a joint contract with the U.S. Navy and Air Force. The single-place D188A is powered by four J85 turbojets, mounted in the wing tips, which rotate to vertical position for take-off and landing; and four J85 turbojets located in the fuselage, two at the rear and two forward. Bell engineers predict that the D188A will exceed Mach two in flight.



NAVAL PILOTS DISPLAY SUDAN SOUVENIRS

## Naples Aviators to Africa Ferry Medical Supplies to Sudan

A group of NAF NAPLES Naval Aviators, headed by NAF Executive Officer, Cdr. J. H. Gullett (left in photo), recently acquired souvenirs on an unusual mission to the heart of Africa.

In response to a request from the Republic of Sudan, two crews and an R4D from the Naval Air Facility were ordered to fly doctors, scientists, and medical equipment and supplies from Cairo, Egypt, to Malakal, Upper Nile Province. Three round trips were made.

The medical team from the United States Naval Medical Research Unit No. 3 was headed by Dr. Donald Heyneman who went to Malakal in March 1960, preparatory to establishing the laboratory.

The unit was fighting the spread of dread Kala-Azar, a variety of sleeping sickness. The unit hopes to make real progress in the very near future.

## Instructors are Indoctrinated 1000 Inverted Spins for FIIG

FIIG instructor Lt. J. L. Akagi recently performed that unit's 1000th inverted spin. Flight Instructor Indoctrination Group (FIIG) at NAS PENSACOLA is the only unit in the Navy



CAPT. DE LONG, NAS C.O., GREETS AKAGI

which engages in these deliberate maneuvers.

New instructors are given the inverted spin to prepare them to cope with situations which student pilots may accidentally put them into.

Inverted spins are demonstrated with the T-34 Mentor, the only active Navy aircraft cleared for the spin.

● USS Hancock's CVG-11 participated in Philippine Aviation Week by putting on an air show at the Manila International Airport. Members of the Philippine press corps had visited CVA-19 earlier for a full preview.



**RESCUE PLEA** is answered as Lt. J.N. Mangin (left), aided by C. R. Arras, AD3, and local citizens help Proceao Hernandez aboard UF-1 Albatross. Hernandez and another Filipino were bleeding internally, requiring airlift.

### Satellite Rotation Slowed Magnetic Rods De-Spin Transit

Navy scientists have succeeded in virtually stopping the rotation of two satellites orbiting in space. The earth's magnetic field was used as a brake to de-spin both *Transit I-B* and *II-A*, navigational satellites.

The satellites had to be spun on launching to stabilize their flight. However the ultra-high stability radio transmission requirements for *Transit* made it necessary to slow the spin to less than one revolution per 100 seconds.

The spin was slowed with the use of small magnetic rods which were magnetized one way then the other.

### Grumman Hosts S2F Group VS-24 Tours Long Island Factory

Grumman Aircraft Corporation arranged an open house for personnel of VS-24 at its Bethpage Long Island plant. The squadron which flies the Grumman S2F *Tracker*, was in the New York area for the week-end aboard USS *Valley Forge* (CVS-45).

The closely scheduled tour lasted most of one day. The morning was devoted to briefings and discussions of future antisubmarine projects with Grumman engineers. Later, officers and men toured various units of the Bethpage plant. They observed production of the S2F-3, latest in the *Tracker* series, the W2F, A2F, and UF.



**THE FIRST** Ryan Q-2C Firebee jet target missile was turned over to Capt. R.L. Savage, BuWeps Representative in San Diego, by E.G. Uhl, Ryan Vice President, Technical Administration. It is first of 100 for the Navy.

### Let There Be Amusement! Tenpins to Invade Antarctic Ice

Shades of Shackleton! And Palmer, Scott, Byrd and Ellsworth! They're building a bowling alley in the Antarctic.

That's what the release says, anyway. A four-lane bowling alley is being equipped by the American Machine and Foundry Company. Navy Seabees from Davisville already are being trained at the nearby AMF CRANSTON, R.I., plant to put together and maintain the alley in Antarctica.

Specific location of the alley has not yet been determined, according to the release, but it is to become a morale builder for 138 Navymen and scientists who will winter over in *Deep Freeze 61*. Size of the camp population would indicate it is to be installed at the Naval Air Facility at McMurdo Sound.

The release concludes: At this point there is one thing the operators of the new bowling center are sure of. It won't be air-conditioned in the summer. And the penguins probably will be happy if they don't have to fill in should the Navymen and the scientists run short of pins.



**BROTHERS** flew together at Kingsville when Midshipman Robert E. Calvert (R) made familiarization hop with his brother, Ltjg. John F., in an F9F-8T Cougar of VT-22. Younger brother is student at Northwestern University.



**THIS SIGN** is a familiar landmark to hundreds of helicopter pilots who have received their training at Ellyson Field, named for Naval Aviator Number One. HT-8, the training unit at ALF Ellyson, trains all Navy, Marine Corps, and Coast Guard helicopter pilots. Winner of the CNO Aviation Safety Award for 1960, the squadron has logged but two mishaps in its last 40,000 hours and has flown more than 138,000 hours since its last helicopter fatality occurred.

### Language Barrier Broken Combined NATO Crew Repairs P2V

The problem started when a Patrol Squadron Five P2V piloted by Lt. W.H. Saunders developed engine trouble and landed at the NATO base at Decimomannu, Sardinia.

As the tedious repair job began, C.E. McClure, AD1, plane captain of the *Neptune*, was deluged with offers of help from Italians, Germans, and Canadians. In spite of the language problem, the "allied" crew completed the repair in near record time.

# NMC MEETS CLEANLINESS STANDARDS

SEVERAL PRECEDENTS were set when a *Samos* reconnaissance satellite was launched from the Navy Missile Center at Point Arguello, Calif.

This was the first launching of the *Samos* vehicle; the first launching from Complex #1; first satellite to be launched from Point Arguello; first heavy satellite pad to be constructed by the Navy; and this was the first pad that achieved a non-contamination rate in its propellant loading system.

The latter of these, propellant loading system, more commonly called PLS, consists of hundreds of pipes, valves, and lines. The PLS, located externally to the missile itself, controls the flow rate of liquids and gases that enter the missile's fuel tanks. If a particle the size of a pinpoint, a tiny hydrocarbon, or even human oil emitted from the palm of a person's hand enters the fuel system at launch time, the missile could blow up on the pad or destroy itself seconds after it is airborne.

Specifications for the Pt. Arguello launching complex stated that if 72 parts per million were found, of a 150-micron size, the PLS should be considered contaminated. The point of a sharp pencil is equivalent to 150 microns. Most experts said this in itself was most difficult to achieve. However, a group of Naval Civil Engineers attached to the Office of the Resident OinC of Construction thought differently.

Before turning the pad over to the Air Force, a complete inspection of the propellant loading system was made. Smith Emory Laboratory analyzed filter pads used in this inspection and stated that complex #1 had only two or three particles per million and the micron sizes were, in most instances, under 100. This far exceeded the PLS specifications. No particles greater than 150 microns in size were found.

Installation of a clean PLS is a long and laborious job. It is a *must* in the missile business. All pipes, valves, line, and fuel tanks must be inspected as they arrive.

The first inspection is the "wipe test." This consists of wiping the inner surface of each line or pipe that



PLS INCLUDES LOX TANK, GASEOUS OXYGEN BOTTLES, PIPES, VALVES HOUSED IN BOXES

is exposed to liquid or gas with a piece of clean filter paper. After wiping, the paper is checked for size in microns. If the equipment passes this test, it is then checked for hydrocarbons by the "black light test." If any area shows up fluorescent, hydrocarbon is present and the item has to be returned for cleaning.

Articles found to be contaminated are sent to a cleaning facility. In this room, care must be taken to prevent unnecessary contamination of items undergoing cleaning processes. All air must be filtered to the point where any particles entering the room are below the size which could be tolerated after cleaning. Plastic gloves and caps are worn by personnel in this room. After the articles are cleaned, they are again inspected by the "wipe test" and "black light test." If satisfactory, a gaseous nitrogen pressure—called positive purge—is put on the pipe or line. The article is then carefully sealed, tagged, and returned to the launch site.

During pipe installation, a positive pressure must be maintained at all times to make sure the articles remain clean. After all parts have been installed in the PLS, a pressure test is conducted to insure against leakage and further contamination. This is done by pumping liquid nitrogen by a recharger and converting it into

gaseous nitrogen through pipe lines and into gaseous storage bottles. Test pressure is held for five minutes and reduced to operation pressure. These pipe lines then are checked for leakage. If okay, the pipe lines then are checked for contamination by blowing a recorded volume of nitrogen through each line.

A special section of pipe is made to hold the test pads, or filter pads, at the end of each pipe line being tested. These filter pads are backed up with a 100-mesh screen which in turn is backed up with a heavier screen. After gas is blown through the filter pads, the pads are carefully removed and placed in a sealed polyethylene envelope and sent to a laboratory for contamination report. If the filter pad passes this inspection, the PLS is declared clean.

Mr. H. J. Train, Civil Engineer Corps inspector for the propellant loading system on Launch Complex No. 1 at Point Arguello, said:

"We realize the criteria we demanded was a real test of engineering. It called for a lot of tedious work on the part of numerous people. Those of us who worked on the pad feel that the Arguello PLS is the cleanest in the country." He added further, "Who knows, maybe our inspection efforts will lead to greater efficiency in America's missile and satellite program."

# TELESCOPE LAUNCH TEST AHEAD

**S**TRATOSCOPE II, an attempt to photograph planets and stellar nebulae with clarity never before possible, is entering the preliminary testing stage, according to a joint announcement made by the Navy, the National Science Foundation, and Princeton.

Heart of the project is a balloon-borne 36-inch telescope which will be lofted to 80,000 feet (more than 15 miles), where it will be above nearly all of the atmospheric turbulence and dust that distorts or obscures ground-based observations. This permits photographs to be made with a resolution greater than from the ground by a factor of three to five.

The project is under the direction of Prof. Martin Schwarzschild, internationally noted astronomer at Princeton University, who also directed the highly successful flights of a 12-inch solar telescope, *Stratoscope I*, in 1957 and 1959. The new program is sponsored by the Office of Naval Research and the National Science Foundation, with additional support from the National Aeronautics and Space Administration.

Princeton has awarded a contract to a private research organization, Vitro Laboratories, Silver Spring, Md., to serve as program manager for Prof. Schwarzschild. Vitro's role is to super-

vised the development of the balloon system, evolve launching and recovery techniques, and plan and conduct the launches.

The balloon will remain aloft throughout the night while observations are being made. Among the first objectives of the Princeton astronomers are:

1. Analysis of the divisions in Saturn's rings, possibly throwing more light on the factors that determine the orbits of the many particles that make up the rings.

2. Studies of the sudden atmospheric changes that take place on Jupiter, which may help to explain Jupiter's mysterious Red Spot, and on Venus, and of the possible relationships they may have to solar magnetic storms.

3. Close examination of the gaseous nebulae between stars (from which new stars are formed), providing possible clues to the way our own sun was formed.

4. If conditions are right, the possibility of achieving man's first look at the surface of cloud-shrouded Venus through brief holes in the cloud cover.

A proposed balloon system to lift the telescope payload, which weighs about 4300 pounds including associated electronic equipment, is under de-

velopment by the G.T. Schjeldahl Co., Northfield, Minn. The balloon will use a new material developed by Schjeldahl for ONR. Known as S-10, the material is basically Mylar plastic reinforced with dacron mesh and is lighter and stronger than polyethylene. A method of utilizing a helicopter to capture the balloon and its payload as it descends, in order to achieve a soft landing, is also under development.

An initial test of a helicopter-towed device for snagging the balloon has been completed by the Naval Air Development Test Unit, South Weymouth, Mass. The first test launch of the new system with a dummy payload and also of the helicopter retrieval method is scheduled early this year. Target period for the first fullscale launch with the telescope is fall, 1961.

## Norfolk Hosts Air Orphans Soap, Razor, Clothes Provided

Plight of the air orphan has been eased, thanks to a new service of NAS NORFOLK. The "orphans" are those unfortunate aviators and aircrewmembers who are forced by fate into an unexpected overnight stay for which they have neither inclinations, clothes, funds, or other essentials. No longer will they spend miserable hours in a "seasoned" flight suit.

Capt. Max A. Piper, Air Station Executive Officer, is credited with bringing to Norfolk the idea of establishing "overnight kits" in the BOQ and transient barracks for the reluctant visitors.

The kits provide toilet articles, uniforms in various sizes, and civilian clothes. They even thought of that most essential liberty item: money. A "slush fund" has been established from which the orphans may borrow.

## All-Weather Unit Active VF-101 Flies 1015 Hours in Month

In a month interrupted twice by holidays, the *Grim Reapers* of VF-101 flew 1015 hours in F3H *Demons*, F4D *Skyrays* and F9F-8T *Cougars*.

The Replacement Air Group squadron supported two carrier qualification detachments aboard the *Forrestal* during the month.

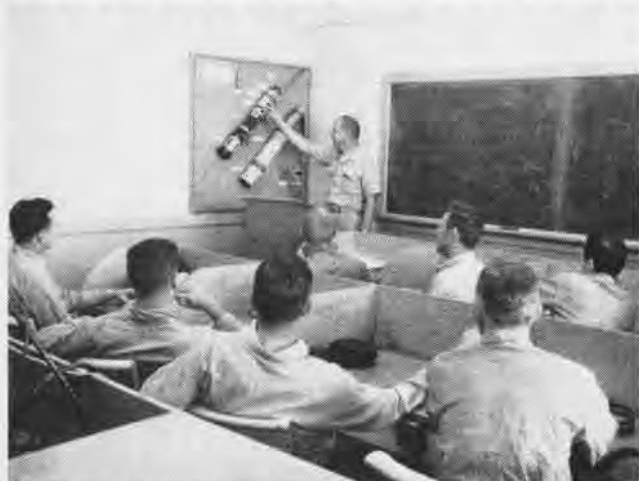
Based at NAS KEY WEST, VF-101 is commanded by Capt. L. R. Hardy, Jr. Its mission is to train all-weather fighter pilots for the Atlantic Fleet.



**FIRST CLASS** of helicopter replacement pilots to complete training with Helicopter Antisubmarine Squadron Ten, NAAS Ream Field, has been graduated. Shown above are the six graduates, the Commander Carrier Antisubmarine Air Group 51 and the HS-10 skipper: (left to right) Ens. M. R. Butte; Ltjg. M. A. Fox; Ltjg. J. F. Sickman; Cdr. L. W. Metzger (CASG-51); Cdr. L. G. Wade, C.O. of HS-10; Ens. R. L. Harnden; Ens. L. M. Prulbiere; and Ens. T. A. Riechie.



# SUBMARINE HUNTERS OF THE MIDWEST



**INTRICATE WORKINGS** of a sonobuoy are explained in a Minneapolis classroom to Weekend Warriors before they begin submarine search.



**RADAR TRAINER** is used to send signals to training scopes so the hunters can learn to detect subs and keep track of their position.

**N**AVY AIR RESERVISTS based at NAS MINNEAPOLIS are learning to hunt submarines—in the Upper Midwest.

The part-time sailors work with NAS personnel in classrooms and aircraft as they master the fine art of operating sonobuoys and magnetic anomaly equipment.

Before taking to the air they have lectures on the gear and sub-hunting techniques. Then, airborne, they prowl.

A mobile ground transmitter is deployed somewhere in a search area to simulate submarine sounds. Air crews pick up and track these signals as if they came from a sub.

The sonobuoy is an electronic apparatus which is dropped from an airplane to the surface of the ocean. It picks up the sound of nearby submarines and sends a signal back to the aircraft. Reservists are taught how to drop sonobuoys into the sea in a specific pattern. They learn how to tell the difference between a sound made by a whale and one made by a submarine, and how to track the latter. MAD equipment permits them to determine whether target is metallic.



**SONOBUOYS** are loaded into the belly of a P2V Neptune by ground crewmen before the VP-812 plane takes off to hunt elusive subs.



**RESERVE-MANNED** P2V-5F flies over Mississippi River and Minneapolis while returning to Wold Chamberlain airport after a simulated sub hunt. Elongated tail section houses the MAD gear.



**PLEXIGLAS** nose of P2V houses a lookout who adds Mk. 1 eyeball to electronic search gear.

# LETTERS

SIRS:

An interesting sequel to your September item (p 17) about the Navy FJ-3 that crashed off of Maui, Hawaii, is the continued assistance rendered the subject flight section. Three FJ's, who were with the one that crashed, remained on scene as long as possible and then landed at the Maui airport.

Unfortunately, the airport had no fuel suitable for refueling these jets. At the request of the Navy, an SC130B *Hercules*, piloted by LCdr. P.W. Tift, Jr., departed the Coast Guard Air Detachment, Barber's Point, to assist. On board was an external power cart and extra fuel hose.

By using the SC130B's defueling capability, JP-5 was taken from the aircraft's tanks and pumped directly into the FJ's. Enough fuel was transferred to enable each FJ to return to Barber's Point with an ample reserve. The service fuel load of nearly 7000 gallons enabled the SC130B to fuel the FJ's and still have more than enough to return to Barber's Point.

The operation was most successful. Besides assisting our fellow pilots across the field, we were able to exercise another of the many capabilities of this versatile aircraft, the SC130B.

JOHN D. McCUBBIN, USCG  
Barber's Point, Hawaii

SIRS:

... refer to grossly misrepresented caption Page 30 December issue.

Position referred to as air ops is actually Flight Deck Control.

As ex-Aircraft Handling Officer I strongly object.

All Fleet Aircraft Handling Officers have probably fallen on respective swords; a tragic loss.

Discovered error at 31,000 feet over Albuquerque.

Sounds like publicity plot of Frustrated Air Ops Officer aided and abetted by Editor, NavAirNews.

CDR. L.E. KIRK, JR.

'Tweren't neither! Junior caption scribbler went way back for this one, is now short some Brownie points—so are some proof readers.

SIRS:

The January 50th Anniversary issue of NANews contained excerpts from Lt. B. H. Wyatt's log for his 1922 transcontinental round trip. The enclosed photo shows a DH-4B bearing the markings, "Aircraft Squadrons Battle Fleet, San Diego, Calif., to Washington, D.C." The caption lists the pilot as Lt. Wyatt and the date as December 1923. Lt. Wyatt's log excerpts of October 22 would indicate that the destination was not definitely established as D.C. until the 1922 flight reached Pensacola.

This seems to conflict with the markings shown in the photo. Perhaps some of your readers could indicate whether this photo



actually is of the 1922 flight; or, if another flight was made a year later; or, possibly, if the markings were applied when it was decided to continue on to Washington in 1922 and then not removed from the aircraft until after this picture was taken.

F.J. O'BRIENSKI  
BuWEPs

How about it, readers? The experts hereabouts couldn't help us on this one.

SIRS:

In reference to the article, "FAI Fixes Space Rules," on page 37 of the January issue of NANews, we would like to call your attention to the second paragraph which states, "prior to the record attempt." This should read "After the record attempt."

In order to establish any official World or World-Class Record, whether it be with rockets, airplanes or balloons, it is not necessary to notify FAI, Paris, before an attempt is made. Within 48 hours after the completion of a record attempt, FAI must be notified by cable and within a certain specified number of months, the completed file supporting the record must be forwarded.

H. E. "TONY" MAHLMAN,  
Secretary, Contest Board  
National Aeronautic Association

## CREDITS

The January 1961 center spread picture of three Sixth Fleet carriers was taken by Rolland H. Nelson, PH2, shooting from a TF *Trader* with the door removed.

The A3J photo on page 7 was taken by Jerome Teplitz, engineer in the Bureau of Naval Weapons. The JR-3 on page 9 is by courtesy of Mr. Peter M. Bowers of Seattle.

## Jax O&R Crew to Europe Aids Navy with Corrosion Control

A special four-man team from the Overhaul and Repair Department of NAS JACKSONVILLE recently returned from a 15-day mission to various naval activities in Europe.

The four experts were dispatched to Europe when the Bureau of Naval Weapons requested that Jacksonville provide personnel experienced in aircraft corrosion control.

The crew gave instruction, inspected aircraft, and provided briefings on corrosion prevention and control in Germany, Italy, and at other points.



TEN GENTLEMEN from San Diego are shown at their request to point up the coming Fifth Annual Reunion of the Tailbook Association to be held 11 February at Stardust Hotel, Mission Valley, San Diego. The association is composed of carrier type pilots who specialize in sea stories and meet annually to swap same. Top Tailbooker is Capt. Phillips, MC, USN, 2nd from port.

(Continued from back cover)

Our naval aircraft are fitted with air-to-air missiles. If one of these aircraft is flown over enemy territory seeking engagement with the enemy to shoot down enemy planes, it is certainly being used offensively and could well be called an offensive missile system. If this same aircraft were used in the United States to shoot down enemy aircraft attacking the United States, it could be labeled a defensive weapons system.

If the aircraft were used at sea with a task force and was attacking an enemy territory to destroy enemy war capabilities, it would be an offensive weapons system. If the same aircraft were used at sea in the same spot, to defend itself from an attack by an enemy aircraft, it could be considered a defensive weapons system. However, since the whole task force was put in position in order to attack the enemy, the operation as a whole would be offensive. The question of whether the aircraft is purely a defensive or purely an offensive weapons system cannot be categorically determined . . . .

The difficulty in distinguishing between offensive and defensive weapons systems is not restricted just to the Navy. A rifle in the hands of a marine is offensive or defensive depending upon the use, not to which the rifle is put, but the use to which the marine is put.

We in the Navy must take every opportunity to correct any impression that it is possible to divide Naval forces weapons systems into either an offensive or defensive category. If we fail in this, we shall have allowed others to lose sight of the flexibility that is inherent in our naval forces. This flexibility permits a discriminating and sensible choice in how we do those jobs for which the Navy is responsible.

Without performing acts of aggression in peace or infringing on the sovereign rights of other peace-loving nations, the Navy stands ready, far from the shores of the United States, to strike at the sources of overseas threats to our national security, if need be, but fundamentally to preserve the peace. The offensive capabilities that are inherent to our combatant ships and aircraft and to their weapons systems establish the Navy's key contribution to the important responsibility we are privileged to share with our sister services—the defense of the United States against all foreign aggression. The Navy's offensive approach to this defensive responsibility remains as it was so ably expressed by John Paul Jones in 1778—"I wish to have no connection with any ship that does not sail fast, for I intend to go in harm's way."

NAVAL AVIATION

**NEWS**

# THE BEST DEFENSE

From time to time we in the Navy hear our ships and aircraft, and their weapons systems, referred to as "defensive" forces. We hear this from members of the other services and civilians alike. Although such a connotation may have stemmed from the age-old reference to the Navy as the nation's first line-of-defense, it clearly evidences a misunderstanding that exists outside the Navy regarding the offensive nature of most naval combat operations and the role of our ships, aircraft, and their weapons systems. All of us in the Navy share an important responsibility of being able to speak intelligently and sincerely about what others may call our "defensive" forces but which are, in fact, "offensive" forces.

In war, the Navy does not wait for an enemy to come to our shores. We seek him out in his homeland or wherever he may choose to hide: on, in, or near the seas. In peace, the Navy deploys its ready forces toward the frontiers of our potential enemies or in other distant areas chosen to thwart those nations who, by their own intentions or at the suggestion of others, would disturb the peace of the world.

True, the Navy by its actions defends the United States as do our sister services but, in war, it is the **offensive** operations by our fleets that project the power and determination of the American people into the homeland of our enemies.

With regard to the weapons systems with which our ships and aircraft are armed, there are very few which can be categorized as only offensive or defensive. Whether they are offensive or defensive depends upon what we do with the weapons systems and what the enemy does in countering the weapons systems. For example, if any weapons system in the Navy could be classified as defensive, most people would classify mines as a defensive weapons system. Mines laid in our harbors to prevent enemy ships from entering those harbors constitute a defensive weapons system. Those same mines laid in an enemy harbor to destroy enemy ships as they depart from their own harbor are just about as offensive as it is possible to get.

(Continued on inside back cover)