

NAVAL AVIATION

# NEWS



**MARCH 1971**

NavAir No. 00-75R-3

# NAVAL AVIATION NEWS

FIFTY-SECOND YEAR OF PUBLICATION

Vice Admiral Thomas F. Connolly  
Deputy Chief of Naval Operations (Air)

Rear Admiral Malcolm W. Cagle  
Assistant Deputy Chief of Naval Operations (Air)

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## THE STAFF

Commander Ted Wilbur Head, Aviation Periodicals  
and History

LCdr. Paul Mullane Editor

Dorothy L. Bennefeld Managing Editor

Robert L. Hensley Art Director

JOC Dick Benjamin  
Michael G. McDonell Associate Editors

Helen F. Collins Editorial Assistant

Cdr. Donald E. Maunder Contributing Editor

Harold Andrews Technical Advisor



## COVERS

On the cover, an RF-8g of VFP-63 makes a landing on USS Coral Sea (CVA-43). In the NASA photo above, the prime crew of Apollo 14 participates in command module simulation training at the Kennedy Space Center. Left to right are Astronauts Edgar D. Mitchell, lunar module pilot; Stuart A. Roosa, command module pilot; and Alan B. Shepard, Jr., commander.

Published monthly by the Chief of Naval Operations and the Naval Air Systems Command to provide information and data on aircraft training and operations, space technology, missiles, rockets and other ordnance, safety, aircraft design, power plants, technical maintenance and overhaul procedures. Issuance of this periodical is approved in accordance with Department of the Navy Publications and Printing Regulations, NAVEXOS P-35. Send mail to Naval Aviation News, Op-05D, Navy Department, Room 1132, 801 North Randolph Street, Arlington, Virginia 22203. Telephone 69-24819. Annual Subscription rate is \$5.00 check or money order (\$1.25 additional for foreign mailing) made payable and sent to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. A single copy costs \$45.



*The utilization of space truly has been a national effort; the talents of the military services have been invaluable through these years. The United States Navy has played a particularly important part in the development and final realization of that enterprise.... The United States has established its lead as a space-faring nation. I, for one, as a Naval Aviator, am honored to have been in at the beginning and feel fortunate to have had a continuing role in this great effort.*

*Captain Alan B. Shepard, Jr., USN*

# EDITOR'S CORNER

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Aviators, who may have thought that they could go out, hop in their flying machines and be above it all when it comes to ecology controversies, had better take another look. Aside from those little reminders such as finding that the weather at your destination is 502K, and being able to check the surface wind en route by watching vari-hued smoke pouring forth below, our high flying airmen may feel that the subject of air pollution has not yet gotten off the ground. However, if, while checking one of those stacks for current surface wind, you happen to notice a small light plane circling in the vicinity with a photographer hanging out one side, be advised that the airways have become the beat of some 158,000 pilots of the Aircraft Owners and Pilots Association (AOPA) who have taken on the task of locating and photographing major air polluters. AOPA members send their photos to local or national air pollution control authorities for follow-up action. Their president, Max Karant, says that "if all the public talkers really mean what they say, hardly anyone can help them more than our members going about their daily flights." He urged all AOPA members to take a camera along when they fly. While the AOPA program is not aimed at any specific industry or air pollution source, the photo documentation is expected to aid in promoting corrective action. At this point, we might caution a few of those multi-engine plane commanders we know who tend to set up a low visibility condition in the cockpit just after level-off with their favorite El Polluto. Beware — that Piper off your wing might just make you the object of his "Candid Camera."

The Federal Aviation Administration also has some words for us on aviation and air pollution. According to a study completed for FAA at Rutgers University, if rush hour commuters were to travel from suburban areas to downtown business sections in currently available aircraft, they would generate only one-eighth the air pollution now emitted by their private automobiles. The survey was made in the tri-state area of New York, New Jersey and Connecticut, where it is estimated that some 40 tons of pollutants pumped into the atmosphere during morning and evening commuting periods could

be reduced to only five tons if the commuters would switch to air travel.

Another subject which seems to gain considerable public attention from time to time is the conflict of interest issue. Therefore, before bringing you this next piece of information, we thought it best to check with one of our contributors. He assures us, however, he has no connection with the Pettibone Corporation of Rome, N.Y., which has produced a prototype aircraft recovery crane for shipboard use. Gramps says they are not even relatives. However, the new device, which satisfactorily passed initial tests during operational evaluations at NATC Patuxent River, should be of interest to all safety minded aviators. The vehicle, which is designed to hoist all CVA-type aircraft, has a clear-out reach of 17 feet and can be operated by one man either from the cab or remotely by cable from up to 50 feet away. The "Pettibone" weighs in at about 148,000 pounds and features an all-hydraulic lifting system powered by pumps driven by its diesel engine. Various modifications have been recommended for shipboard use, including a fogging nozzle attached to the lifting arm to give a fire-fighting capability and armor for the cab and fuel tank to better protect the vehicle and its operator during any flight deck mishap.





1911

1971

## Data Recorder Tested

PATUXENT RIVER, Md. — The Naval Air Test Center has devised a method of locating aircraft downed at sea. Called the Crash Position Locator/Flight Data Recorder (CPL/FDR) system, it will soon be installed in 106 *Orions*.

CPL/FDR is a performance monitoring system which collects propulsion, control and flight data along with voice transmission, and stores 32 channels of multiplex data on magnetic tape. The previous 30-minute history is always available due to an erase-while-record feature. The tape recorder and a radio beacon are imbedded in the deployable airfoil which is jettisoned upon crash impact.

The airfoil's own spoiler action insures that it will glide free from the crash site. The fiberglass and foam shape will resist impact, fire and immersion, and its beacon will transmit up to 48 hours at  $-32^{\circ}$  C. The airfoil is recoverable following release from any point in the airplane flight envelope.

Previously, searchers had to rely on locating debris or oil slicks to determine a crash sight. Often the debris recovered did not tell the story, and only presumptions could be made about the cause of the crash.

NATC's evaluation of the CPL/FDR included 29 flight tests of the feasibility demonstration model, in 1969. Flight tests of the test production system were completed in October 1970. During these tests, the airfoil was deployed with the airplane in various simulated crash attitudes, including maximum limits of bank, pitch and yaw, and at speeds from stall to maxi-

mum. Film coverage and theodolite tracking were used to establish airfoil trajectory and ground impact velocity.

NATC Patuxent River is also establishing a program for the development, test and evaluation of a similar CPL/FDR for the C-2, and plans are being formulated to incorporate the system in E-2's and in the RDT&E models of the S-3A. Future developments of the system will include incorporation of radio beacons which will be compatible with the Global Rescue Alarm Net satellite alerting and locating system being developed.

## Maintenance Pays for Miramar's VF-191

NAS MIRAMAR, Calif. — "The pilots of VF-191 are very proud to be flying the best looking and best maintained aircraft in the fleet," wrote Commander G. A. Aitcheson, commanding officer of *Satan's Kittens*, in his squadron's December 31 plan of the day.

The comment was inspired by the squadron's success in a recent post-deployment corrosion control inspection. Squadron grades, computed by representatives of ComFAirMiramar on a 100 percent scale, were not less than 95 in any of four areas of consideration.

The inspectors based their grades on the absence of corrosion and bare metal on the exteriors of the squadron's *Crusaders*, the overall physical appearance of the aircraft, and on the log book. The squadron had just completed a seven-month cruise, but everything was shipshape.

Preparation for the post-deployment

corrosion control inspection started during the cruise with some 5,000 man-hours expended on corrosion control. Corrosion control efforts contributed significantly to the squadron's availability in WestPac.

If readiness is the measure of a squadron, VF-191 is ready. In discussing the inspection, squadron assistant maintenance officer, Lt. Eugene P. Feist, remarked, "Our airplanes could go back on cruise right now."



## From Out of the Past

SAN DIEGO, Calif. — In the photo above, former Navy pilot, Robert Thomas, and his wife look at the *Hellcat* Thomas was forced to ditch off California 26 years ago. The F6F was discovered last March in 3,400 feet of water, 12 miles off San Diego, by Lockheed's research submarine, *Deep Quest* (*NANews*, December 1970). An M-2 .50 caliber machine gun from the wing was later taken to the Naval Weapons Laboratory, Dahlgren, Va., for test firing. There was little evidence of corrosion or other deterioration after the lengthy saltwater bath. Cleaned and lubricated, the weapon fired without a stoppage or mechanical failure.

## World Distance Record Claimed by Pax P-3C

WASHINGTON, D.C. — The Navy claimed a world distance record recently in the heavyweight, turboprop class when a P-3C from the Weapons Test Division of NATC Patuxent River, Md., flew nonstop and non-refueled from Japan to the East Coast.

The *Orion*, piloted by Commander Donald H. Lilienthal, flew 6,087 nautical miles — a significant increase over the 4,137 nautical mile distance record set by a Soviet IL-18 turboprop aircraft in 1967.

With a crew of ten, the *Orion* departed NAS Atsugi, Japan, at 5:30 p.m. (EST), Thursday, January 21, on a great circle course over the Aleutian Islands, Alaska and Canada. It arrived at NATC Patuxent River, 15 hours and 21 minutes later.

The aircraft is a production model of the P-3C. It has no engine or fuel system modifications and its configuration is typical of the *Orions* in use by Naval Aviation squadrons.

The flight was conducted according to Federation Aeronautique Internationale (FAI) rules in coordination with the National Aeronautic Association (NAA). The NAA, U.S. affiliate of the FAI, must verify the record before it is officially recognized.

The P-3C's flight from Atsugi underscores the Navy's capacity both for performing singular and self-sufficient ASW operations over extended distances and periods of time with minimal support, and for carrying out long-range reconnaissance.

## New U. at Whidbey

OAK HARBOR, Wash. — Naval Air Station Whidbey Island and Skagit Valley College of Mount Vernon, Wash., celebrated a first with the dedication of a branch campus here last August. Now the new campus, the first joint Navy-civilian venture on the West Coast, is registering students for the college's second quarter of daytime classes.

The idea of a full-time college branch at the naval air station was generated from night courses which have been offered by Skagit Valley College since 1968. The courses were so well received that the college, in cooperation

with the air station, decided to establish the Whidbey Branch of Skagit Valley College aboard the station.

Building 11 on the seaplane base side of the air station was designated the campus for the new college. (The building had once served as the station hospital.) The Navy remodeled it and, in August, preparations were completed and the new campus was dedicated.

In the first quarter, 622 students, active duty military, dependents and civilians of the Oak Harbor area, registered in 55 different classes.

## S-3A Engines Tested

LYNN, Mass. — General Electric's Aircraft Engine Group recently completed 4,000 engine-testing hours on its TF-34 turbofan engine which it is developing for the Navy's S-3A anti-submarine warfare plane.

The 4,000 hours were accumulated

### Turbulence

The Federal Aviation Administration will sponsor a three-day symposium on aviation turbulence beginning March 22, 1971, at the Twin Bridges Marriott Hotel, Washington, D.C.

The symposium will provide a unique opportunity for leading experts in specialized areas of turbulence to exchange information. Although a definite symposium agenda is still being developed, it is planned that presentations and floor discussions will include:

Wake turbulence — the results of extensive flight tests conducted early this year to investigate the trailing wing tip vortices of large aircraft.

Clear air turbulence — developments in the detection and avoidance of the invisible CAT phenomenon, the cause of unexpected rough air encounters resulting in occasional damage to aircraft and injury to passengers.

Wind shear — new techniques for measuring and identifying this sharp division of air masses having diverse movement and velocity.

Thunderstorms — an updating of knowledge, procedures and equipment for coping with this source of operational turbulence, and

Turbulence plotting — new techniques for instantaneous plotting and display of turbulence to airmen.

Inquiries should be addressed to: Federal Aviation Administration, 800 Independence Avenue S.W., Washington, D.C. 20590, Attention: FS-60.

on eight full-scale engines during the past 18 months. Maximum guaranteed thrust of 9,000 pounds was demonstrated on the second engine that went to test. Predicted long life and mechanical integrity of the early engines were proven by several 150-hour unofficial qualification endurance tests.

Among the tests run were: TF-34 capability for operation during steam and water ingestion, inlet distortion operation, and infrared and smoke measurements.

Accumulation of the test hours required by the Navy contract was planned to ensure timely and successful completion of the preliminary flight rating test (PFRT) and model qualification test. PFRT is scheduled for completion in April.

An extensive flight test program is planned for early 1971 in a modified B-47 flying test bed. Modification of the B-47 is nearing completion at GE's flight test center at Edwards AFB.

## Mothballs for Charlie

NAS CORPUS CHRISTI, Texas — "In view of the age and material condition of the aircraft, transfer to Davis-Monthan Air Force Base for storage." That teletype message doomed another C-117 *Gooneybird* to mothballs. Age caught up with VT-29's "Charlie-14."

Designed and built in the mid-1930's by Douglas as a medium-range, low-wing land aircraft, the DC-3 was used as a cargo, personnel and ambulance transport. Known first by the military as the C-47, the DC-3 was the workhorse of both military and civilian aviation for over a decade. It flew "over the hump" during World War II, participated in the Berlin Air Lift in 1948 and was the primary commercial airliner for many years.

Technology has long since left the *Gooneybird* behind, but with modifications it has remained useful. For the past decade, it has served VT-29 as a navigation trainer. Charlie-14, one of three C-117's used by VT-29, is the first of this trio to be sent to the aircraft graveyard at Davis-Monthan Air Force Base in Tucson, Ariz.

For ten years, the C-117 contributed to VT-29's safety record of over 124,000 accident-free hours.

The squadron's remaining C-117's will be retained, but it is expected that the time will soon come when they will join Charlie-14.

# VRC-50 Lends a Helping Hand

NAS ATSUGI, Japan — VRC-50 is playing a key role in making life better for South Vietnamese Navy men through a program called Operation *Helping Hand*.

Part of the program is an animal husbandry project — to introduce pork and chicken into the daily diet of Vietnamese Navy men and their families. The squadron is helping to accomplish this goal by providing transportation between the Republic of the Philippines and Vietnam, for the required livestock.

About 70,000 chickens and several hogs have already been delivered to farms throughout South Vietnam. Ultimately, it is hoped that all 46 Vietnamese naval bases will benefit from the program.

Operation *Helping Hand* begins at a large American farm near Sangley Point, R.P. Eggs are brought from the farm, hatched in incubators at Sangley, and VRC-50 flies the baby chicks, packed 100 to a box, to air bases in South Vietnam.

After the squadron unloads the chickens, they are taken by truck to small farms near the naval bases. There, American advisors are assigned to help teach Vietnamese farmers how to care for the poultry.

The whole process demands careful planning. The birds must arrive at their destination within 20 hours after hatching. That is when they need their first food and water.

In time, it is hoped that the program will result in chicken and pork becoming a part of the daily diet of the average Vietnamese Navy man, rather than the luxuries that they are now.

## Drone Recovered by Mid-Air Catch

EL CENTRO, Calif. — Lieutenant Commanders M. A. Cosby and Dale Larson, test pilots from NATC Patuxent River, Md., recently made the Navy's first mid-air recovery of a drone during an exercise over the desert near here.

Flying a specially configured SH-3A, the duo made the recovery as part of an

evaluation program to develop procedures for the Mid-Air Recovery System (MARS) and to qualify the *Sea King* for this recovery system.

MARS will enable the Navy to retrieve airborne packages in mid-air. Initial testing is aimed at recovery of target drone vehicles which deploy parachutes and descend to earth after completing their mission.

The drones are damaged during or after landing because the wind drags them over the ground. Additionally, time is spent in search and recovery of the expended drone.

Catching the drone in mid-air and flying it back to a pre-designated site saves money by both timely recovery and re-use of the undamaged target. Other foreseeable uses include intercepting returning packages from space exploratory systems and weather data recording packages.

The MARS concept calls for the payload package to descend on a main parachute with a second, smaller engagement chute riding above the main chute. A load line is attached from the engagement chute to the payload.

MARS helicopters employ an energy absorbing winch and a fairing to lead the winch cable outside the helicopter.

The cable terminates in a loop which incorporates three hooks to snag the descending parachute. Two poles are hydraulically extended below the helicopter to support and spread the loop.

The pilot maneuvers the helo so that one or more hooks catch the engagement parachute. Then the cable is pulled free of the poles, the main chute separates from the payload, and the winch pays out until the pre-set brakes decelerate it to a stop. The winch operator reels the cable in until the package is brought to a stowed position under the helicopter for return to the launching area.

Associated equipment for the system is located in the cargo compartment with the winch cable entering the aircraft near the helicopter's center of gravity. Hydraulic and electrical power is obtained from the helo's utility hydraulic system and the DC electrical system.

If mid-air retrieval is not feasible or is unsuccessful, an unassisted water or land pickup can be completed with the rapid pickup assembly.

Following satisfactory completion of the evaluation, MARS will be used to recover a descending package of 2,500-pound maximum weight.





# GRAMPAW PETTIBONE

## Fatal Flirt

The 1530 brief in the *Phantom* ready room was for air intercept practice. The air plan and air wing SOP called for the fighters to pick up 1,500 pounds of fuel from the airborne A-3 tanker at 10,000 feet.

The senior lieutenant commander and carrier air wing LSO briefed his crew to rendezvous with the tanker immediately after takeoff, get their fuel and then continue with the mission. There was no joint brief with the tanker as the inflight refueling was routine.

The 1700 launch from the large CVA went without incident; however, the *Skywarrior* rendezvous with the off-going tanker at 9,000 feet to consolidate fuel could not be completed because of a malfunction in the off-going aircraft. The lead F-4 *Phantom* soon joined on the tanker's port wing and, after an exchange of hand signals and a radio check, the drogue was extended. The tanker continued in its 10° to 15° banked port orbit of the CVA. Fueling proceeded normally and was soon completed. Then the F-4 pilot disengaged, retracted his refueling probe and joined in a tight parade position on the starboard side of the tanker. The tanker's wing overlapped a portion of the *Phantom* "to allow the navigator to read the *Phantom's* side number for his fuel record."

The tanker pilot, a commander, noticed his right wing being pulled down and looked out the right side of his aircraft. He could see only the upper part of the vertical fin of the *Phantom*, very close aboard. He then felt a bump on the right side and immediately saw the twin exhaust pipes of the F-4, very close ahead. The canopy then imploded and, with the rush of flying plexiglass and air, his helmet was blown off.

After stabilizing the tight parade formation, the lieutenant commander *Phantom Phlyer* applied full power and watched the KA-3 cockpit until it disappeared from his peripheral vision. He then pulled back hard on the stick and commenced a climb. The aircraft



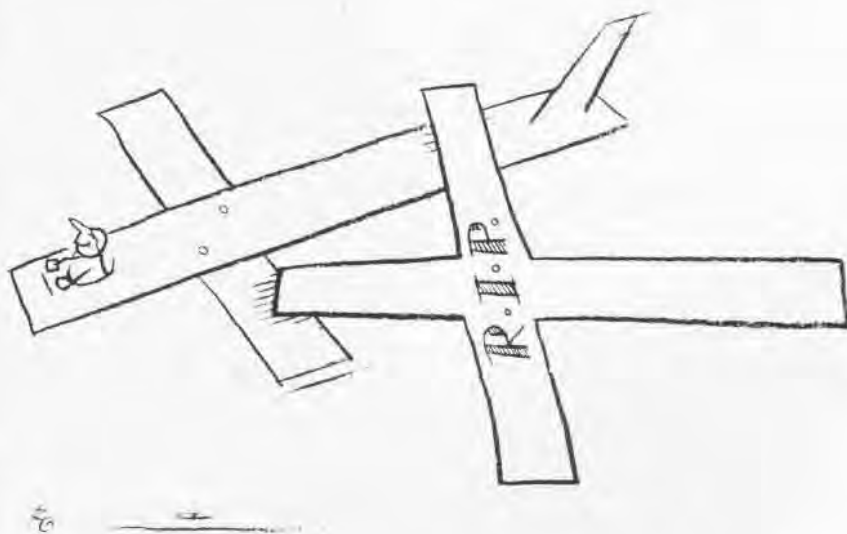
jostled about, made three or four very rapid, violent longitudinal oscillations and settled down. The F-4 radar intercept officer then observed the tanker at the seven o'clock position with what appeared to be a large part of the back radome missing from the nose. At the same time he saw a large object come from the upper starboard portion of the cockpit; a little later, at some distance, he observed another large object leave the cockpit area.

A large white parachute was sighted by the F-4 crew. They orbited and watched until it disappeared into the water. It was later learned that the parachute was the F-4 drogue chute.

Damage was minimal and the F-4 was easily controllable. A divert ashore was ordered and, after landing, it was discovered that the drogue chute and door, as well as the port outer stabilator section, were missing. The starboard stabilator inner trailing edge was also bent upward.

After the collision, the tanker's bombardier/navigator glanced around the cockpit and observed that the third-crewman seat was empty and that the lower escape hatch was still closed. The commander gestured with his hand to blow the escape hatch and bail out. In the process of leaving, the B/N noted that the top of the cockpit was completely missing. He made a somewhat rapid descent because of a damaged parachute canopy and was soon rescued by the plane guard helicopter.

The pilot then checked the cockpit, saw no one else around and proceeded to slide out the escape hatch. During his parachute descent, he saw no sign of any other aircraft or parachute. After landing, he was picked up by one of the escort destroyers. The third crew-





man was never seen, and there was no sign of him after the collision.



**Grampaw Pettibone says:**

**Sufferin' souffléed catfish! Don't this one really wilt the lily on the bush. Why this otherwise mature, professional Naval Aviator suddenly shifted control to the seat of his pants, we'll never know. Maybe he does. But the life of that airman will weigh heavy on his conscience for many a year.**

**We can't none of us live long enuf to make all the mistakes there are to be made. We gotta learn from the experience of others or we won't be around long enough to enjoy that place in the country.**

### All Fogged Up

Following a thorough and extensive briefing in the ready room, the experienced lieutenant commander manned his A-7B *Corsair II* for a scheduled night strike mission from the CVA. After a normal preflight inspection and start, the aircraft was taxied forward and positioned just aft of the port catapult. Wings were spread and locked with no difficulty, and the lieutenant commander was shown the weight board. After a change from 34,000 pounds to 33,500 pounds, he approved the reading, replaced his flashlight in his survival vest and taxied onto the port catapult.

Ordnance personnel armed the guns, the aircraft was tensioned and the pilot applied full power. He conducted his usual cockpit checks which included retracting the nose tow bar and checking the engine pressure ratio, oil pressure and hydraulic pressure. All indications were normal. He turned the doppler radar to the sea position, turned on his computer and switched the IFF to normal.

Visible moisture then began to come out of the air-conditioning vents. The pilot checked the air-conditioning switch in the 12-o'clock position and in automatic. When he turned the switch to the full hot position, the vapor disappeared. He re-positioned the switch to the one-o'clock position and waited a few moments to see if this corrected the problem. No moisture was visible, so he turned on his exterior lights as the signal that he was ready to go. The catapult officer gave the signal.

Almost immediately, vapor again appeared. The cockpit quickly and completely fogged up so that he couldn't



see the instrument panel. Dilbert removed his left hand from the throttle grip while he turned the air conditioning to full hot with his right hand. He was still looking down and to the right at the a/c switch when the catapult fired. He returned his right hand to the stick and, with his left, pushed the throttle lever forward from near the idle stop where it had moved at the start of the catapult stroke (throttle friction wasn't on).

He re-positioned the stick in what he felt was the normal position; however, he was still unable to see any of the instruments. Off the end of the cat, the rudder shaker began and the pilot also noticed a buffet. Still without instruments, he eased the stick forward and, at the same time, the top of the cockpit began to clear. He saw what he thought was the horizon below the canopy bow and felt as if he were flying into the water. As he reached for the secondary ejection handle, the radar altimeter warning light glowed red through the fog. He pulled the handle and ejected.

Ejection was normal and, after one swing of the deployed parachute, he entered the water. He inflated his Mk-3C life preserver and was dragged five to ten feet before the parachute collapsed. As the ship bore down on him, he became extremely anxious to get free of the parachute. He turned on his strobe light and searched vainly for the Koch fittings. After the ship had

passed, he finally found and released the fittings but was unable to free his feet, which were entangled in shroud lines. Ending a futile search for his shroud cutter, he deployed his seat pan — a mistake: the seat pan also became entangled in the shrouds. He jettisoned the seat pan, pulled free of the last shroud line around his left leg and paddled clear.

The rescue helo approached but flew right on past. He frantically searched for a flare in his survival equipment!! The helo crew finally located him anyway and put a swimmer in the water who started out in the wrong direction. The lieutenant commander finally found a signal flare and diverted the swimmer his way. Other problems occurred, but the rescue was eventually completed and the wet pilot was returned uninjured to the flight deck.



**Grampaw Pettibone says:**

**Great horned toadies! This guy could'a got killed. He must've got up on the wrong side of the bed. From what transpired, you'd'a thought he was a nugget on his first night launch. Only a couple of small (?) errors in correct procedures and the whole situation turned to worms in seconds. It's a cinch he wasn't mentally prepared for a survival situation in the water, either. The episode was actually a continuous search, often unsuccessful, for various items of survival gear. Perhaps others can learn from this expensive lesson.**



# AIR TO AIR WEAPONS

**A**ir-to-air weapons in use in the Navy fall into two categories — guns and missiles. In each case, their use depends on the attacking aircraft getting in a position where it is pointing toward its target, normally on its tail. Therefore, the first task in aerial combat maneuvering is to outperform the enemy by gaining a position in his rear hemisphere where the fight can best be controlled — and then attack and destroy him with the weapons available.

Today's inventory of weapons requires the fighter pilot to continue to use superior tactics and highly maneuverable aircraft in the launch/firing zone in order to make an attack. By the late 1970's, this should not always be the case. New air-to-air missiles being developed by the Navy under the watchful eyes of hard-driving project officers at the Naval Air Systems Command are fast on the way toward altering the rules of aerial combat.

Current weapons available to Navy pilots include *Sidewinder* and *Sparrow* missiles, as well as the fixed-forward-

By LCdr. Paul Mullane

firing 20mm automatic cannon, big brother of the machine gun which has figured in aerial warfare since World War I. However, today's versions would not be recognized by the "Red Baron" or his contemporaries. Though the usefulness of airborne guns was for a time thought obsolete for aerial combat, experience in Southeast Asia soon proved otherwise. There, the F-8, armed with both guns and missiles, was found to be much more effective in a dogfight situation than the all-missile armed F-4. The gun carried in the *Crusader* is the old reliable Mk 12 20mm aircraft gun which is the simplest in operation and serves the dual role of air-to-air and air-to-ground weapon. Its use dates back to the Korean War period.

The Mk 12 is described in Navy manuals as a high-cyclic rate, high velocity, automatic cannon. It is of gas-operated, electrical firing circuit design that, with feeder mechanism, weighs 102 pounds. The Mk 12 fires its 20mm

projectiles at a rate of 1,000 rounds per minute with a muzzle velocity of from 3,200 to 3,400 feet per second. Belted ammunition is fed to the gun by a pneumatic feed mechanism. The ammunition itself is 20mm in diameter, 7.22 inches long and weighs a little over half a pound per round. A variety of projectiles are used, including high explosive incendiary (HE-I), armor-piercing incendiary (AP-I) and armor-piercing tracer (AP-T), as well as test and dummy types. Identification of these projectile types is provided by color coding and labeling on the projectile body. Like all ammunition in use in Navy aircraft, each round has a non-percussion, electrically fired primer. The Mk 12 gun is found on the F-8 (four guns), A-4 (two guns) and A-7 (two guns).

A later development of the 20mm gun is seen in the Mk 11, which was developed by Navy ordnance expert, Frank Marquardt, after reviewing German WW II experiments with revolving cylinder designs. In time, using those design concepts as a departure point, he developed a two-barrel rota-

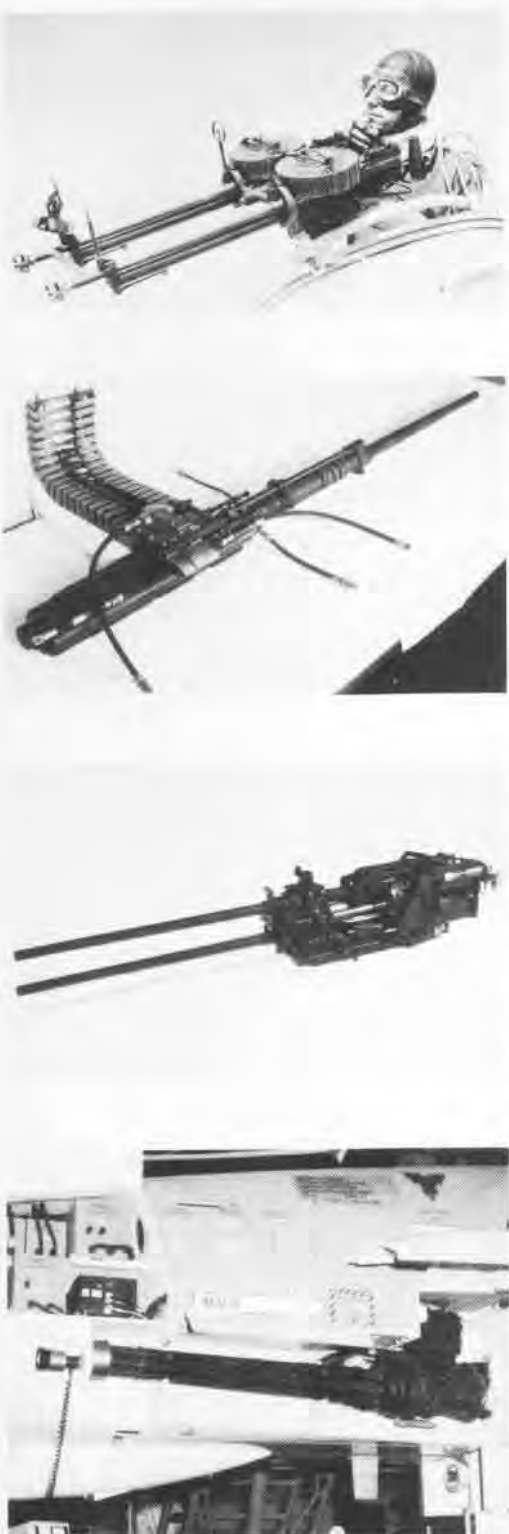


*The F-48 at left launches a Sparrow missile toward an airborne target while the Skyhawk, above, demonstrates another form of air-to-air weapon, the projectile firing Mk 11 gun. Below, 900 high-explosive armor-piercing rounds can be fired from the A-4's three Mk 4 gun pods in a little over 4 seconds.*

ting cylinder gun which converted recoil energy to rotating motion and that motion to return the gun to battery position. Designated the Mk 11, the gun fills an air-to-air and air-to-ground role, as does the Mk 12. Never mounted internally, except during recent experiments, the Mk 11, together with magazine and feed mechanism, is placed in the Mk 4 gun pod. In this configuration, the self-powered, self-contained, two-barrel, eight-chambered cylinder gun system is capable of being installed (loaded and ready to fire) on most external stores mounts, and can be jettisoned in an emergency. The pod is a supersonic shape with provisions for gun barrel removal and replacement through a quick disconnect system without resorting to removing the pod from the aircraft mount.

The Mk 11 has two rates of fire, the maximum being 4,000 rounds per minute. A unique feature of the Mk 11 gun is that reaction forces are reduced by selected firing of one or two barrels to cancel counter-recoil forces. The Mk 4 pod is designed to be utilized on a





*Twin Lewis guns, at top, were the most the Red Baron need fear. Below, in descending order, are the 20mm automatic cannons in the modern Navy inventory: Mk 12, Mk 11 and the six-barreled M61, shown on the F-14A mock-up.*

variety of aircraft, including those which would not normally carry guns, such as the F-4 and A-6. The A-4 and A-7 can also carry the MK4 pod.

The latest aircraft cannon used by the Navy is the General Electric-developed M61 *Vulcan*. This externally powered gun's six rotating barrels are capable of spewing forth 6,000 shots per minute. The M61 is mounted internally in the A-7E and will be carried in the F-14A when it joins the fleet. Ammunition for the *Vulcan* or "Gatling gun," as it is sometimes known, is the standard electrically primed 20mm M50 series round which is available in nearly the same range of projectiles as are used by the Mk 11 and Mk 12 guns.

Under development are two radically different types of ammunition and the guns to fire them. The Air Force is at work on caseless ammunition which, on firing, would leave no metal casing to be extracted prior to a new round being rammed into the chamber. This ammunition's projectile is to be slightly larger — 25mm. The Navy's project for a new aircraft gun is even more revolutionary. It also features a 25mm projectile, but the gun is designed to utilize a liquid propellant system which, in addition to doing away with the extraction function, also does away with the combined projectile/propellant round. A non-hypergolic bi-propellant will be injected into the chamber behind the projectile and ignited. As an obvious side effect, the cook-off problem will be circumvented. At present, laboratory type guns of this design have been built to check out components and operating principles, but the planned operational system has not yet been manufactured. When produced, the new gun is planned to feature four non-rotating barrels capable of a rate of fire of 1,500 rounds per barrel per minute. (The increased projectile size of 25mm was selected to increase the aircraft guns' target spectrum to include the medium tank and to bring down the tougher aircraft which may be expected in the future.) Due to the mathematics of projectile design, the additional 5mm increase over current naval aircraft cannon ammunition will actually nearly double the weight of projectile and high explosive delivered on an enemy target. Characteristics of the design will, at the same time, allow a reduction in the gun system's weight and volume, compared to

those now in use. The liquid-propellant 25mm gun is planned for fleet introduction in the late 1970's.

However, guns are but one aspect of air-to-air combat weapons. The missile is the other string for the fighter pilot's bow. Two missile types are now in the Navy inventory — *Sidewinder* and *Sparrow*.

*Sidewinder* has been around quite a while. The AIM-9A made its first flight at NWC China Lake in September 1953 and has since been followed by a long list of family members — AIM-9B, C, D, E, G, H, J — and now an L model in the planning stage. The first models (AIM-9A and AIM-9B) were passive infrared homing missiles which, on detecting a heat source, could fly to it and destroy it, leaving the pilot of the launching aircraft free to maneuver in any manner he desired after it was launched. A large number of fighter aircraft no longer in service (F4D, F11F, F3H and FJ) and the F-8's, F-4's and A-4's now in the fleet, could fire the AIM-9B. This model has now been relegated mainly to pilot training purposes as newer versions have come into the weapons inventory. *Sidewinder* is composed of four basic sections beginning with the guidance control group, including forward fins, a fuse, warhead and the propulsion motor weighing approximately 100 pounds. The 9B is 111½ inches long, weighs 163 pounds and employs a 25-pound Mk 17 warhead. Approximately 75,000 AIM-9B *Sidewinders* were produced for the Navy and Air Force between introduction and the last purchase in 1962.

By September 1955, two years after *Sidewinder's* first flight, development began on two advanced models designated AIM-9C and AIM-9D. The AIM-9C, a semi-active radar-guided version launched from the F-8 *Crusader*, remained in fleet use from December 1964 to August 1970. Its radar guidance tended to tie the pilot to the cockpit presentation during launch, and its use was complicated by its dependence on the aircraft's radar and increased maintenance requirements.

The second advanced model, the AIM-9D, currently in fleet use, featured an improved fuse and warhead, and greater total impulse from its motor, resulting in increased range and increased envelope acquisition in its infrared homing capability. The super-sonic AIM-9D may be utilized by the

F-8, F-4, A-6 and A-7's now in fleet squadrons and will be compatible with the systems of the F-14 and AV-8. The 9D's improved abilities are packaged in a 114 by 5 inch shape weighing 187 pounds and carrying a 25-pound Mk 48 warhead. The four 24-inch wings at the rear of the missile are equipped with rollerons — air-driven, stabilizing wheels at the end of each wing tip, designed to dampen missile roll. Directional control is maintained through four forward-mounted fins which are guided by a proportional navigation system providing constant course correction to keep a collision course with its target. The AIM-9D first flew in September 1958, was introduced into fleet service in 1964 and was produced until 1968.

In January 1968, a modification of the AIM-9D appeared as the AIM-9G equipped with Sidewinder Expanded Acquisition Mode (SEAM) which allows the missile's IR seeker to take a lead on a target not directly ahead of the launch aircraft at time of launch. This off-boresite acquisition further expands the firing zone of *Sidewinder*. It is possible for the *Sidewinder's* seeker element to detect a target prior to its detection by the aircraft's pilot. He is alerted to this detection by an aural tone in his headset. In SEAM-equipped missiles, the seeker scan can be slaved to the aircraft's radar scan. Now, a new advancement has been made and will soon enter fleet use. The AIM-9H, which is a solid-state electronics version of the AIM-9G, is now in pilot production and should be introduced during 1971. The improved electronics package provides increased reliability and maintainability over the 9D and 9G models.

The latest development in the *Sidewinder* family, AIM-9L will be a joint-service missile developed under Navy management. It is expected to serve as an interim air-to-air weapon until *Agile* reaches the fleet. AIM-9L is currently in the concept formulation stage and should enter the design stage this year. This latest model *Sidewinder* will feature an improved seeker element, improved acquisition, increased firing zone and more maneuverability due to an improved canard design, an active optical fuse and an improved warhead. Other versions, AIM-9E and 9J, are in the Air Force inventory.

The second air-to-air missile type presently in Navy use is *Sparrow*,



Missiles of the Sidewinder family are displayed at top, top to bottom: AIM-9B, AIM-9D and AIM-9C. Crusader of VF-194, center, sends a Sidewinder streaking toward its target. Ordnancemen aboard Ticonderoga load a Sidewinder on an F-8.

*Sparrow, below, currently fills fleet air defense role in addition to having improved dogfight capabilities. Phoenix, at right, is designed to take over long-range air defense missions when introduced for use with F-14 tomcat.*



another system that has been in service for a good many years. The current design is the third generation *Sparrow III* which, as AIM-7C, first flew in 1953 and owes some of its features to earlier *Sparrow* types dating back to 1946.

*Sparrow III* is now represented in the Navy inventory by three models AIM-7D, AIM-7E and AIM-7E2. AIM-7D is now used as a training missile while the other two versions are our basic fleet air defense missiles. *Sparrow III* features four cruciform wing and tail surfaces mounted on a 12-foot cylindrical body with an ogival radome nose. The wings have a span of 40 inches and provide both lift and maneuvering forces. The wings are moved in pairs by a hydraulically operated servo-system. Fixed tail fins give inflight stability. The missile is composed of six basic assemblies: x-band radar target seeker in the nose, autopilot to translate target data inputs to control signal outputs, wing hub with control mechanisms for the wings, a conventional explosive warhead detonated by a proximity fuse, a solid propellant rocket motor and fixed stabilizer fins.

The launching aircraft's radar performs search, acquisition, tracking and illumination of the target. Data is fed to the guidance section of *Sparrow* prior to launch, to prepare it for target acquisition. After firing the Mach 3+ missile, the pilot maintains his general heading to provide target illumination while *Sparrow's* propor-

tional navigation system keeps it on course to intercept.

AIM-7E provides increased performance capabilities over the 7D version and, as a result of lessons learned in Southeast Asia, a more maneuverable variation, the AIM-7E2, has been developed for close-in air combat. *Sparrow* missiles are currently in use on Navy and Marine F-4B's and F-4J's as well as USAF and certain foreign F-4 models.

The latest version of *Sparrow*, AIM-7F, is planned to replace the AIM-7E/7E2 for use with the Navy's newest fighter, the F-14. AIM-7F is now in development and will have greater range due to its larger solid propellant motor with two thrust levels — boost and sustain. It will retain the excellent short-range characteristics of AIM-7E2 and will be compatible with aircraft now using the E models. The F model is designed with all solid-state electronic circuits which permit more volume for other major missile sections, such as warhead and motor. Other features will include "snap start" capability giving improved reliability and pulse doppler in addition to continuous wave radar capabilities.

While the *Sparrow* and *Sidewinder* families of air-to-air missiles now dominate the scene, others are on the way. *Phoenix*, also known as AIM-54A, is under development for the F-14 air superiority fighter. The Hughes-built missile will measure 13 feet in length

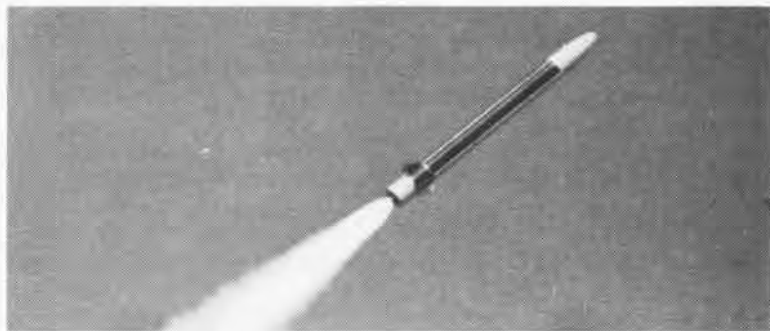
by 15 inches in diameter and weigh nearly 980 pounds. Its fins will extend three feet from its stubby looking body. Mounted on the F-14, *Phoenix* will have as its mission fleet air defense for long-range standoff protection of the task force, escort protection and area defense over a beachhead. Its long-range intercept capabilities can be directed against multiple-target raids by aircraft or cruise missiles. Furthermore, *Phoenix* is designed to operate in an electronic countermeasures environment where its multiple guidance phases and multiple control frequencies make it effective against all predicted ECM techniques. The F-14 *Tomcat* will carry six *Phoenix* on special removable pallets which may be removed for its "dogfight" configuration. *Phoenix*, together with the F-14/AWG-9 missile control system, will combine an advanced high power pulse doppler, lookdown, track-while-scan, multi-shot radar and fire control system with a long-range mid-course guidance, terminal homing missile. The AWG-9 will also display firing envelope information, for *Phoenix* and all other weapons (*Sparrow*, *Sidewinder*, *Agile* and the M61 gun) under maneuvering environments, to the pilot's heads-up display. The *Phoenix*/AWG-9 systems' digital computer allows the tracking of a large number of targets while the radar continues to scan for new targets. Test flights of R&D models of *Phoenix*



*Agile, center and bottom, is shown during test flights. Launch from QF-9G drone, at bottom, took place this past November. Phoenix missile shapes and removable launch pallets, left, have installation demonstrated on F-14A mock-up*

have resulted in unprecedented successes, including a hit at 78 miles, simultaneous launch of two missiles on two widely separate targets, each recording a kill and destruction of drones in "look down" attacks where conventional radars would have been confused by ground clutter.

Not as far along in development, but certainly a radical departure from previous design, is the Navy's future "dogfight" missile — *Agile*. This missile will have no wings and only very small stabilizing fins. Directional control will be provided by a swiveled propulsion nozzle which will introduce the first use of thrust vector control into a tactical missile. *Agile* is the planned replacement for *Sidewinder*. Its approximate eight-foot length makes it slightly shorter than *Sidewinder*, but its warhead is considerably more effective, and its maneuverability is remarkably increased over its predecessor. *Agile's* turn radius is better than anything that flies. A forward-fired *Agile* can turn and attack a target to the rear of the launching aircraft. This capability naturally greatly increases launch opportunity due to the enlarged operating envelope. Further, an aid to the pilot in employing this weapon is the planned use of a helmet-mounted sight tied to the missile's detection/tracking system allowing the pilot to fire on anything he can see. Fleet introduction for this deadly weapon is planned for the late 1970's.



# Measuring and Monitoring

**M**ilitary analysis has come a long way since Julius Caesar. When asked about one of his famous campaigns, Caesar is quoted as saying, "Veni, vidi, vici." We have come a long way since the Gallic wars. "I found the target, I fired, and I got a hit," will not do as an evaluation of modern missile firing.

In an air-launched missile firing, the pilot — seated in an aircraft moving at the speed of sound and surrounded by an imposing, complex array of instruments which must be continuously monitored — locates, tracks and intercepts another flying object moving at approximately the same speed. If all goes well, he performs many delicate and intricate operations, almost by reflex. And, in order to understand and evaluate the firing, such concepts as intercept geometry, altitude and speed differentials, performance envelopes, and a complicated lexicon of physical terminology (unheard of in the Fleet two decades ago) must be applied.

By Joseph Lewis and Carl Roberts

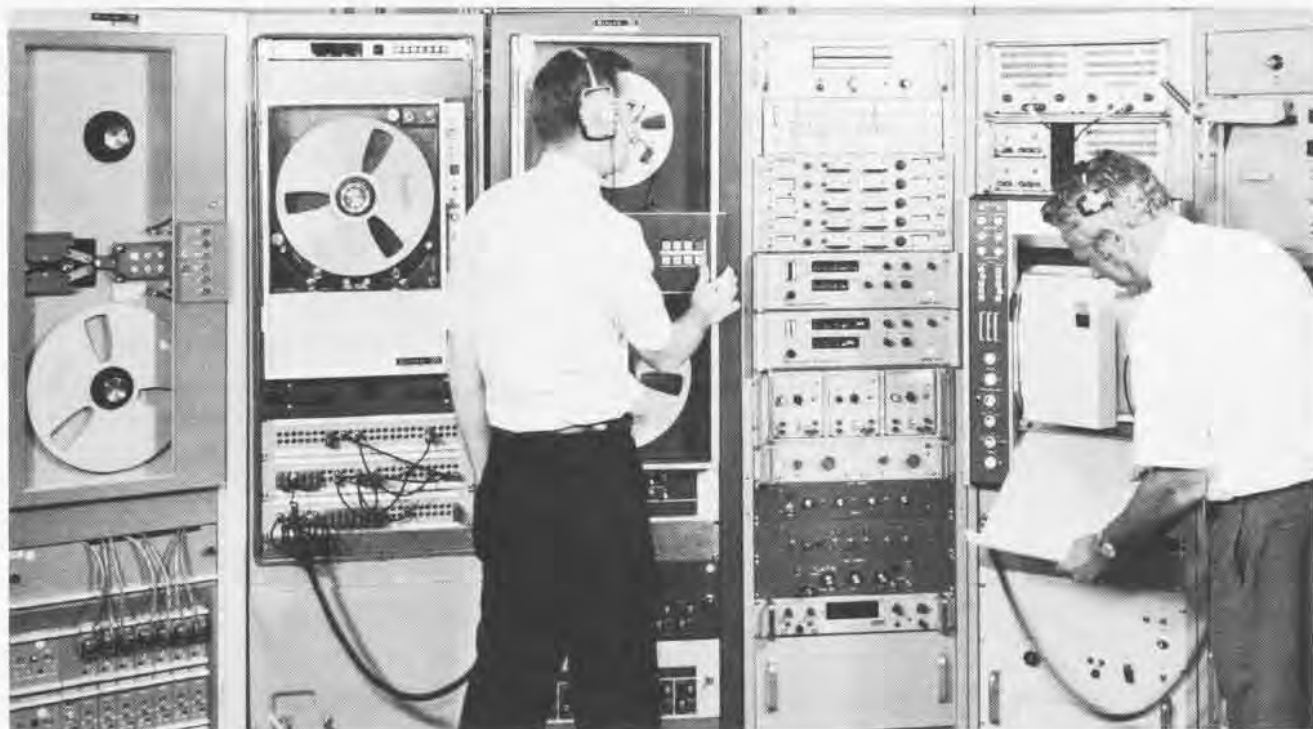
## Fleet Missile Systems Analysis and Evaluation Group

Assume that, although the pilot makes all the correct moves, the missile doesn't launch, or launches and doesn't guide, or guides and doesn't fuse, or perhaps does any one of these things poorly. What can the pilot, busy flying his complex aircraft, tell us about the event? Probably very little, for if the pilot misjudges, within a critical margin of a few feet, he can call a failure a success or vice versa. This is understandable when we consider that he must judge two supersonic objects — from a distance of several miles.

The U.S. Naval Fleet Missile Systems Analysis and Evaluation Group (FMSAEG), located at Corona, Calif., is aware of the long recognized fact that a man can make a mistake under such exacting circumstances. To ob-

tain accurate data on air-launched missile firings, FMSAEG has participated in the development and use of telemetric instrumentation created expressly to cope with microsecond technology. This program provides telemetry for Navy *Sparrow* firings, which not only accurately measures the miss-distance but also monitors vital missile and system functions, relaying the information to a ground station which records and analyzes it. The result is a "quick look" analysis of the firing, while the data are fresh and timely, which can be transmitted to the pilots. Ideally, preliminary firing results are in the ready room prior to the next firing hop.

Depending on the missile functional mode and the complexity of the telepack installed in the missile, a typical *Sparrow* firing tape will contain data on launch range, speed gate performance, miss distance, fuse action, and various parameters required to evaluate missile functions or to pinpoint





the cause of a failure. When these tapes are played back, the analyst has a significant and detailed record of the firing event. With a tape slowed down, the short interval between "pickle push" and the target intercept can be examined at length. When trouble occurs, the analyst can normally identify the problem, saving time, money, lives and, eventually, air battles.

The following examples of problems discovered and illuminated through in-flight telemetry indicate its versatility. In one case, three missiles which checked out satisfactorily on the ground failed to function in the air. Through analysis of telemetry results, both in-flight and on the flight line, the trouble was isolated to poor missile internal power unit chimney seals which allowed moisture into the missile. In another instance, telemetry records revealed excessive rocket motor delay times which caused degraded guidance and jeopardized aircrew safety. In one series of firings, a method of target presentation was found to prejudice firing results. One highly significant study revealed that aircraft equipped with and operating certain radar set groups could interfere with firings made by other aircraft in the vicinity. Other telemetry results have turned up consistent guid-

ance errors induced by avionics equipment utilized in the firing sequence. These and all other findings have been reported to appropriate project offices for engineering solution, and to training commands for application to training methodology. Add to these the many instances where preflight or in-flight telemetry has afforded an abort option, and the need for telemetry is well demonstrated.

FMSAEG currently operates six telemetry stations: two in the Pacific area, three on the East Coast and one in the Caribbean. Units for the Mediterranean and a western U.S. land range are nearing completion. In addition, the Pacific Missile Range supplies FMSAEG with telemetry records of air training missiles fired on their range.

As a result of a Federal Communications Commission decision to shift telemetry transmissions from VHF to UHF, FMSAEG is upgrading and modernizing its facilities to provide more and better data. Upgrading will also be accomplished by a new series of UHF telepacks. Current schedules call for the stations to be converted to UHF operation during 1971, meanwhile retaining VHF compatibility pending phase-in of the new telepacks.

In addition to receiving and analyz-

ing firing data, FMSAEG provides other services during a typical *Sparrow* exercise. For example, the original *Sparrow* telepack was designed to begin data transmission concurrent with missile launch. Since this gave no prior in-flight indication of system function, missile analysts wanted the telepack to operate continuously from missile power turn-on. With many firing planes in the air at one time, to avoid mutual interference, each telepack had to have a different radio frequency.

Borrowing concepts already employed at NMC, a flight-line check instrument was developed (for ground checks) which helped to assure separation of frequencies among missiles in the air at the same time. During flight-line tests, small refinements make it possible to verify missile tune — another useful service. Now, an aircraft with a "downed bird" can be spotted before takeoff, and a futile firing exercise aborted.

FMSAEG feels that telemetry has proven itself by assessing firing results and by providing in-flight records of missile functions and malfunctions. Telemetry adds to the cost of missile evaluation, but, considering the safeguards it provides against expending costly missiles, the Navy and the taxpayer get a bargain — in the long run.



*Inside of the mobile telemetry ground station during operations, left. Above, flight line test of missile is made prior to aircraft takeoff. The mobile van houses a telemetry ground station. Telemetry pack is tested before flight.*



PH1 Bob Woods



### Traffic Pattern

It's not poor parking, it's just an interesting composition of some Naval Aviation greats. These scale models were built by English model maker Joseph Thompson from plastic kits, modified with wood and paint, and were presented to the Navy in London.

### Atlas?

Not really. AMH3 E. H. Savage, VAQ-133, makes a final check on the bleed air outlets on each side of an A-3 engine before the Skywarrior takes off from Kitty Hawk (CVA-63).

PH2 Ron Stern





### Suspended

Under a parachute 82 feet in diameter, a Ryan Firebee drone descends earthward after successful completion of high speed target mission.



### Hard Starboard

Seeing is not always believing. That bend in Ticonderoga was not structural and the helmsman was not King Kong. A creative photographer gets all the credit.

GySgt. D. L. Baird



### Marked

An OV-10 Bronco from VMO-2 marks a target for an air strike in the Que Son Mountains, southwest of Da Nang, RVN.



# THE SELECTED AIR RESERVE

## First Commanding Officer

Captain Joseph E. Klause assumed command of a group of eight patrol squadrons to be located at naval air stations at Glenview, Jacksonville, Atlanta, Willow Grove, Washington, South Weymouth and New Orleans, when he became Commander, Fleet Air Reserve Wing, Atlantic, December 1, in a ceremony at the Naval Air Reserve Training Unit, Norfolk, Va.

Rear Admiral Mayo A. Hadden, Jr., was principal speaker at the establishment of the Fleet Air Reserve Wing, Atlantic. Headquarters for the wing is at NARTU Norfolk. Captain Klause will be assisted by an active duty staff of four officers and six enlisted personnel in directing, supervising and coordinating the training of assigned squadron personnel. His primary goal is to achieve and sustain a level of personnel and equipment readiness that will ensure availability of the air wing or individual squadrons for immediate deployment.

## Carquals

In November, Naval Air Reserve pilots from VF's-201 and 202 landed aboard the aircraft carrier *Ticonderoga* off the coast of Southern California. Flying needle-nosed F-8K *Crusaders*, the NAS Dallas squadrons went aboard the carrier during a two-week active duty cruise.

Pilots from both squadrons spent one week at Dallas in preparation. Both day and night flights provided each pilot with approaches and landings on a simulated carrier deck.

Pilots and squadron maintenance personnel next reported to NAS Miramar, and the flight deck personnel were then flown by helicopter to the carrier. Two days later, led by Commander John Lamers, C.O. of VF-201, and Commander Sam Jones, C.O. of VF-202, squadron pilots landed aboard *Ticonderoga*.

During their first hour, the *Prairie Aviators* recorded 18 traps. Before returning to Dallas, the squadrons participated in two days of carrier operations including arrested landings, catapult launches and airborne refueling. On the second day, the seas were running high, causing the deck of the carrier to pitch. Although this was somewhat of a handicap, the Reserves' boarding rate was termed "outstanding" by fleet observers.

## A Feeling of Patriotism

A Navy veteran, separated from military service for 19 years, considers his recent enlistment in the Naval Air Reserve at Whidbey Island a "personal patriotic privilege." He is Edwin L. Carson, a Marion County (Oregon) deputy sheriff with a background of 17 years as a law enforcement officer.

Carson's decision to re-enlist was prompted by his feeling that there is a decline in national pride and a lack of national purpose and direction among many Americans.

His thoughts about the Navy became more serious following a vacation in Mexico when he stopped to visit at the Naval Training Center, San Diego, where he completed basic training in 1948. Upon his return home, he wrote a letter to the Chief of Naval Operations, adding a postscript asking if the Navy would be interested in a 40-year-old veteran.

## Reserves at Point Mugu

The first VP-65 *Neptune* arrived at its new home at NAS Point Mugu from Los Alamitos in January.

Piloting the aircraft was Commander Thomas A. Trotter, squadron commanding officer. Copilot was Commander T. K. Harrison, the executive officer.

Established in November 1970 at NAS Los Alamitos as part of the reorganization of the Naval Air Reserve, VP-65 is a fleet size unit and will operate from Point Mugu as such.

Personnel of the squadron come from seven Southern California patrol units that were combined during the reorganization.

In addition to VP-65, Attack Squadron 305 and a Naval Air Reserve Training Unit are located at Pt. Mugu. Completion of the Reserve move is expected this month.

The officers and crew were greeted on their arrival by Rear Admiral Howard S. Moore, Commander, Pacific Missile Range; Captain Robert L. Pierce, NAS commanding officer; and Captain David Ailes, prospective commanding officer, NARTU.

This was the scene as VF's 201 and 202 pilots practiced carrier landings at NAS Dallas.



# Hurricane Hunters Get Snow Job

JACKSONVILLE, Fla. — National Weather Service forecasters are receiving help from *Hurricane Hunters* of VW-4 in keeping track of storms that annually dump snow on the northern East Coast. The *Hunters* fly their specially configured *Constellations* and *Orions* into the storms at altitudes of 600 to 1,500 feet over the ocean, gathering information needed by weather forecasters to better determine when and how much snow will occur.

The combined Department of Commerce and Department of Defense operation functions from the first of November through the end of March. The Jacksonville-based squadron is on immediate call to fly to the storms which often spring up off the East Coast in a matter of hours. Working closely with the newly formed Regional Weather Center of New York, located on the NYU campus in New York City, the *Hunters* gather information on temperature, humidity, winds and pressure. This information, immediately passed to the forecasters via radio, gives a precise picture of the conditions of the storm.

The new operation has also proved valuable for maritime purposes, providing warnings of high winds at sea.

## Ten Years of Safe Service for VS-35

NAS NORTH ISLAND, Calif. — What may be a record milestone in Naval Aviation history was reached by VS-35 in January when the squadron celebrated its tenth anniversary: since its commissioning in 1961, the squadron has logged 65,000 flight hours and more than 15,000 carrier landings, all without a mishap.

While accomplishing this record, the *Boomerangers* have won the CNO Aviation Safety Award three times.

Vice Admiral William F. Bringle, ComNavAirPac, commending the squadron, said, "It is remarkable to work in a carrier environment for ten years without an accident. Such an accomplishment is indicative of highly professional performance by all personnel serving in the squadron.



# Roll out the barrels

By JO2 Bill Honerkamp

**T**hey aren't as much fun as a barrel of monkeys or a barrel of beer, but these weren't meant to be; they are survival barrels.

It was tricky, but LCdr. Kenneth Sterling, in an NS Adak, Alaska, UH-2C *Seasprite* has delivered 12 of them to remote sites throughout the island. (Most are in the island's lower areas, but two sit on passes through the mountains.)

The only feasible way to deliver the barrels was to swing them from the belly of the chopper and fly them in. Sterling's flying was limited to days when there was little wind and no turbulence. Turbulence can start the external cargo swinging, causing a pendulum effect which makes the chopper uncontrollable.

The barrels, about ten feet long, four feet in diameter and weighing 960 pounds, were delivered by the *Seasprite* in a special sling made of nylon webbing attached to ears on the barrel, forming a Y-shaped harness. Then a steel cable was used to link the harness to a cargo hook on the helicopter.

The project was started by a sportsmen's club about two years ago. The club rounded up a dozen WW II water tanks from quonset huts around the island, rolled them to roads and then trucked them back to NS Adak.

During remodeling, each barrel was fitted inside with a flat plywood platform to form a floor, and the 3 x 6 fir planks on the ends were cut to make a door. Each barrel was altered to provide a dry cabin for up to three men, providing emergency refuge from the wind and cold for hikers and sportsmen who find themselves lost or caught in a sudden snowstorm.

All were painted a high visibility international orange, so they can be located easily. Then they were numbered — in hopes this would help orient a lost person. Sportsmen place the number and location on their personal maps.

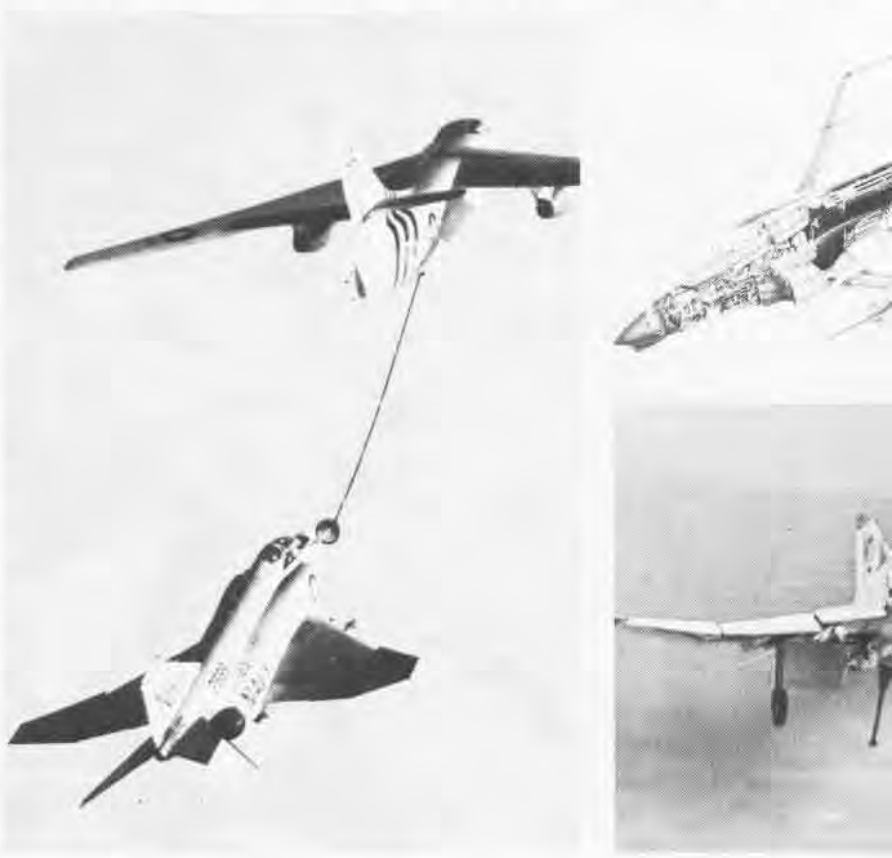
The barrels are not equipped with rations, and the club doesn't intend to stock them. Theory is that a conscientious outdoorsman carries chow with him when taking to the tundra.

The McDonnell *Phantom II*, originally designed as a long-range, all weather attack fighter, was to be designated AH-1. Requirements changed and so did the design of the *Phantom II* which, as the F4H-1, dropped guns from its design and replaced them with air-to-air missiles. A second seat was added for a radar intercept officer and, on its first flight in May 1958, the plane had essentially the same layout as current models.

The *Phantom II* features wings swept back at 45 degrees, a dogtooth leading edge and 12 degrees dihedral in the outer panels. The one-piece, all-moving horizontal stabilizers have 23 degrees anhedral. Variable area inlet ducts, monitored by an air data computer, feed correct amounts of air to the two GE turbojet engines. Fuel is fed to the engines from six internal tanks with a total 2,000-gallon capacity. External fuel may be carried in one 600-gallon, under-fuselage tank and two 370-gallon under-wing tanks. Inflight refueling is provided through a retractable probe on the starboard side.

The two-man crew has varied armament at its disposal. For air-to-air combat, six *Sparrow III's* or a combination of four *Sidewinders* and four *Sparrows* may be carried on four semi-submerged under-fuselage mounts and two wing mounts. An alternate load of 16,000 pounds of nuclear or high explosive bombs may be placed on five external attachment points.

Since initial flight trials, the *Phantom II* has been setting records for speed, altitude and rate of climb. First production models came off the line in 1961 and went to VF-101. The F-4J, is primarily an interceptor but retains full ground attack capabilities. Its drooping ailerons and slotted tail give it reduced approach speed in spite of increased weight.



# ANTOM II

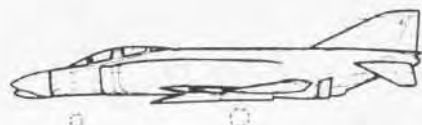
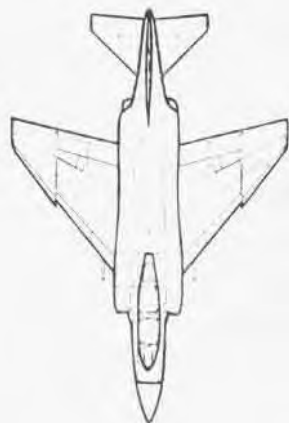


F-4J

F-4B



Length	58'3"
Height	16'3"
Wing span	38'5"
folded	27'6"
Engine: F-4B	J79-GE-8
F-4J	J79-GE-10
Thrust w/afterburner	
F-4B	17,000 lbs.
F-4J	17,900 lbs.
Max takeoff weight	54,000 lbs.
Max level speed	
(w/missiles)	Mach 2.23
Approach speed	135 kts.
Combat ceiling	58,200 ft.
Combat radius	
fighter	485 nm.
ground attack	470 nm.
Ferry range	
w/1,340 gal. external	1,800 nm.





## FLYING LABS

Naval Research Laboratory scientists continuously probe the sea, land and air for answers to scientific questions. Getting them where they need to go are 50 enlisted men and two officers of the lab's flight detachment.

Based at NATC Patuxent River, Md., the detachment flies three early models of the *Super Constellation* — flying laboratories that afford NRL scientists a method of conducting investigations and experiments that would otherwise be impossible.

Each *Connie* is loaded with scientific instruments, plus numerous external probes and antennas. Two planes also have wing-mounted pods for cloud physics research, navigation investigation and low-frequency radar study. The third is used for work with the four-frequency radar system, which permits studies of radar energy returning from a surface, and can be used to detect and monitor oil spills.

Many of the modifications to the *Connies* are not covered in the aircraft manuals, and one crew member notes that "so many changes have been made, it would be difficult to return the aircraft to their original configurations."

NRL missions extend from the deserts of Africa to the shores of Australia, and from the coasts of Alaska to the mountains of South America. The pilots, crews and scientists who fly the missions constitute a team that makes vital contributions to advancement in science and technology.



A flying lab carries scientists on a mission, top. Scientist Arno King operates an instrument control panel used in wave propagation studies, above. Technicians remove *Connie's* radar antenna, right.







# HAD LAUNCHER

By Ernest R. Sutton

## Museum Funds Needed

PENSACOLA, Fla. — The fund drive for the new Naval Aviation Museum is now in full swing. The Naval Aviation Museum Association, headed by Admiral A. W. Radford, USN (Ret.), has received more than \$1 million in pledges, mostly from aviation industries. The remaining \$3 million needed must now be obtained from contributions by those who have made and are now making Naval Aviation history.

According to Vice Admiral Bernard M. Streat, president of the museum, the goal can be met if each Naval Aviator will contribute ten dollars each year for the next three years. This is an opportunity for you to become a plankowner (all donors will be awarded membership in the Association), as well as to help build a living memorial worthy of the men of Naval Aviation.

Contributions are tax deductible and should be made payable to the Naval Aviation Museum Association, Inc. Mail donations to: Naval Aviation Museum, NAS Pensacola, Fla. 32508.

## Pacific Realignment

WASHINGTON, D.C. — The Chief of Naval Operations has ordered realignment of several activities, bringing about a change of homeport or deployment point for many units.

The biggest changes to date involve units in Japan. ComSeventhFt will move from Yokosuka to Sasebo in May, while four Naval Aviation commands began plans last month to shift from NAS Atsugi to new homeports: ComFAirWestPac moves to NAS Cubi Point, VQ-1 to NAS Agana, VRC-50 to NAS North Island, and HC-7 to NAS Imperial Beach.

When NS Sangley Point is returned to Philippine control later this year, the staff of ComUSNavPhil will move to the Subic Bay naval base. The West Coast fleet air wings and patrol squadrons presently deploying to Sangley will deploy to NAS Cubi instead.

On February 1, CVW-5 moved from NAS Miramar to NAS Lemoore and was placed under the administrative command of ComFAir Lemoore.

"Five minutes and counting," was the word from Art Smith, launch control officer (LCO), in the blockhouse at Point Mugu's Launch Pad Charlie.

Television monitors showed the picture of a radar acquisition tracking probe for active calibration (RATPAC) missile ready for launch on the pad, the first launch of a missile from the Pacific Missile Range's new High Altitude Diagnostic (HAD) Launcher.

The launch objectives were to exercise and check out USNS *Wheeling's* (TAGM-8) radar systems and operators under actual missile operating conditions and to qualify the HAD launcher into the range complex.

"Four minutes and counting," the LCO said.

"Hold fire!" the range control officer (RCO) chimed in. "We have a bogie in the impact area." It was a fishing trawler which shouldn't have been there and was then leaving at top speed.

"When can we resume the count?" asked the LCO over the phone.

"His top speed is nine knots. About 45 minutes."

"Can we change the area of impact?" the LCO asked.

"I'm trying to get clearance from Range Safety for a change so launch can proceed," replied the RCO.

The missile was expected to splash down some 35 miles from Point Mugu. From launch to impact, *Wheeling* radars would be tracking it.

If the HAD launcher lived up to expectations, it would be quite an improvement over its predecessor — easier to maintain push-button control on the pad, or remote control from the blockhouse with a digital readout of launcher settings on the remote control console. Also, it had been obtained at no cost to PMR from the U.S. Atomic Energy Commission in Albuquerque, N.M.

The launch was continuing. "Range Safety has cleared the change in the impact area," the LCO announced. "Change the azimuth to 220 degrees."

At this point, time was saved, be-

cause, by pressing a button in the remote control system, the missile's launch angle was at the correct reading. If this had been the old launcher, at least three men would have had to leave the blockhouse and make the change on the pad.

"Resume the count at five minutes" — from the operations conductor.

"Five minutes and counting," said the LCO. "Four . . . three . . ."

At three minutes, the missile was armed and ready to fire. At 30 seconds the firing button was pressed . . . the automatic launch programmer took over . . . the seconds ticked away . . . five, four, three, two, one . . . fire.

"*Wheeling* has acquisition and is tracking," the op conductor stated.

The new launcher had performed perfectly and was accepted by PMR operations. Already, another missile was being prepared for launch. The drama of the first launch was over and the routine of the second would begin a half hour later.





*Steady hands deftly attach a static line to a parachute used by students of Point Mugu's parachute club, above. Jumpmaster ATR3 Don Cruikshank does a body twist to demonstrate the way to keep from getting entangled in the secondary chute, left.*

# to FLY HIGH

**I** was searching for a way to put adrenalin into my life," says AQ3 Bill Pettingell, Pacific Missile Range, Point Mugu.

He found it — parachuting.

"I couldn't think of anything more exciting than falling through the air at 120 miles an hour with nothing but my parachute to slow me up," he concludes.

Pettingell and other servicemen in the Point Mugu, Port Hueneme and Oxnard Air Force Base areas received official permission to form a parachutist club at the naval air station. They jump on holidays and weekends when not on duty, and are able to use local aircraft because membership is limited to active duty personnel.

The Point Parachutists' first meeting last summer brought out 15 participants. Three weeks later, a dozen sailors had completed their first jump, and

in less than three months, 25 more members were taking jump instructions.

Members jump under FAA and U.S. Parachute Association (USPA) rules. An aerial safety office is in charge of clubs assigned in various areas designated by the USPA.

Under current safety rules, no jumps are made over water or at night, and no specialized jump can be made without permission from the ASO. New members are not allowed to jump if the wind is over ten knots, and they must use a static line.

ASO for the Point Parachutists is ATR3 Don Cruikshank, a jumpmaster with a "C" license. To hold such a license a person must have 100 or more jumps, perform all freefall maneuvers, and be able to train other students.

Future club plans include competitive freefall matches with other organizations in the area.

PH1 John Boravoy





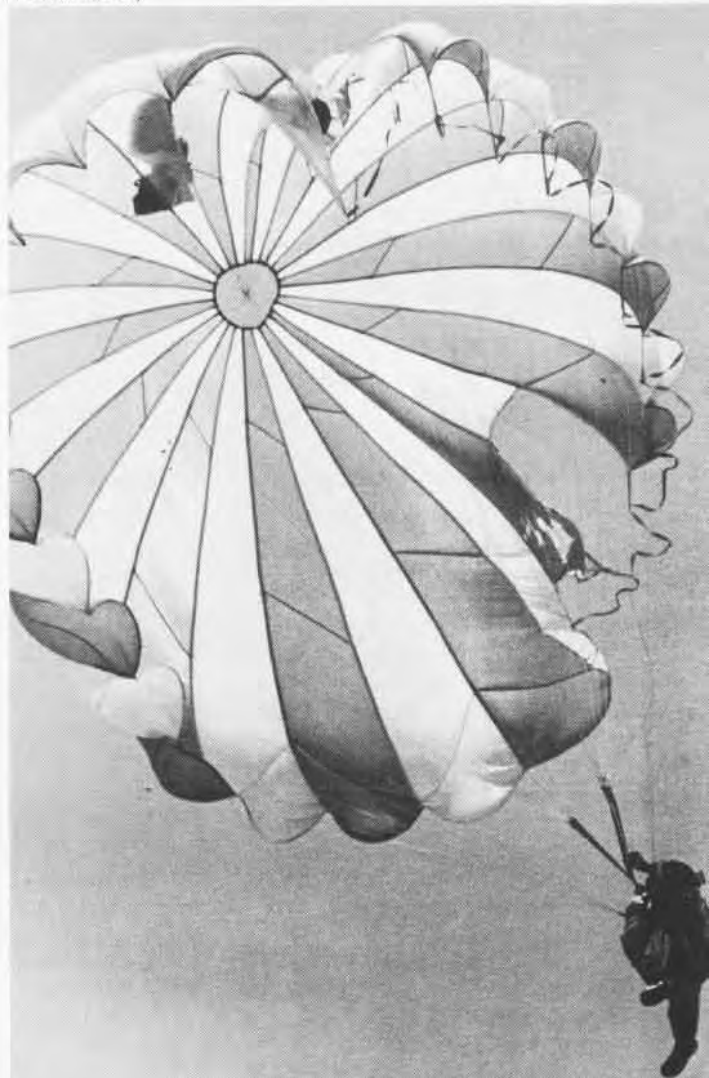
PH2 S. C. Wyckoff

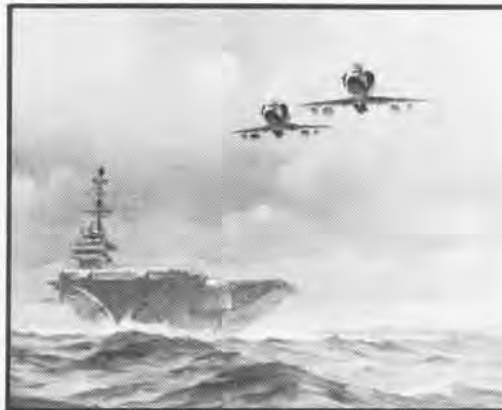
*Although it appears that Cruikshank is napping en route to a jump, he and another club member are discussing student jump order, above. A NAS North Island chutist demonstrates proper chute packing, below. A jumper manipulates his chute to face the wind so he can land in a predetermined area, right.*

PH1 John Borovoy



PH1 John Borovoy





# at Sea with the Carriers

## ATLANTIC FLEET

### *Saratoga (CVA-60)*

Rear Admiral Robert B. Baldwin recently assumed duties as ComCarDivSix in a ceremony aboard *Saratoga* at NAS Mayport, Fla. He relieved Rear Admiral James L. Holloway III who was promoted to vice admiral and assumed duties as Deputy CinCLant.

Rear Admiral Baldwin previously served as director of aviation plans and requirements division on the staff of DCNO(Air).

### *Forrestal (CVA-59)*

With lights flashing and sirens wailing, Santa Claus made an official visit to over 375 dependent children of *Forrestal* crewmen for a gala Christmas party aboard the ship.

Santa arrived riding the ship's MB-5 truck, which is better suited than his sleigh for driving aboard a carrier.

Festivities included gifts, cookies, candy, cake, cartoons and carols.

### *Wasp (CVS-18)*

This antisubmarine carrier has been named *Our Navy* magazine's "Ship of the Year" for 1970. The announcement of *Wasp's* selection was made by publisher Paul Watson, and the ship is featured in the magazine's January issue.

In nominating the carrier for the award, Vice Admiral R. L. Townsend, ComNavAirLant, said in part:

"Fiscal year 1970 was a year filled with honor and accomplishment for one of the Atlantic Fleet's finest carriers, the USS *Wasp* (CVS-18). With

nearly 28 years of service to the fleet, *Wasp* is still looked to as a pacesetter.

"In April 1970, USS *Wasp* was named the winner of the ComNavAirLant Battle Efficiency E and ASW Readiness A awards. In competition with other units, *Wasp* not only earned these honors, but her individual departments were singled out for fleet excellence. The air department won the yellow E; communications, the green C; engineering, the red E; medical, the blue M; and operations took the green E. *Wasp* also received the Meritorious Unit Commendation.

"*Wasp* has met every commitment and has performed every task in a thoroughly professional manner. There is no ship better qualified for the title 'Ship of the Year,' in 1970."

CVS-18 is presently operating in the eastern Atlantic with units of

CVSG-54 embarked. During this two-month cruise, *Wasp* is preparing for a battle readiness inspection, holding carrier training flights for aircraft, and conducting antisubmarine warfare patrols and exercises.

### *Independence (CVA-62)*

On a recent morning, *Independence* maneuvered in total radio and radar silence among Italian fishing boats seven miles off the heel of Italy.

One hundred twenty miles to the south, the cruiser *Columbus* and three destroyers were engaged in peculiar operations. *Columbus* was using the carrier's voice call sign on the radio and making course and speed changes as a carrier does during flight operations. The destroyers clustered around the cruiser the way destroyers cluster



SH-3A Sea King helicopters fly over USS *Wasp* (CVS-18) as the ship steams in the Atlantic.

around a carrier in normal convoy.

The day before, the carrier *John F. Kennedy* had departed Naples. The operations personnel aboard *Independence* knew this, but not her present location — and they did not know if *Kennedy* knew where she was.

Each ship was intent on sinking the other. The radar silence and pretend-carrier tactics of *Columbus* were attempts to fool *Kennedy* about CVA-62's position while *Indy* launched her search aircraft.

The sinkings would be make-believe. (The event was *CAWEX III*, an exercise designed to exploit the conventional air warfare forces of one carrier task group against the other.)

At 1050, the conning officer on *Independence* ordered 20 degrees right rudder and a course that put the carrier into the wind. He rang for a higher speed as aircraft on the flight deck started their engines. Catapult personnel made final checks and, at 1100, the *Independence* E-2A *Hawkeyes* began their search for *Kennedy*.

A half hour later, the *Hawkeyes* found *Kennedy*, and there was no indication *Independence* had been located. *Indy* strike pilots were briefed and ready to simulate bombing runs on *Kennedy* by the time the search aircraft returned. Meantime, other *Independence* aircraft successfully simulated shooting down 11 *Kennedy* planes which were fruitlessly searching for CVA-62.

In the next hour, *Independence* strikes took the ship's aircraft to the other carrier and, by 1230, *Kennedy* received the *coup de grace*. Five *Independence* aircraft buzzed *Kennedy*'s bridge as her own planes sat helplessly on the flight deck.

Not content to sink *Kennedy* and splash 11 of her planes, blood-thirsty *Independence* pilots proceeded to simulate sinking the carrier's largest escort ship, USS *Leahy* (DLG-16).

*Kennedy* found *Independence* the next day — but the exercise was over. A message from the "sunken carrier" simply said, "Nothing hurt here, except pride."

### *John F. Kennedy* (CVA-67)

So far, this Sixth Fleet carrier has had an event-filled cruise. One thousand crewmen and their families were reunited for Christmas; the carrier marked her 29,000th arrested landing;



More than 7,000 servicemen gather aboard *Kennedy* to greet Bob Hope and his troupe.

and the ship's flight deck was thronged with sailors watching the Bob Hope Christmas Show.

Two flights of *Kennedy* dependents landed at Athens International Airport December 21 to begin a 16-day holiday in Greece, as 450 sailors prepared for the return flight to spend Christmas with their families in the States.

CVA-67 unexpectedly deployed to the Mediterranean in late September, and two months later plans were begun for the "Petticoat Flight" as part of a pilot program planned by CNO to reunite families during the Christmas season.

Although the carrier's 29,000th ar-



Captain T. L. Johnson, C.O. of USS *Hancock*, cuts a ribbon of dollar bills as he opens the carrier's expanded disbursing office.

rested landing is not unequalled, *Kennedy* added a different catch — the aircraft was a helicopter.

As the final recovery was made during a day's air operations, *Kennedy* was still one landing away from the mark. An HC-2 helicopter approached the ship and an urgent call went out, "If you can throw anything out for a hook, you'll make history."

Pilot Ltjg. Mike Casella and his crew quickly checked their resources as the helo began the normal approach pattern for jet aircraft. As the helo approached the ship, the arresting gear crewman stood ready at the door to drop the hook — a rescue seat. The rescue seat/hook missed the number three wire, but Ltjg. Casella called on the unique capabilities of his aircraft and backed up two feet for a perfect landing.

After the hook runner ran half the length of the flight deck to disengage the hook, the helo taxied out of the gear and was welcomed back aboard the carrier in hero fashion.

More than 7,000 sailors from *Kennedy* and seven other ships anchored at Soudha Bay, Crete, assembled on the carrier's flight deck in December to see Bob Hope's 20th annual Christmas Show. The cast included Les Brown and his Band of Renown; Broadway and TV singer-dancer, Lola Falana; country and western recording star, Bobbi Martin; Cincinnati Reds' catcher, Johnny Bench; nightclub and



# Alive & Well

FM USS HANCOCK  
TO CNO  
ATTN OP-05D

LETTER TO THE EDITOR

SUBJ: STATUS OF USS HANCOCK

A. NAVAL AVIATION NEWS, DEC 1970

1. WISH TO ADVISE THAT HANCOCK IS ALIVE AND WELL ON YANKEE STATION. NOTWITHSTANDING THE COVER PHOTO CAPTION ON PAGE ONE OF REF A, WHICH IMPLIES THIS GALLANT VESSEL HAS BEEN DECOMMISSIONED, USS HANCOCK IS NOW ENGAGED IN HER SIXTH WESTPAC DEPLOYMENT SINCE THE GULF OF TONKIN INCIDENT IN 1964. AS WEARER OF THE NAVAIRPAC "E" FOR BATTLE EFFICIENCY, AND WINNER OF THE ARLEIGH BURKE FLEET TROPHY, HANCOCK PROUDLY OPERATES AS A UNIT OF THE SEVENTH FLEET. SHE CONTINUES TO MEET ALL COMMITMENTS, UPHOLDS HER OUTSTANDING REPUTATION, AND LOOKS FORWARD TO HER APPROACHING TWENTY-SEVENTH BIRTHDAY.

TV singer, Gloria Lording; 13 Gold-diggers from the Dean Martin show; Miss World of 1971, Jennifer Hosten; and actress Ursula Andress.

Hope's 15-day, 30,000-mile trip also included stops in England, West Germany, Thailand, Vietnam, and Korea.

## PACIFIC FLEET

### *Kitty Hawk* (CVA-63)

This supercarrier has hosted numerous distinguished visitors recently. They include His Eminence Terrence Cardinal Cooke, Military Vicar to Catholic armed services personnel; Admiral John S. McCain, CinCPac; Selective Service Director Curtis Tarr; Reverend Doctor Oswald C. J. Hoffman, Lutheran Layman's League; and a well-rounded fellow in a red and white flight suit.

Cardinal Cooke visited *Kitty Hawk* on Yankee Station as part of a tour of

military bases in Vietnam. He was accompanied by the Right Reverend Monsignor James Murray, the Cardinal's secretary. After dinner with the crew, Cardinal Cooke held mass and returned to Da Nang the next day.

Admiral McCain spent a day meeting with officers and crewmen of *Kitty Hawk* and CVW-11, and Vice Admiral Fredric A. Bardshar, ComAtkCarStrikeForSeventhFlt.

Tarr was aboard the carrier to talk with crewmen in preparation for testimony he will give before Congress concerning the draft, and Dr. Hoffman visited the ship as part of his annual visit to Protestant servicemen.

No one needs to be told about the fifth visitor — the one called Santa.

### *Bon Homme Richard* (CVA-31)

The last skipper of *Bonnie Dick* assumed command of the attack carrier recently at NAS North Island. Commander Donald E. Reh relieved Captain Frank T. Hemler who departed

for duty as Chief of Staff and Aide to Commander Carrier Division One.

Cdr. Reh reported aboard *Bonnie Dick* in July 1969 as operations officer and assumed duties as executive officer the following February. As the carrier's last skipper, he will guide CVA-31 through her inactivation and decommissioning which is scheduled for June in Bremerton, Wash.

### *Constellation* (CVA-64)

Captain Harry E. Gerhard recently assumed command of *Constellation*. He relieved Captain John M. Tierney, who served as the carrier's skipper for the past year.

Captain Gerhard previously commanded the ammunition ship *USS Great Sitkin*. He received his wings in September 1949 and has had a variety of tours which include C.O. of VF-103 and CVW-7, head of the Pacific area current plans section in CNO, and executive assistant and senior aide to DCNO (Plans and Policy).

# Fast Cats

Sending four jets streaking skyward in 20 seconds from two catapults is test enough for any catapult crew, including the crew aboard USS *Kitty Hawk* (CVA-63). Hook-up crews must attach the cat bridle to hooks on the aircraft after looping the wire around the shuttle on the deck. To keep the jet from galloping off too soon, they must attach hold-back fittings to the aircraft. Then, more fast action and a series of highly coordinated safety checks. After proper steam pressure is set, the catapult officer gets a salute from the pilot and signals launch. The deck edge console operator fires the catapult and, three seconds later, the plane, doing 150 knots, is on its way.



# LOX, CHOCKS AND PODS



*Whether it begins with a long roll down the runway or a short shot off a carrier deck, every flight of Naval Aviation begins with the Airmen Jones and Petty Officers Smith who operate the ground support equipment. Without the men and the yellow gear, a Navy aircraft goes nowhere. Towing a Crusader into position may present one problem, changing its tire, still another, but all are the responsibility of the men of the line crew.*

By PHC C. L. Wright







*That is lox going into the F-4J, above – not the delicatessen variety but the oxygen type needed for high altitude flights. Chocks are strategically placed while a tire is changed, left, while above, a GTC-85 gas turbine compressor, which furnishes the compressed air needed to start a jet engine, is pushed-pulled to the flight line. The men have one aim: Do the job right so the pilots and planes will return safely.*

# ON PATROL

*with the Fleet Air Wings*



**N**avy patrol missions encompass the globe and are never ending tests of men and equipment against long hours of flying around the clock in all kinds of weather.

Most operations are similar to those of the squadrons at NAF Naha, Okinawa, which rotate every six months and, when deployed, are under the direct operational control of Rear Admiral Richard E. Fowler, Jr., Commander Patrol Force Seventh Fleet; the squadron commander is assigned additional duties as Commander Okinawa

Air Patrol Group. The currently deployed squadron is Barbers Point's VP-6 commanded by Commander R. H. Botts.

Each squadron deploys with nine P-3 *Orions* and approximately 375 flight and support personnel. Patrols average 10 hours — and can last 16. On each mission, patrol planes with 12-man crews search thousands of miles of ocean, flying from close to the surface to 20,000 feet in an effort to detect deep-running enemy submarines. The sound of a cruising sub is

transmitted by sonobuoys dropped by the plane. Crews also identify and photograph all interesting ships, as they observe world shipping lanes and the movement of communist-bloc warships. Finding an unidentified submarine erases the occasional boredom of long patrols and allows the crew to use skills acquired on previous patrols and training exercises.

A hunter, the P-3 *Orion* can also be a killer, with its deadly array of detectors and weapons that can find, identify and destroy an enemy submarine.



Crew monitors P-3's flight instruments while radioman is in contact with headquarters.



*As patrol plane cruises on station, a pilot uses binoculars to identify a surface vessel. Tactical coordinator holds cockpit conference with plane commander on possible contact.*





## POW/MIA Policy

WASHINGTON, D.C. — As concern continues to mount over the plight of captured or missing U.S. servicemen in SEAsia, military commands can expect continued requests for assistance by private groups working in behalf of U.S. POW/MIA personnel.

DOD policy is to support legitimate private initiatives that advocate humane treatment and release of captured American servicemen, as well as enemy compliance with the Geneva Conventions of 1949.

According to a recent DOD policy statement, "Commanders are authorized to assist such efforts, including those of POW/MIA family groups, provided the assistance is within the bounds of existing directives. Petitions on the POW/MIA issue may be circulated on military installations, if deemed appropriate, by the installation commander."

Military personnel are advised that there are no prohibitions regarding their expression of opinion on this subject to a foreign government. The individual serviceman may use his rank or title but "should restrict the content of (his) letter to the humane treatment and release of POW's by the enemy, and compliance with other provisions of the Geneva Conventions of 1949, and avoid political comment."

Indications are that among the various petitions in circulation in the behalf of U.S. POW/MIA's, there are what purport to be petitions in the Vietnamese language. Some of these translations have been checked by competent authority and are accurate translations of English letter text. However, others have been found to contain insulting words and phrases and obscenities.

In view of these facts, service personnel who plan to sign a letter or petition are urged to sign English lan-

guage texts only. Vietnamese translations should be signed only if the signer has personal knowledge that the translation is appropriate and would not destroy any value that the letter might have as an expression of concern.

## A Foamy Ending

DA NANG, RVN — A crowd had formed awaiting the arrival of two A-4E *Skyhawks* from Marine Attack Squadron 311. The crash crew was ready with the foam and water. The aircraft touched down safely and shut down. The pilots emerged from their aircraft and were promptly soaked with foam.

What happened? First Lieutenants James Wells and Jack Reed had just completed the squadron's 44,000th combat mission.

VMA-311 has been in the Republic of Vietnam since June 1965 and with the completion of this mission claims the combat mission record for Marine fixed wing squadrons.

## Record Course Completion

MEMPHIS, Tenn. — ATAN Ronald A. Webster completed the 20-week Avionics Technician School at NATC Memphis in a record two days.

Webster, who recently entered OCS, reported to the training center in January to begin classes. After attending the course's indoctrination class he asked for, and received, permission to accelerate the course.

A short review of the study materials normally distributed during the course's entirety was all Webster needed to prepare for the final exam. He achieved a final exam grade of 80, and was graduated from the school two days after he reported.

According to Webster, a technical electronics course in high school,

taught by a former Navy electrical engineer, contributed to his knowledge of Navy electronics. An electrical engineering degree from the University of Vermont also aided his progress.

## Buddy Bombing

DA NANG, RVN — Weather conditions are no longer as important a factor during bombing missions as they once were — not with A-6A pilots of VMA(AW)-225 around. The *Vikings* have given an all-weather, pin-point bombing capability to virtually all jets.

This remarkable feat is accomplished by what has been tagged "buddy bombing," a system which permits pilots to carry out bombing missions during weather conditions that would normally keep an F-4 or an A-4 on the ground.

"The aircraft are being used now just as the giant bombers were in WW II," explains Captain Nellis C. Dye, the squadron's assistant operations officer.

*Intruders* of the squadron are sent aloft with an escort, usually consisting of one *Skyhawk* and one *Phantom* which would normally be grounded in bad weather. When the A-6A radar intercepts a signal from a forward air controller in the field, the designated target area is pinpointed by the *Intruder's* computer and the information relayed to the escort planes.

When the A-6A reaches the drop point, the pilot signals the other aircraft, which are flying on the *Intruder's* wing tips, and all bombs are dropped on target. As the escort heads for home, the A-6A moves to another target. Although its bombs have been dropped, it can still mark targets for other planes.

The fuel capacity of an *Intruder* provides for an unusually long airborne capability, even without aerial refueling.

Prior to the introduction of the buddy bombing system, once an A-6A had expended its ordnance it was, for all practical purposes, "through" — even through the aircraft's delivery system was fully operational and plenty of fuel remained in its tanks.

Under the buddy system, it continues to function as a guidance system for ordnance released by almost any other jet: in addition to its aerial refueling capability, the *Intruder* has a form of "aerial re-arming," allowing for expanded flexibility and increased effectiveness.



## Accident Free

By Cpl. Sergio Ortiz

**M**arine All-Weather Attack Squadron 225 has flown more than 10,000 accident-free hours — compiling them while flying combat support missions for Allied forces in the Republic of Vietnam.

The squadron, commanded by Lieutenant Colonel John A. Manzione, Jr., flies the highly sophisticated A-6A *Intruder*. Currently serving with the 1st Marine Aircraft Wing, the squadron acquired its all-weather capability in 1966.

VMA(AW)-225 was one of the first Marine squadrons to participate in the Vietnam war, landing at Chu Lai in September 1964. The *Vikings* left SEAsia the following year and returned to combat in January 1969, dropping more than 44,000 tons of ordnance under all weather conditions since that time.

Manned by 44 officers and 253 enlisted Marines, the squadron recently received the 1st MAW's Efficiency Trophy.

In the accompanying photos, 1st Lt. W. H. Hansen preflights the intricate gears of an A-6A; an *Intruder* takes off from Da Nang; and Sgt. D. E. Wyatt adjusts the attachment on a bomb aboard a squadron plane.





**D**rive down Highway 101 south from San Francisco and, just past Palo Alto, you will catch the first glimpse of a prominent Bay Area landmark that is difficult to miss: a gigantic galvanized steel hangar measuring 1,138 feet long and 308 feet wide, rising 198 feet above the concrete.

Hangar 1 is located at NAS Moffett Field, an air station literally created by the resolute determination of local residents.

During the Twenties, the Navy

realized that it needed a West Coast airship base comparable to the one at Lakehurst, N.J., and the citizens of Santa Clara County, in competition with other West Coast areas, raised nearly \$480 thousand and purchased 1,000 acres near Sunnyvale on August 3, 1931. The land was presented to the Navy for the sum of one dollar. The Bay Area was about to receive its first naval air station.

During the following two years, 40 buildings were constructed, one of

which was Hangar 1, destined to become the home of the dirigible USS *Macon*. Finally on April 12, 1933, a crowd of 3,000 assembled for the commissioning of Naval Air Station, Sunnyvale. Admiral C. W. Laws, Commandant of the 12th Naval District, addressed the assembly: "As we prepare for the homecoming of the [airship] *Macon*, our thoughts turn to that other air base at Lakehurst, now vacant. I am sure you are grieving with me for the loss of the airship [USS

# MOFFETT FIELD

*USS Macon (ZRS-5) leaves Hangar 1 in October 1933 for her first flight after her arrival at NAS Sunnyvale, Calif.*



*Akron* had crashed just eight days before on April 4, 1933] but more particularly for the loss of Admiral Moffett and his crew who went down with their ship." The watch was set.

Two months after commissioning, the station air field was dedicated in honor of Admiral William A. Moffett. In October, *Macon*, sister ship of the ill-fated *Akron*, arrived at Moffett and began operations.

One year and four months, and 50 flights after her arrival on the West Coast, tragedy struck *Macon* — she was lost in a squall off Point Sur, Calif., along with two of her 100-man crew. That night, the beacon light atop Hangar 1 was switched on for the last time: there would be no more rigid airships for that light to guide, for neither the station nor the Navy.

With the loss of *Macon*, the station's *raison d'être* no longer existed and NAS Sunnyvale was placed in maintenance status. In September 1935, the Navy transferred the air station to the Army, and Moffett Field became that service's West Coast Air Corps Training Center and Basic Flying School.

The station remained under Army control until August 1941 when it was transferred back to the Navy. On April 16, 1942, NAS Sunnyvale was recommissioned and four days later was renamed NAS Moffett Field.

With the outbreak of WW II, it was felt that airships would be effective in ASW work along the West Coast, and Moffett was tapped to provide airship training, assembly and repair. Four L-type blimps were assembled at the field, and two hangars, each measuring 1,003 by 296½ by 178 feet, were con-

### By Michael G. McDonell

structed to house them. In addition to lighter-than-air training, Moffett Field also provided heavier-than-air services, training pilots in formation flying prior to combat deployment in the Pacific.

Following the war, the volume of training and operation naturally dropped off, but the reduction was partially offset by the Military Air Transport Service's (MATS) use of the station as a command, maintenance and training facility. Three Navy transport squadrons within MATS made the field their home base. To accommodate the MATS operations, modifications were made to the runways and the hangars.

On December 4, 1950, Moffett Field entered the jet era when the F3D *Skyknight*, the first U.S. jet night fighter, flew over the surrounding orchards and touched down at the field to begin squadron operations. But the jets remained for only a decade: the surrounding orchards and rural areas were rapidly becoming suburban and densely populated.

In July 1961, the jets departed for more sparsely populated areas and Moffett became the West Coast center for the Navy's propeller squadrons — the *Spads* of the attack squadrons and the multi-engined VR types had the station to themselves, but not for long.

In January 1963, when the P-3 *Orion* was introduced as the latest in flying ASW weapons systems, VP-31 Detachment Moffett was established. The detachment was assigned the mission of training pilots and crews for the

West Coast's new *Orion* squadrons.

This trend towards greater emphasis on ASW at Moffett was further manifested on January 1, 1964, when Commander Fleet Air Wings, Pacific, was commissioned at Moffett, and the new command assumed responsibility for all land-based patrol squadrons in the Pacific.

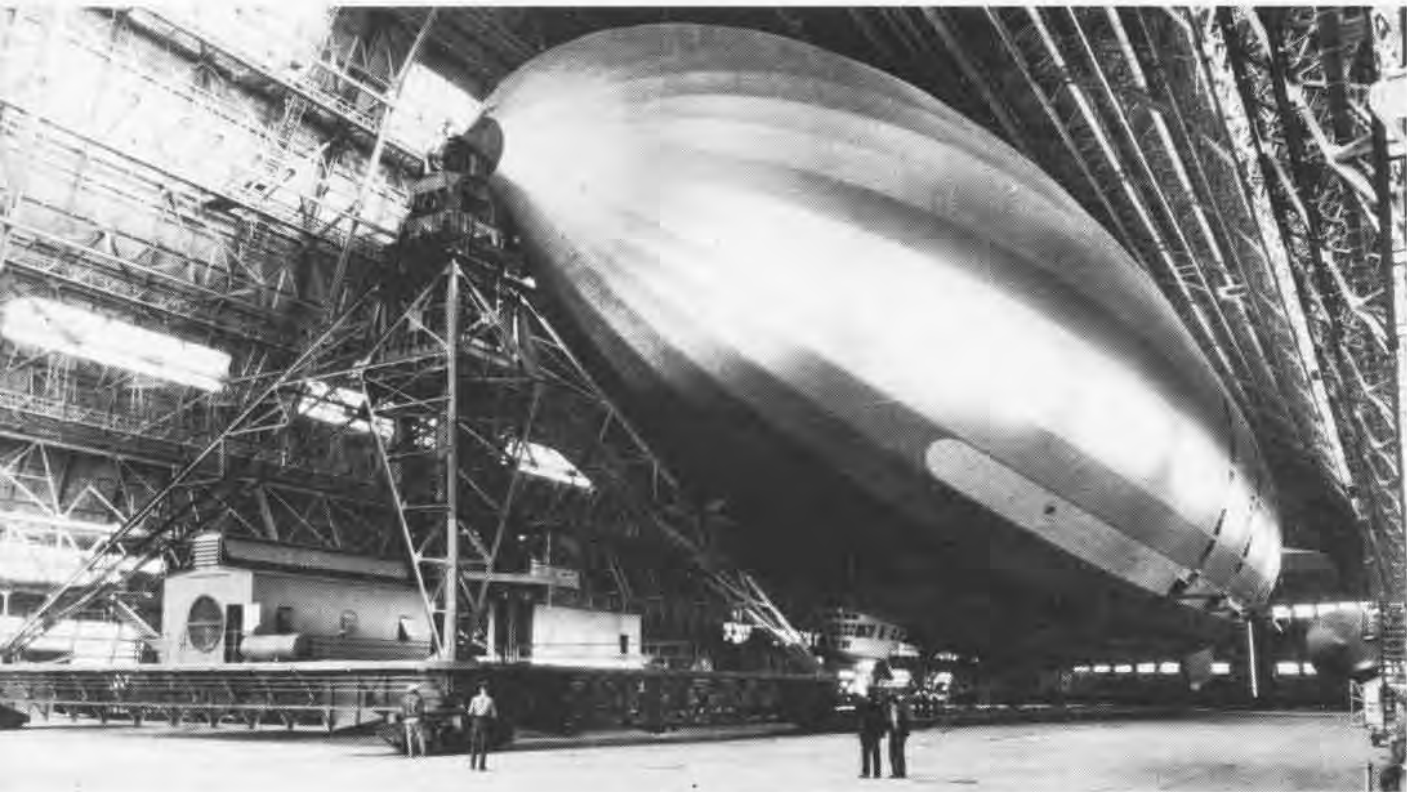
In April 1965, Fleet Air Wing Ten, which had been established at Moffett in 1963, deployed to the Western Pacific, leaving behind only a small administrative detachment. To fill the gap caused by the deployment, Fleet Air Wing Eight was commissioned in July 1965. (The two wings relieve each other every six months so that one remains at Moffett while the other deploys to WestPac.)

That same July saw the Commander Fleet Air Wings, Pacific, don another hat when he assumed responsibility for the operation of the station as Commander, Fleet Air Moffett. In September 1967, the command received a third hat — Commander Patrol Force, Pacific.

Since the end of WW II, Moffett had been home base for a variety of transport aircraft and units. But in early 1967, Moffett's transport phase ended. The Navy decided to withdraw its personnel from the Military Airlift Command, resulting in the decommissioning of three MAC squadrons and the wing headquarters which had been based at Moffett.

Today, NAS Moffett Field is the master patrol plane base for the Pacific. Presently based aboard are nine patrol squadrons — 9, 19, 31 (which replaced its Detachment Moffett in January 1967), 40, 46, 47, 48, 50

# ... a long way from *Macon*



and 91. Of the nine, seven make regular Pacific deployments. VP-31 serves as a training squadron, and VP-91 is a unit of the Selected Air Reserve.

With so many *Orion* squadrons aboard, the demands on the station's supply and maintenance departments are great, yet they are met. The Supply Department, with an inventory of more than 24,000 items, processes an average of 9,500 stock demands monthly, 82 percent furnished from available stock. Supply also provides the more than 30 million gallons of JP fuel that are consumed yearly by both the station *Orions* and transit aircraft.

As the Pacific area's prime aircraft intermediate maintenance department for the P-3, Moffett's AMD averages a total of more than 8,000 items processed per month. Its repair capability has been extended beyond the normal AMD level to include many functions that were formerly accomplished at the naval air rework facility level.

The *Orion* training site for the Pacific, Moffett transitions more than 2,200 officers and men yearly, often including crews from foreign nations.

The training units at Moffett include the combat air crew replacement squadron, VP-31; Fleet Airborne Elec-

tronics Training Unit, Pacific, Detachment Moffett; and Naval Air Maintenance Training Detachment 1012. Patrol Squadron 91 and Commander, Fleet Air Reserve Wings, Pacific, were recently established as part of the reorganization of the Selected Air Reserve.

As a bastion of defense against potential enemy submarine activity, Moffett's squadrons patrol the Pacific, sending operations information back to home base. As the potential underseas threat continues to build, the vital role and strategic location of Moffett Field will assume ever greater importance in the future of ASW operations.

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*...an air station literally created by  
the resolute determination of local residents.*

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NAS Moffett Field is named for Rear Admiral William Adger Moffett, the "Father of the Bureau of Aeronautics" and the architect of much of present day Naval Aviation.

Admiral Moffett was born in Charleston, S.C., on October 31, 1869. A graduate of the Naval Academy, Class of 1890, Moffett had served on six ships by 1896, when he began a five-month course at the War College. After completing the course, he joined the Nautical School Ship *Enterprise* and served with her for two years. He later served aboard the protected cruiser *Charleston* during the Spanish-American War, participating in the Battle of Manila Bay with Admiral Dewey.

After several years of sea duty, in 1906 he was ordered to the monitor USS *Amphitrite* and became that ship's executive officer. One year later, Admiral Moffett assumed command of Naval Station, Guantanamo Bay, Cuba. Following that assignment, he reported for instruction in the Compass Office, Navy Department, Washington, D.C., and, following the completion of the course, served with the Bureau of Equipment until March 1908.

A period of continuous sea duty followed which led to his assumption of command of the scout cruiser USS *Chester*. While in command of *Chester*, he participated in the Battle of Vera Cruz and, for his heroic action and skill in ship handling, was awarded the Medal of Honor.

In September 1914, he became Commandant, Naval Training Station, Great Lakes, Ill. Under his direction, Great Lakes expanded from a small station to the largest recruit training depot in the United States. Moffett then commanded the battleship *Mississippi* for two years before returning to Washington, D.C., for duty as Director of Naval Aviation, in March 1921. Four months later, he became the first chief of the newly created Bureau of Aeronautics and began the first of three four-year terms.

During Moffett's tenure, the concept of Navy sea and air power was realized; the carriers *Langley*, *Saratoga* and *Lexington* joined the fleet; aircraft catapults were installed aboard battleships and cruisers; air fields were commissioned throughout the country; aircraft evolved from biplanes to monoplanes; and the air-cooled engine was developed — a major aeronautical breakthrough.

Recognized as the paramount naval authority on aircraft, RAdm. Moffett was a qualified naval observer and an advocate of lighter-than-air.

The Admiral was killed in the crash of USS *Akron* on April 4, 1933.



Macon lies tethered to a self-propelled railway mooring mast inside Hangar 1, left. An Orion returns to the Bay Area after a 12-hour patrol, top. A Moffett tactical crew sharpens its skills, right. Above, balloon training, circa 1944, and, below, a pilot's-eye view of NAS Moffett Field.



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# Letters

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## Space and the United States Navy

I have just received by air mail (I subscribe by air mail to *NANews* and have done so for two years — it is certainly worth it) the *Space and the United States Navy* issue. This is a terrific job and, with all the color plates, is indeed a collector's item. I certainly congratulate you and your fine staff for this splendid effort which I hope will be a prize winner for layout and presentation. You have apparently covered all of the astronauts associated with, and part of, the Navy, no mean feat so far as photo coverage is concerned.

T. F. Gates  
25 Sunset Drive  
Berkeley, Calif. 94707

Just a note to tell you how much I enjoyed *Space and the United States Navy*. It really was extremely well done and it is too bad that it doesn't get wider distribution.

Adm. Arthur W. Radford, USN (Ret.)  
Washington, D.C. 20024

I have just completed perusing *Space and the United States Navy*. It is indeed a delightful, informal study, and I have informed our office staff about it. Thanks for the copy.

Max Rosenberg  
Deputy Chief Historian  
Office of Air Force History  
Hq., USAF, Washington, D.C. 20314

Congratulations to you from all of us at the Naval Institute for a superb publication.

David Q. Scott  
Executive Director  
United States Naval Institute  
Annapolis, Md. 21402

Two things have transpired which make the writing of this letter a must: *Space and the United States Navy* and the December 1970 issue of *Naval Aviation News*. Both are remarkable publications and I congratulate you.

I know that the research necessary for their preparation was a tremendous under-

taking. I like to think that some of the historical material I compiled and filed in the archives, back in the early 20's when BuAero was authorized, might have served some purpose. I cannot describe adequately the great pleasure I have had in reading the names of the persons I knew personally in aviation, and in reliving the events with which they were associated. It is difficult to realize that so many years have passed since the airplane was born. It is even more difficult to realize that the ensuing progress has all been in my lifetime; that I met Wilbur Wright in the early days of Naval Aviation when I joined the Bureau of Aeronautics and set up the personnel files through which I came to know every Naval Aviator — Spuds Ellyson, Jack Towers, Pat Bellinger, Putty Read, Chevy Chevalier, Rum Mustin, Ken Whiting, Pete Mitscher . . . later followed by the youngsters of WW I, Gates, Lovett, Gould and Ingalls; then the post-WW I pilots, who all came after the "first 100 Naval Aviators"; each group bearing the tragedies and the heartbreaks of experimentation, as well as the joys of successful



*For most of us, Naval Aviator wings did not come easily, but for Robert Carlquist, 8-month-old son of Captain and Mrs. Roger Carlquist, it was no problem at all. While being held by his mother, the youngster removed the miniature gold wings from his mother's blouse, popped them into his mouth and swallowed them. Mrs. Carlquist did not notice their absence until sometime later and, despite young Robert's serene countenance, immediately assumed the worst. His parents rushed him to the dispensary where this X-ray was taken. Luck was with Robert. The pin was closed and the wings "passed on" naturally. While this is presumed to be a record of sorts, we recommend that it stand unchallenged.*

accomplishments. These I shared and recorded as head of the editorial research section of the Bureau. Through *Space and the U.S. Navy* and the December *Naval Aviation News* you have vividly recalled it all for me.

In my opinion a 4.0 definitely indicated for both publications. Thank you for all the effort put forth to make possible such outstanding editions.

Captain Joy Bright Hancock, USN (Ret.)  
214 Crest Road  
Cape May Court House, N.J. 08210

## Ellyson Anniversary

NAS Ellyson Field, home of the Navy's only helicopter training squadron, will celebrate the 30th anniversary of its commissioning May 25-29.

All original commissioning personnel, as well as any past Ellysonites, are urged to attend. Reservations and further information may be obtained by writing to:

Ellyson Field Reunion  
P.O. Box 3222  
Pensacola, Fla. 32506

## 1,000 Landings

I logged my 1,000th carrier arrested landing as I trapped aboard USS *John F. Kennedy* (CVA-67) on October 24, 1969. I was Commander, Attack Carrier Air Wing One and *Kennedy* was operating in the Mediterranean.

The event was duly noted on page 29 in the January 1970 *Naval Aviation News* which reported that I was number six in this accomplishment. Since that time I have noted that at least two additional Naval Aviators passed that particular milestone, with each laying claim to being number six. The latest claim is on page 5 of the December 1970 issue.

With the increased numbers of landings being logged by Naval Aviators in recent years, there will be more and more reaching the 1,000 mark and more confusion as to who is number what. In fact, I imagine that before many years pass, 1,500 will be the big accomplishment. Until that time, though, may I recommend that *NANews* accept the challenge of keeping an account of the numerical sequence of those who pass the 1,000 carrier arrested landing point.

Captain William G. Sizemore  
Staff, ComFAirJax  
Box 24  
NAS Jacksonville, Fla. 32212

**«We really dropped the (meat) ball on this one. We think it is time to quit counting but will continue to report the event as an outstanding accomplishment.**



Claiming to be the oldest continuously operating patrol squadron in the Navy, VP-46 is in its fifth decade and still continues the squadron mission: sub hunting. Led by Commander R. M. Burris, the Gray Knights are based at NAS Moffett Field, California.



# 170 YEARS OF NAVAL SERVICE



NAVAL AVIATION

**NEWS**

These coats, representing 170 years of naval service belong to a Naval Air Force, Atlantic, aircraft maintenance team. Teams such as this visit East Coast air stations, and ships and squadrons deployed to the Med and Gitmo. During an average three-day visit, the team assists in the standardization of maintenance-management policies and procedures.