NAVAL AVIATION NEWS

FEBRUARY 1974


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NAVAL AVIATION NEWS

FIFTY-SIXTH YEAR OF PUBLICATION

THE STAFF

COVERS — *PH2 Terry C. Mitchell, CCGLant, took the front cover photo of the F-14 aboard USS Forrestal for carrier suitability tests. On these pages, a Skyhawk of VAQ-33 can be seen from the cockpit of another squadron A-4. Back cover photo of USS Guadalcanal's CH-47 making the LPH's 60,000th landing was taken by PH2 Rick Boyle.*

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EDITOR'S CORNER

The other day we had the good fortune, along with a small group of aviation buffs, to see some vintage aircraft on display at a storage area for the Smithsonian Institution's National Air and Space Museum in Silver Hill, Md., a suburb of the nation's capital.

It was stimulating to take a fresh look at the venerable flying machines and marvel again at the evolution of aircraft over the past 70 years of the air age.

At one point our escort, Mr. Donald Merchant, Chief of Preservation, Restoration and Storage of the museum, singled out a relic of which he seemed particularly proud. "This model should interest you as much as any other," he said. He motioned toward what, at a cursory glance, seemed no more than a feeble collection of wire, wood and faded fabric shaped into the form of an aircraft. "Built in 1909,

by Curtiss," he asserted. "Take a look at the pilot's seat."

Situated well forward of the wings, the seat looked like a simple chair in the fragile stage of being upholstered. Connected to the wooden bottom was the body support frame which consisted of wire cords molded into a single unit. It could have been built with shirt hangers. Directly in front of the seat rose the control stick capped by a pretentious steering wheel.

"The stick controlled the elevators," Mr. Merchant related, "by the normal back and forth pressure on the wheel. But to turn," he went on, "the pilot did not, as you might suspect, rotate the wheel." He then pulled downward on the support frame which slanted, in its entirety, toward him. "He leaned in the direction he wanted to go!"

He explained how the intricate system of pulleys and cables which connected the ailerons with the seat frame functioned. He pointed out the braking technique which called for the pilot to lean forward and pull aft on a steel bar which consequently contacted the nose tire and brought the ship to a stop by the friction principle.

There was a huge post-WW I, coast-to-coast transport flown by Army pilots. It was equipped with dual steering columns, one forward in the cockpit and another enclosed near amidships. Either pilot could fly the aircraft even though they couldn't see each other.

Along one wall lay the enormous, partially dismantled fuselage of the Enola Gay. One can see, at close hand, the bomb bay which cradled the atomic device dropped at Hiroshima. It was unsettling to envision that huge weapon in the B-29 and recall how the combination of man, aircraft and bomb drastically altered the course of history.

Then there was the incredible single engine plane which was flown for more than a month without landing. In the first third of the twentieth century, its adventuresome pilots completed an unparalleled demonstration of the feasibility of in-flight refueling and replenishment. How was the plane serviced in addition to refueling? One pilot would fly it while his partner clambered onto the wing with the necessary tools and, employing enviable dexterity, serviced the engine.

There was the intriguing yet diminutive German rocket plane, the likes of which effectively harassed Allied bomber groups during attacks on the European mainland in WW II. The pilots of these bullet-like affairs with small wings and tight cockpits would streak quickly to altitude, then swoop down on their slower prey for the assault.

In this month's issue, which features a summary of major events in Naval Aviation for 1973, the S-3 and F-14 represent new highs in aeronautical achievement. It is somewhat staggering to ponder the scope of development in the seven comparatively short decades which have seen a Curtiss biplane evolve into a Tomcat or a Viking. Although most of us breathing today won't be around 70 years from now, it is interesting to imagine what airplanes and the people behind them will be like, say, in the year 2050.

did you know?

Arleigh Burke Fleet Trophy

Attack Squadron 153, presently deployed aboard USS *Oriskany*, has been named the recipient of the Arleigh Burke Fleet Trophy for achieving the greatest improvement in battle efficiency during FY 73. The trophy, named for former Chief of Naval Operations Admiral Arleigh A. Burke, is awarded annually to a ship or squadron in both the Atlantic and Pacific Fleets. This is the first year the trophy has been awarded to a carrier-based squadron.

CVT-16

In November the Navy's training aircraft carrier, USS *Lexington* (CVT-16), pulled into the Alabama Dry Dock and Shipbuilding Company, Mobile, Ala., to begin almost five months of repairs. In addition to work on the major propulsion unit, many habitability improvements are being made, including the installation of central air conditioning.

Before she went into Mobile, she recorded her 329,000th arrested landing. Because of her assignment as the Air Training Command's carrier, qualifying basic and advanced flight students for carrier landings and conducting refresher qualifications for fleet pilots, *Lady Lex* averages 4,100 arrested landings a month, with as many as 500 in a single day.

Lexington, who will celebrate her 30th birthday on February 27, is commanded by Captain Jack E. Davis.

Marine Reserves Get F-4B

Marine Fighter Squadron 321, NAF Washington, D.C., in December became the first Marine Corps reserve squadron to receive the F-4B *Phantom*. Captain J. R. Foster ferried the first F-4B to the squadron from NAS Oceana, Va.

Naval Aviation Museum

While building progress on the Naval Aviation Museum at NAS Pensacola has been slow, in December a shipment of necessary steel arrived and now the contractor plans to complete the building in time for a fall opening in 1974. The new section will have six times the display area of the 8,500-square-foot temporary building.

The new building is designed around the famous NC-4 which made the historic 1919 transatlantic flight under the command of LCdr. Albert C. Read. The restored NC-4 will be trucked to Pensacola from the Smithsonian Institution and displayed with over 20 other historical aircraft. Several larger planes will be displayed outside. (The museum currently boasts 49 historical Navy aircraft.)

A tribute to Naval Aviation POWs of the Vietnam conflict is now on display and negotiations are under way to include the *Skylab II* command module, which had an all-Navy crew, and Eugene Cernan's *Apollo X* spacesuit in a space display.

Deep Freeze

Two of the three new aircraft scheduled for use by Antarctic Development Squadron Six are now actively engaged in extensive operations in Antarctica. The new planes are similar to the special ski-equipped LC-130 used by the Navy in Antarctica since 1960. The National Science Foundation turned the new C-130s over to VXE-6 late last year. VXE-6, home-ported at NAS Point Mugu, Calif., is the primary logistic aviation unit responsible for flying men, equipment and supplies in support of the international scientific research program in Antarctica.

did you know?

Over-the-Horizon Weather

The Naval Research Laboratory, Washington, D.C., has announced the development of an unusual radar technique of significant value in obtaining quick and accurate observations of weather at sea. A team of radar scientists has been able to collect ocean weather data from 400 to 3,000 nautical miles, over a major portion of the North Atlantic, from its bay-shore site at Chesapeake Beach, Md.

Captain John T. Geary, Director of NRL, notes that the importance of the over-the-horizon radar observation (*Madre*) is the fact that a major portion of the North Atlantic can be surveyed in as little as half an hour and, essentially, on demand. *Madre* can be used to determine sea state and direction and strength of surface winds. Environmental conditions which have already been observed range from calm seas to hurricanes. *Madre* observations could be used by commercial and military elements to warn ships and aircraft of brewing storms at sea. Navigation routes along sea lanes and airways could then be altered to avoid the hazardous areas detected. Long-range and daily forecasts could also be expeditiously computed.

Madre is considerably different from conventional microwave radar commonly employed to detect aircraft and ships. Operating in the high frequency portion of the electromagnetic spectrum, a typical operating frequency may be 15 megahertz, nearly two orders of magnitude lower than radars used in the air traffic control system. *Madre's* antenna is roughly 300 feet long and 150 feet high. Average transmitted power is in the order of a few hundred kilowatts.

Madre radar waves are refracted by the ionosphere, 100 miles above earth. After refraction, the waves return to earth in the 400 to 3,000-nautical-mile pattern and illuminate a "sea patch." Some of this energy is scattered back from the ionosphere to the radar which receives and measures it. Distances in excess of 2,000 miles are obtained via multiple refractions from the ionosphere, overcoming the limitation of line-of-sight radar.

The remote weather-sensing capability of *Madre* is based on measurement of the characteristics of the radio energy reflected from a series of patches of ocean surface. The characteristics of the signal are determined by a degree of sea surface roughness within a patch. The degree of roughness has been shown by oceanographers to be related to the wind speed and direction in the area. Hence, both sea roughness and wind characteristics can be determined from a single radar measurement.

Additional experiments are in the planning stage. A new radar will be used to cover the North Pacific. In cooperation with other units of the Department of Commerce, NRL plans to jointly operate over-the-horizon weather radar at San Clemente Island directed toward the Gulf of Alaska.

Harpoon

The antiship missile *Harpoon* scored a hit on a moving patrol boat target in November during a test launch from a P-3 *Orion* at Point Mugu, Calif. The launching was the first of a new series of test firings conducted since *Harpoon* passed its design feasibility test last June. McDonnell Douglas is currently building 40 *Harpoon* prototypes for the final development phase, during which the full launch platform capabilities of the missile will be demonstrated. Test launchings will continue from surface ships, submarines

and aircraft. Tests will also include firings from a canister launcher aboard the Navy's new hydrofoil patrol boats.

Wind Shear

An echo-sounding device capable of measuring wind shear (abrupt changes in horizontal wind speed and direction with height) has been installed at Stapleton International Airport, Denver, Colo., by scientists from the National Oceanic and Atmospheric Administration. Wind shear contributes to many landing accidents, and many less serious incidents, because the change in wind velocity can interfere with the rate of ascent or descent during critical phases of takeoffs and landings.

Developed by an NOAA environmental research laboratory under an FAA-funded project, the acoustic wind shear sensor measures wind motion at 30-meter intervals from heights of a few meters to half a kilometer.

The measurements are obtained by beaming a pulse of sound vertically into the atmosphere from a speaker installed near the end of a runway, then measuring the Doppler effect produced by wind motion. By "listening" for the scattered echoes returned from turbulence (which mark areas of wind shear), the Doppler-shifted frequency can be detected and translated into wind speeds across a vertical section up to about 1,600 feet. This information is then automatically displayed in the control tower as the altitude of maximum wind shear and wind strength and direction at that level. When wind shear reaches a critical point, air traffic controllers at Stapleton will relay the data to pilots.

If the prototype system performs well, it will be developed for further testing and may become part of the instrumentation used by major airports.

A Choice

Last November, members of the Naval Academy Class of 1974 completed cards indicating choices of duty following graduation. The priority assigned an individual's preference is based on a number of factors, including class standing, needs of the Navy and personal qualifications. Of the approximate 900 June graduates, 425 selected Naval Aviation as their first choice of duty.

GRAMPAW PETTIBONE

Most Preventable

The lieutenant Naval Aviator manned his A-7E *Corsair* for a night practice carrier landing period. Following an uneventful preflight, start, taxi and takeoff, he proceeded to the outlying field where the period was to be conducted.

Upon entering the pattern, he commenced his approaches. The first seven were normal; on the eighth, in addition to the standard ball call, the pilot added the words "bingo pass." This comment, though confirmed by other aircraft in the pattern, was not heard by any of the four LSOs.

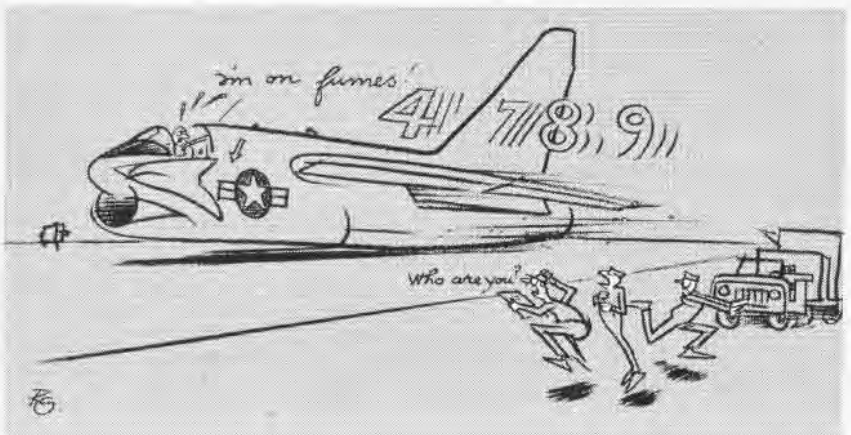
The *Corsair* continued its approach to touchdown. Leveling on the downwind leg following this approach, the pilot raised his gear and then his flaps. At a position slightly past the normal 180-degree position, he transmitted his intention to depart the pattern for home plate. Shortly thereafter, he was instructed by the LSO to remain in the pattern.

Following retransition to landing configuration, he flew his ninth approach to touchdown. Believing his session at the field to be over, he retracted his landing gear but left his flaps down. He then asked the LSO for his total number of approaches.

At this point, the pilot states he was instructed to remain in the pattern for one more approach. Concerned about his low fuel caution light, he made a transmission concerning low fuel. Asked by the LSO, he stated he had 1,350 pounds remaining. The LSO replied that he was now cleared to depart for home base and received an acknowledgement.

The pilot, misunderstanding or not hearing his clearance to depart, continued from the 180-degree position for another approach, configured with flaps down and landing gear up. He called the ball and received a late Roger. In close, he was asked his side number, which he gave. At this time, the LSOs believed he had already departed for home plate. Confusion as to who was on the ball prompted the confirmation call by the LSO. By the time they discovered that the *Corsair* was, in fact, making another approach, the pilot had arrived at ramp position. No one discovered positively that the aircraft had no gear until it passed the waveoff point.

The pilot continued the approach and subsequently touched down with his landing gear up. He initiated ejection shortly after touchdown and landed uninjured on the runway. The aircraft continued to slide, departing the runway from the right side, and became airborne again approximately 3,000 feet from initial impact. It flew, on fire, an additional three nautical miles, finally impacting an uninhabited wooded area three miles northeast.



Grampaw Pettibone says:

Great balls of fire! I'm really torn up over this — again! No matter how many times we preach that a "break in habit pattern" is a setup for a checklist omission, some aviators obviously don't believe it until it's too late.

When we sit around and shoot the breeze about "rollers up" landings or passes, the consensus is that there are those who have made wheels-up landings or passes and those who are lucky. *Not so!* There are those who use checklists and those who don't. It's that simple.

ILLUSTRATED BY Osborn

Zero-Zero

The student naval flight officer and his instructor arrived at their assigned TF-9J *Cougar* to begin their preflight. The preflight was completed and the *Cougar* was found ready in all respects. This was to be the student's first flight in the TF-9J. The plane captain strapped the instructor in the front seat and then assisted the student. After he went through a seat check with the student and checked him out, the plane captain departed the wing and connected the external electrical power.

Shortly afterwards, the student developed problems with his ICS. The lineman summoned a technician and, after about 20 minutes, the problem was apparently solved.

After the instructor completed his cockpit check, he gave the student the signal to turn up. The turn-up was uneventful, the TF-9J taxied forward in order to avoid placing its jet blast on another aircraft. The chocks were inserted and the instructor went ahead with the operational preflight checks (speed brakes, flaps, etc.).

When everything was confirmed normal, the lineman gave the pilot and student the signals to pull their seat safety pins and do a canopy clearance check. At this time, the lineman noted that the student had his hands on the face curtain; the lineman yelled, waved his hands and tried to get him to stop.

Meanwhile, in the aircraft the instructor asked the student if he was clear of the canopy and the student said, "Roger." The pilot began to move the canopy forward and, in his mirror, saw that the student had his hands near the top of the seat. The pilot directed him to get his hands in the cockpit.

The student proceeded to pull the face curtain handle down over his face, and *the seat fired!* The instructor observed the student's chute open, followed immediately by the student landing on the ramp adjacent to the aircraft.

Grampaw Pettibone says:

Thunderin' thunderins! I can't believe this happened — what in the world was this student thinkin' of! If the instructor hadn't taken a second look after the student Rogered that he was clear of the canopy, this lad would'a been kilt — or seriously injured.

Most certainly, Naval Aviation doesn't need people riding shotgun who don't know what to do with their hands! In this case, zero-zero was for headwork coolness!

A Bit of Nostalgia

In these days, when nostalgia is becoming a part of our style of living, we thought it would be appropriate to reach back to some old, classic Gramps' tales from time to time. We hope you enjoy them again.

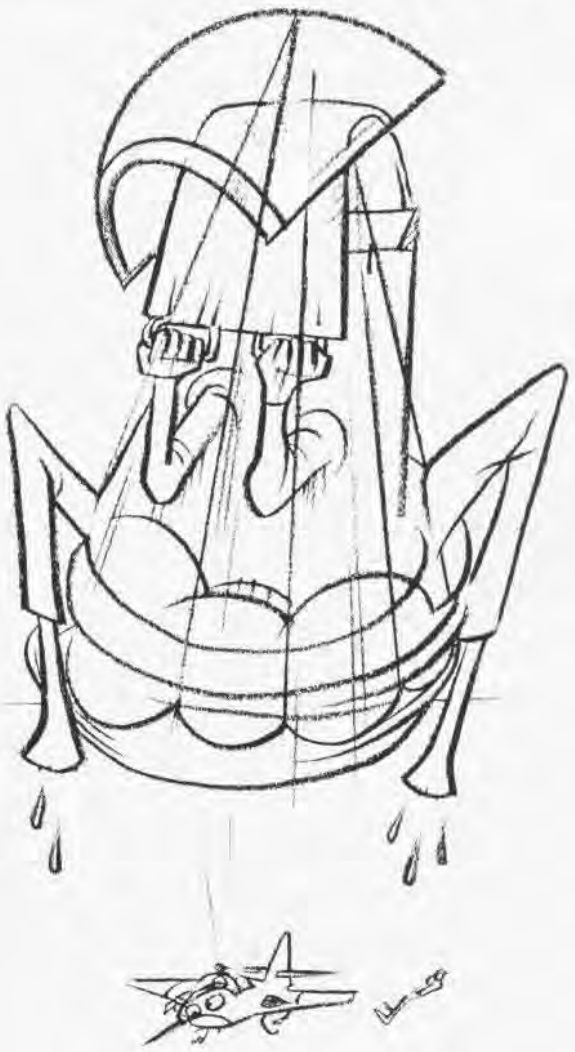
While coming in for a landing after a familiarization hop, a pilot's engine cut out completely at 650 feet. The aviator said that he immediately put on the electric fuel pump, switched to the "reserve" fuel tank and noted that the fuel gauge showed 45 gallons. However, the engine failed to catch again and the plane crashed in a small wooded area. The pilot received serious injuries.

Crash investigators found the fuel selector switch was on "main" despite the pilot's statement that he had switched to "reserve." The Trouble Board held that the pilot switched back to the main tank before the engine could establish suction again.

The board recommended that any pilot checking out in a new type of aircraft should be given either a written or an oral examination to ascertain that he was fully acquainted with all operating characteristics of that model. This board considered that the examination should stress especially the fuel system and engine operating data (February 1945).

Grampaw Pettibone says:

Any pilot who will take off in a new type plane before he is thoroughly familiar with every switch, lever, button, line and gadget doesn't rate his wings.



POWs return

Minesweeping

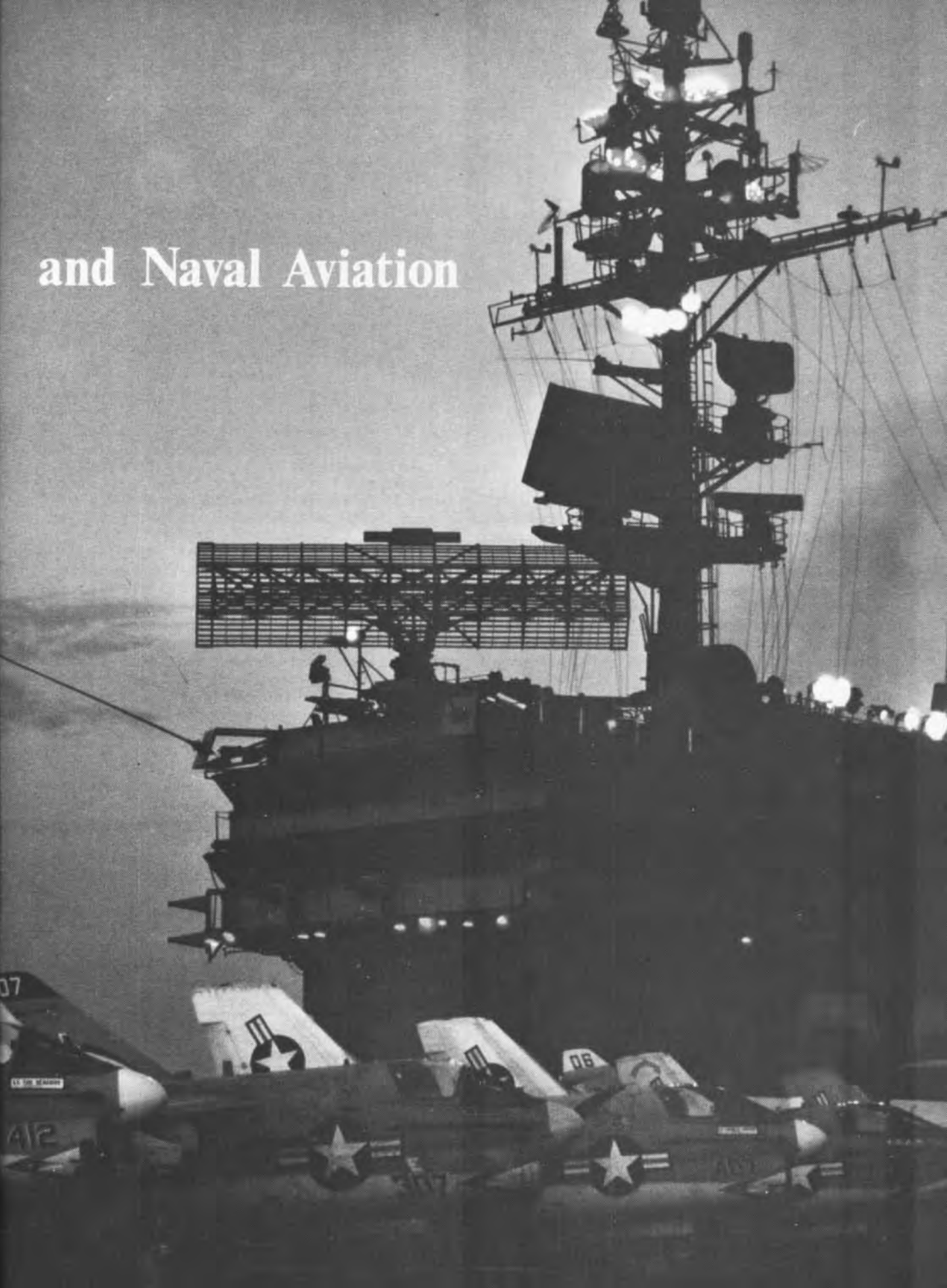
Joint exercises

Skylab recoveries

1973

By Naval Aviation Historians
Clarke Van Vleet
and Lee Pearson

CEASE FIRE


and Naval Aviation

1973 and Naval Aviation

January

1 — With the New Year, a major reorganization in naval reserve affairs got under way as a result of the announcement two days earlier by the Secretary of the Navy that the Naval Surface and Air Reserve Commands would be consolidated into a single command located in New Orleans.

3 — Supply routes and other targets in North Vietnam below the 20th parallel were attacked by U.S. planes.

6 — Le Duc Tho, the North Vietnamese negotiator at the private Paris peace talks, arrived for the resumption of negotiations scheduled for January 8; talks had broken off on December 13, 1972.

8 — Israeli planes struck Syrian targets in reprisal for Palestinian guerrilla attacks staged from Syria on the Israeli-occupied Golan Heights.

8 — Representatives of the Greek and U.S. navies signed an accord in Athens formally granting the U.S. Sixth Fleet home-port facilities in the Athens vicinity. The agreement, called a "technical arrangement," emphasized that the facilities were granted "in order to serve the purpose of the North Atlantic Alliance" and stated that the arrangement "does not contemplate the establishment of a naval operational base or a naval dockyard." Under the arrangement, one of the Sixth Fleet's two carrier task forces in the Mediterranean would be stationed in the Athens area.

9 — The Department of Defense reported that American planes were being permitted to operate in the North Vietnamese panhandle to pursue North Vietnamese jets that attempted to attack U.S. planes.

10 — The Navy announced that eight women had been chosen to take pilot training at Pensacola. At the end of their 18-month courses, they will be the first women pilots in the Navy. Federal law prohibits combat duty, although women ferried aircraft during WW II.

12 — Lieutenants Victor T. Kovaleski and James A. Wise of VF-161, flying off *Midway*, shot down a North Vietnamese MiG-21, the last enemy "kill" of the war, making a total of 54 enemy planes shot down by USN pilots during the Vietnam conflict.

15 — Following talks between National Security Advisor Henry Kissinger and President Nixon, White House Press Secretary Ronald Ziegler announced the suspension of all bombing, mining and shelling of North Vietnam because of progress made in the Paris peace talks.

16 — *Luna 21*, an unmanned Russian spacecraft, successfully landed on the moon and a remotely controlled roving moon vehicle, *Lunokhod*, began operations.

16 — Captain Chester M. Lee, USN (Ret.), was named program director of the U.S. effort in the U.S./U.S.S.R. joint manned space flight mission. Capt. Lee became responsible for the direction and management of the U.S. effort in the joint mission scheduled to be flown in July 1975, including the spacecraft and docking module coordination, flight and crew operations at the Manned Spacecraft Center, Houston, launch vehicle activities at the Marshall Space Flight Center, Huntsville, Ala., and launch operations at the Kennedy Space Center, Fla.

18 — The U.S. command reported an increased number of air strikes against enemy positions in South Vietnam.

19 — The Deputy Secretary of Defense directed that, as a step in the adjustment of test and evaluation facilities to meet defense needs through 1980, the three services should adopt uniform policies and procedures for funding.

23 — An agreement was formally signed in Paris providing for an internationally supervised cease-fire to take effect January 27 for the release within 60 days of all American prisoners and for the withdrawal of all U.S. troops from South Vietnam.

27 — DOD announced the end of the military draft.

27 — Task Force 78 was formed to conduct minesweeping operations in North Vietnamese waters under the code name Operation *Endsweep*. It consisted of surface minesweeping elements and an Air Mobile Mine Countermeasures Command. The latter was made up of HM-12, HMH-463 and HMM-165 organized into units Alpha through Delta, an airborne mine countermeasures planning, command and control element, an aircraft element and a material element.

27 — As the Vietnam cease-fire, announced four days earlier, came into effect and carriers on Yankee Station cancelled combat sorties, the Navy pilot with the most combat missions to his credit throughout the whole of the Vietnam conflict was reported to be Commander Denny Weichman, C.O. of VA-153, with 629 combat missions.

29 — The President's FY 74 budget to Congress called for an overall Navy personnel strength by June 30, 1973, of 574,000 and by June 30, 1974, of 566,000; Navy attack and Marine Corps wings to remain at 14 and three, respectively; and attack and antisubmarine carriers to be reduced to 16 by June 30, 1973, and to 15 by June 30, 1974.

February

1 — The U.S. Third Fleet was reactivated at Pearl Harbor with the merger of the First Fleet and Antisubmarine Warfare Forces, Pacific Fleet. The change was made to reduce fleet staffs and achieve economies while retaining control of operational units, including some 100 ships and 60,000 men serving a 50-million-square-mile area from the West Coast to beyond Midway Island. In WW II, the Third

American POWs waiting to be released at Gia Lam Airport, North Vietnam.

Fleet, under the command of Admiral William "Bull" Halsey, had battled its way across the Pacific to Tokyo Bay.

5 — The Defense Department announced that Navy demolition experts met with North Vietnamese leaders to discuss clearing the mines from the port of Haiphong.

6 — Naval Air Systems Command acquired 30 surplus M-41 *Walker Bulldog* light tanks from the Army for use as mobile land targets in air-to-surface missile practice. The QM-41 targets were to be used on Navy and Marine Corps bombing and gunnery ranges.

6 — In a decision which promises to greatly improve future avionics maintenance, the Naval Air Systems Command established a policy that new avionics equipment generally be designed for automatic trouble-shooting with general purpose VAST computerized testing equipment.

6 — Surface minesweepers of Task Force 78 began preliminary sweeping to prepare an anchorage in deep water off the approaches to Haiphong Harbor. Ships of the force included *New Orleans* (LPH-11), *Inchon* (LPH-12), *Ogden* (LPD-5), *Cleveland* (LPD-7), *Dubuque* (LPD-8), four surface minesweepers and other naval units. During the operation, they were joined by *Tripoli* (LPH-10).

12 — The first group of American prisoners of war to be released by Hanoi and the Vietcong arrived at Clark Air Base in the Philippines.

14 — The Pentagon announced a step-up of U.S. air strikes in Laos to 380 daily, an increase of 100.

15 — Israeli and Egyptian planes clashed over the Gulf of Suez, breaking a quiet of eight months in the area.

15 — In dedication ceremonies at Agana, Guam, the airfield at the naval air station was named in honor of Commander Charles Walter Brewer, a Naval Aviator who distinguished himself in the great carrier air battle near Guam prior to the island's recapture from the Japanese.

23 — Operation *Deep Freeze* ended its 18th consecutive year in Antarctica when the last flight of Antarctic Development Squadron Six left McMurdo Station for home.

27 — In the first aerial minesweeping sortie of Operation *Endsweep*, a CH-53 *Sea Stallion* from HM-12, piloted by Commander Jerry Hatcher, made two sweeps in the Haiphong shipping channel. All operations were abruptly stopped and the minesweeping task force moved to sea as the President called for "clarification . . . on a most urgent basis" of Hanoi's delay in releasing POWs.

28 — After the halt of minesweeping operations and the withdrawal of U.S. troops, Hanoi assured the U.S. that all POWs would be released within the stipulated 60-day period.

March

1 — Captain James A. Lovell, Jr., who had spent more time in space than any other human — nearly 30 days — retired from the Navy.

2 — At the close of a five-day international conference in Paris, the U.S., U.S.S.R., China and nine other parties signed a formal declaration pledging to respect the cease-fire in Vietnam.

3 — Turkish officials reported that in recent days Soviet warships, including the helicopter carrier *Moskva*, had left the Black Sea and entered the Mediterranean in numbers not seen since the 1967 Arab-Israeli war.

4 — The withdrawal of U.S. troops from Vietnam resumed; the naval minesweeping force returned to its position off

1973 and Naval Aviation

Haiphong and the harbor was reopened after being closed for ten months because of the U.S. naval mining which began in May 1972. In addition, the carrier USS *America* was ordered to depart the Far East for the U.S., the initial move in reducing from six to three by mid-June 1973 the number of carriers serving in the Vietnam area.

5 — Commander in Chief, Atlantic, Admiral Ralph W. Cousins, announced that his command would conduct a joint training exercise in the Camp Lejeune area of North Carolina during March and April. The exercise, *Exotic Dancer VI*, involved forces from the U.S. Army, Navy, Air Force, and Marine Corps; an estimated 42,000 participating and supporting troops were to be employed.

6 — The Naval Air Systems Command announced that by 1975 microfilm cartridges would replace paper manuals as the standard source of technical information for maintenance of aircraft and aeronautical equipment.

8 — The Navy announced a compromise settlement in its negotiations with Grumman Aerospace Corporation over the F-14 fighter program. The decision, in effect, limited the Navy purchase to a total of 134 aircraft at the previously agreed contract price and left open the purchase price of any additional planes, subject to Congressional approval.

12 — The second round of the Strategic Arms Limitation Talks (SALT) resumed in Geneva after a recess.

13 — In protest against a delay in releasing American prisoners, the U.S. again temporarily halted troop withdrawals from South Vietnam.

14 — American troop withdrawals resumed as 108 more American prisoners of war were released by Hanoi.

16 — The Chief of Naval Material established a Director of Naval Ranges to provide management coordination and direction, within the Naval Material Command, for the Pacific Missile Range, the Atlantic Fleet Weapons Range and the Atlantic Underseas Test and Evaluation Center.

17 — Earth's oldest man-made satellite marked its 15th anniversary in space. Designed and developed at the Naval Research Laboratory, the three-pound, grapefruit-sized *Vanguard I* was launched on St. Patrick's Day 1958 and had orbited the earth more than 58,000 times. Space experts estimate it may remain in orbit until about 2250 A.D.

19 — The Navy announced that the option for Lot IV of the S-3A *Viking* production contract was being exercised. This provided for the purchase of 35 additional S-3As and brought the total under contract to 56.

21 — VXN-8 returned to NAS Patuxent River, Maryland, from Project *Magnet* deployment to the Southern Hemisphere under the direction of the U.S. Naval Oceanographic Office. During the deployment, two flights were made around the world within the Southern Hemisphere, and an over-the-South-Pole flight by an RP-3D piloted by LCdr. J. H. Capley on March 4 was a first for that type aircraft.

29 — The remaining U.S. combat forces left South Vietnam as the last 148 POWs were released by Hanoi, bringing to a total of 566 the American prisoners returned to the U.S. since the cease-fire agreement. Of this number, 139 were naval pilots and aircrewmen with 134 still missing.

April

1 — The Secretary of Defense stated that the bombing of Cambodia was necessary for the survival of the anti-Communist government because of a massive threat by well-armed, well-organized guerrilla forces, which included forces from North Vietnam.

1 — Two new air wings were commissioned as the final phase of the reorganization of the AirLant community, completing the functional wing concept: Air Antisubmarine Wing One with VSs 22, 24, 27, 30, 31 and 32 and Helicopter Antisubmarine Wing One with HSs 1, 3, 5, 7 and 11.

5 — A supply convoy under American air cover sailed up the Mekong River in an attempt to penetrate a Communist encirclement of Phnom Penh, Cambodia.

9 — Eight out of an embattled 18-ship convoy penetrated the Communist blockade of Phnom Penh, bringing the city fuel for the first time in two weeks. The following day, the U.S. began an airlift to provide more fuel.

9 — The Secretary of the Navy announced that the Hughes Aircraft Company's Aerospace Group Systems Division, Canoga Park, Calif., had been selected to develop the guidance subsystem for the *Agile* missile. *Agile* is a highly maneuverable, short-range, air-to-air missile under advanced development at NWC China Lake, Calif.

10 — Admiral Thomas H. Moorer, Chairman of the Joint Chiefs of Staff, informed the House Armed Services Committee that Russia's first aircraft carrier had been launched. The ship is almost 900 feet long, weighs approximately 40,000 tons and has a flight deck about 600 feet long covering the after section and extending over the port side. It apparently is designed to operate V/STOL aircraft and helicopters. Admiral Elmo R. Zumwalt, Jr., Chief of Naval Operations, later reported that a second new Russian carrier was also on the way.

10 — Dr. Jane O. McWilliams took the oath of appointment, thus becoming the first female Navy flight surgeon candidate.

13 — The Secretary of the Navy announced that an agreement with the United Kingdom had been signed providing for an eight-month joint study of an advanced V/STOL *Harrier* involving participation by Rolls-Royce, Hawker Siddeley, Pratt & Whitney Aircraft and McDonnell Douglas. The overall aim was to determine the feasibility of

joint development of an advanced concept V/STOL incorporating a Pegasus 15 engine and an advanced wing.

16 — U.S. bombers attacked North Vietnamese positions in Laos after North Vietnamese forces struck a Laotian town. The U.S. command declared that the bombing raids were staged at the request of the Vientiane government. The North Vietnam ground attack was described as "a major violation of the cease-fire."

17 — The Secretary of Defense announced plans to close or consolidate military bases to achieve an overall estimated saving of some $3.5 billion over the next ten years and the elimination of 42,800 military and civilian positions. The plan, as modified during early phases of implementation, included several cutbacks and realignment impacting Naval Aviation: naval air stations at Imperial Beach, Calif., Glynco and Albany, Ga., and Quonset Point, R.I., were to be closed; operations were to be reduced at NAS Lakehurst, N.J., and NAS Alameda, Calif.; the Naval Weapons Evaluation Facility was to be reduced in size and made a component of the Naval Missile Center; the Naval Air Engineering Center, Philadelphia was to be disestablished and its principal functions transferred to NAS Lakehurst and NAS Patuxent River, Md.; and the Naval Electronic Systems Test and Evaluation Facility, Webster Field, St. Inigoes, Md., was to be closed and its functions transferred to the Naval Electronics Laboratory, San Diego.

19 — All minesweeping operations off North Vietnam were again suspended as the U.S. government accused North Vietnam of violating the cease-fire agreement.

20 — The U.S. State and Defense Departments disclosed that U.S. military reconnaissance flights over North Vietnam had been resumed.

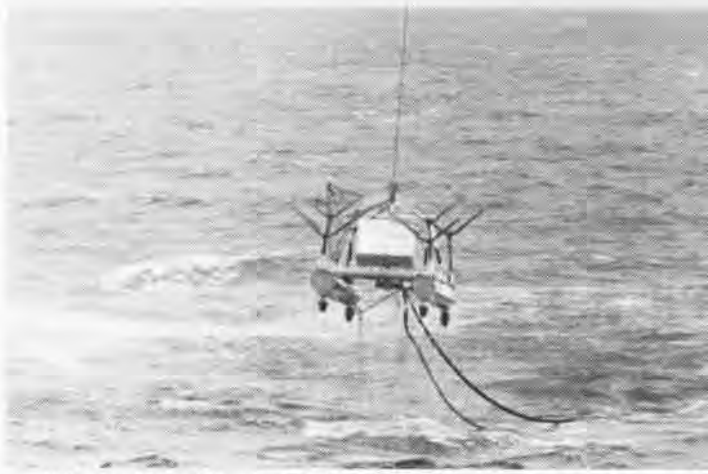
23-24 — Air-sea rescue craft dropped communications gear to the 70 crewmen and officers who were forced to abandon USS *Force* when it caught fire while returning to Guam from mine-clearing operations off Haiphong. The men were picked up by the British merchant ship *Skraynes*. The sinking was the first Navy loss of a ship since the sinking of the *Scorpion* with 89 men in May 1968.

25 — The arrival of the prototype Grumman E-2C, the first of four *Hawkeyes* scheduled for extensive Navy testing, prompted a brief welcoming ceremony at the Naval Air Test Center, Patuxent River.

27 — U.S. jet fighters bombed Communist forces three miles from Phnom Penh, on the opposite side of the Mekong River.

27 — The Chief of Naval Operations designated this day as official Naval Tribute Day to POWs, with May 4 as an alternate date.

27-29 — Test pilots across the nation gathered at the Naval Air Test Center, Patuxent River to celebrate the Test Pilot School's 25th anniversary. Symposium topics ranged from the evaluation of today's F-14A and S-3A through research on tomorrow's XFV-12A.



Helos participated in mine clearing of North Vietnamese waters.

30 — The last Marine NAP (enlisted Naval Aviation Pilot) retired. He was Master Gunnery Sergeant Patrick J. O'Neil who began his active duty during WW II and completed over 30 years of active service.

May

3 — The Defense System Acquisition Review Council, at the conclusion of a review of the *Harpoon* project, concluded that the cruise missile had shown excellent progress during the advanced development phase and approved its engineering development.

8 — The 62nd anniversary of Naval Aviation was celebrated throughout the aeronautical community. The date is based on Navy's purchase of its first airplane, the A-1 *Triad*, in 1911.

8 — In a ceremony at the Douglas Aircraft Division, Long Beach, the first McDonnell Douglas C-9B *Skytrain* jet transports were accepted by the Navy and delivered to Fleet Tactical Support Squadrons One and Thirty. A com-

mercial version of the DC-9, the C-9B has a maximum 32,444-pound payload range of 1,150 statute miles with a ferry range of about 3,400 miles. It accommodates 107 passengers five-abreast.

9 — An aircraft Lightning and Precipitation-Static Environmental Test Laboratory was dedicated at the Naval Air Test Center. The laboratory is to be used to determine the effect of lightning and other electrical phenomena on modern aircraft and airborne electronic equipment.

14 — The unmanned *Skylab I* orbital workshop was launched into near-earth orbit to establish the first U.S. orbital laboratory in the four-mission *Skylab* program.

18 — A four-day trial of a prototype glide slope indicator was completed aboard USS *Truxtun*. The indicator, developed by the Naval Air Engineering Center, consisted of a hydraulically stabilized Fresnel lens. It was one of several steps being taken to achieve an all-weather capabilitity with LAMPS helicopters.

19 — The President criticized Hanoi for violating the cease-fire agreement. He declared that Hanoi failed to provide a "full accounting for Americans missing in action."

24 — The Secretary of Defense ordered the Navy to end its controversial use of the island of Culebra as a practice gunnery range. Gunnery and air bombardment training was ordered shifted to Desecheo and Monito, two uninhabited islands off Puerto Rico's west coast, by mid-1975.

25 — The first production RH-53D *Sea Stallion*, especially configured for the airborne mine countermeasures mission, arrived at the Naval Air Test Center for weapons system trials. Navy Preliminary Evaluation and the initial phase of Board of Inspection and Survey trials had begun at Sikorsky Aircraft Division on May 15.

25 — E-1B *Tracers*, better known as *Willy Fudds*, ended an era as all E-1 training in the Pacific Fleet was terminated. Those squadrons deployed with *Tracers* were to begin their phase-out programs.

25 — *Skylab II*, carrying a three-man, all-Navy crew of Captain Charles Conrad, Commander Joseph Kerwin, MC, and Commander Paul Weitz, rendezvoused with the earth-orbiting *Skylab I* workshop. Among the crew's first tasks was repairing the *Skylab I* meteoroid shield and solar array system which had been damaged during launch. The crew boarded the workshop, made repairs, conducted medical experiments and studied solar astronomy and earth resources for 28 days before returning to earth on June 22.

June

4 — New Communist attacks were staged in southeastern Cambodia and U.S. bombing began again after a week's lull.

6 — A living memorial to NAS Lemoore-based squadrons which served in Vietnam was dedicated at the naval air station. The memorial, built with funds provided by the Red River Valley Fighter Pilots Association, consists of a 200-yard-long walk planted with nearly 100 shade trees.

7 — The Deputy Secretary of Defense directed the Navy to produce preliminary plans for a $250 million prototype development plan for a jet fighter aircraft costing less than the F-14 *Tomcat* missile-armed fighter. He also authorized the Navy to negotiate with Grumman Aerospace Corporation for an additional 50 *Tomcats* armed with *Phoenix* missiles, for a total of 184 on order.

11 — A BQM-34A, equipped with an integrated target control system (ITCS), was successfully tested by the Naval Missile Center. The ITCS combines in one radio link the functions of control, tracking and telemetry that

The Navy accepted its first McDonnell Douglas C-9B Skytrain II jet transport when VR-1, NAS Norfolk, received the City of Norfolk.

are involved in target operations, rather than the several links previously required.

13 — The National Aeronautics Association presented the Robert J. Collier Trophy for 1972 jointly to Navy's Task Force 77 and to the Seventh and Eighth Air Forces for their "demonstrated expert and precisely integrated use of advance aerospace technology" in Operation *Linebacker II*, the 11-day air campaign in December 1972 that "led to the return of the United States prisoners of war."

13 — The U.S., North Vietnam, South Vietnam and the Vietcong signed an agreement to improve enforcement of the Vietnam cease-fire accord of January 27. The 14-point document restated earlier provisions and called for an end to all fighting in Vietnam on June 15, the cessation of U.S. reconnaissance flights over North Vietnam, the resumption of U.S. minesweeping, the determination of the two South Vietnamese parties of their areas of control "as soon as possible," and the resumption of talks on U.S. economic aid to North Vietnam.

14 — The 2,700th A-4 delivered to the Navy, an A-4N *Skyhawk*, was accepted at the Palmdale, Calif., production facility of the McDonnell Douglas Corporation.

17-25 — Leonid Brezhnev, General Secretary of the Central Committee of the Communist Party of the Soviet Union, began a nine-day visit to the U.S. On June 19, four agreements between the U.S. and the U.S.S.R., were signed: agriculture, transportation, studies of the world oceans, and cultural and scientific exchanges. On June 21 two more agreements were signed: the basic principles of negotiations on the further limitation of strategic offensive arms and scientific and technical cooperation in the peaceful uses of atomic energy. On June 22, President Nixon and Mr. Brezhnev signed a U.S.-Soviet agreement on the prevention of nuclear war. On June 24, at San Clemente, Brezhnev met the three *Skylab* astronauts — Captain Charles Conrad and Commanders Joseph Kerwin and Paul Weitz — and congratulated them on their record-breaking 28-day space flight.

20 — An F-14 shot itself down over the Pacific when a *Sparrow* air-to-air missile launched erratically from its mount beneath the aircraft. The Grumman crewmen ejected and were rescued by a Navy helicopter. The F-14 was flight testing the missile's ability to drop clear of its mount before firing, but the missile failed to clear, thus striking the fuselage and exploding. It was the third loss of an F-14 since the aircraft's December 1970 maiden test flight.

21 — The Defense Department disclosed that the U.S. was continuing to bomb heavily in Cambodia; 140,000 tons of bombs reported dropped during March, April and May.

22 — The all-Navy crew of *Skylab II* astronauts was recovered after their 28-day mission in space by Helicopter Composite Squadron One (HC-1) and flown aboard USS *Ticonderoga* (CVS-14).

24-26 — A 200-truck supply convoy arrived in Phnom Penh from Kompong Som without harassment. Fighting continued 15 miles from Phnom Penh and around several large towns. U.S. planes flew bombing missions in support of government troops as heavy fighting continued around the Cambodian capital.

30 — At the end of the fiscal year, the total number of personnel on duty with the aeronautical organization, compared to the same time last year, was: grand total 134,893 vis-a-vis 138,585 a year earlier; officers in a flying status 20,530 vis-a-vis 21,229; officers in a non-flying status 2,650 vis-a-vis 2,933; enlisted personnel 111,332 vis-a-vis 114,141; enlisted in a flying status 6,607 vis-a-vis 7,197; aviation officer candidates 381 vis-a-vis 282 in 1972.

July

1 — The Joint Parachute Test Facility, El Centro, Calif., was superseded by the National Parachute Test Range and its function was broadened to include parachute testing for the Army and other DOD-designated government agencies, as well as for the Navy and Air Force.

10 — In the 126th consecutive day of bombing, American jets struck north of Phnom Penh against rebel troops advancing close to the capital.

18 — The first two females began their training as Navy Flight Surgeons at the Naval Aerospace Medical Institute, Pensacola, along with 21 male Navy physicians. They were Lieutenants Jane O. McWilliams and Victoria M. Voge.

21 — The Commander in Chief of the Cambodian Army, Lieutenant General Sosthene Fernandez, stated that Cambodia would ask the U.S. to continue its bombing after the scheduled cutoff date of August 15.

27 — Operation *Endsweep* was officially closed and Task Force 78 was disbanded. During the six months of its existence, the airborne element had made 3,554 sweeping runs totalling 1,134.7 sweeping hours in 623 sorties; the surface elements had made 208 sweeping runs of 308.8 hours. The aviation material casualties were three helicopters lost in operational accidents.

28 — *Skylab III* commanded by Captain Alan Bean in company with civilian doctor Owen Garriott and Major Jack Lousma, USMC, was launched into space.

31 — HSL-33, the Navy's first squadron dedicated solely to providing Light Airborne Multi-Purpose Systems detachments for LAMPS-configured ships of the Pacific Fleet, was commissioned at NAS Imperial Beach, Calif.

August

3 — The Communists attacked within three miles of the center of Phnom Penh; American bombers inflicted heavy losses on the insurgents.

15 — After intensive bombing for more than six months, the U.S. ended its combat involvement in Cambodia, as

1973 and Naval Aviation

voted by Congress on June 30. Laotian government sources reported a deadlock in the peace talks between government officials and the pro-Communist Pathet Lao, and a renewal of fighting in southern Laos.

15 — According to the Defense Department, U.S. planes had dropped 7.4 million tons of bombs on all four countries of Indochina since 1965, almost four million of which had been dropped since the beginning of 1969. The figures for the period from 1969: Cambodia — 511,000 tons, North Vietnam — 237,600 tons, South Vietnam — 1,577,000 tons, and Laos — 1,646,000 tons. Total cost of the war was estimated at over $111 billion. By April 1, 1973, more than 2,000 U.S. airmen had been killed, and more than 1,360 missing servicemen were identified as fliers. About 3,700 planes had either been shot down or crashed because of hostile action.

16 — The F-14's quick reaction, dogfight capability was demonstrated at the Pacific Missile Range when, from a distance of less than a mile, the aircraft shot down a maneuvering QT-33 target drone with a *Sparrow III*.

24 — The U.S. and Thailand jointly announced that the U.S. would begin immediately to withdraw some of its troops and planes from Thailand.

26 — Operation *Deep Freeze* 74 in support of the U.S. Antarctic research program got under way when two LC-130F *Hercules* of VXE-6 departed NAS Quonset Point, R.I.

29 — Helicopter Mine Countermeasures Squadron Twelve received the first RH-53D *Sea Stallion*. The RH-53D has a minesweeping configuration.

30 — To provide exceptional management of advanced acoustic sensors for use by antisubmarine warfare aircraft, the Naval Air Systems Command established the Air ASW Acoustic Systems Project Office (PMA-264).

September

1 — The transfer of Navy F-4 model management from Naval Air Systems Command Headquarters to the Naval Air Rework Facility, North Island was completed.

1 — The first midwinter mail drop in the 18-year history of Operation *Deep Freeze* was completed by the Royal New Zealand Air Force. The P-3 *Orion* completed a nonstop, round-trip flight to McMurdo Station, dropping 840 pounds of mail to the 169 U.S. Navy men and scientists wintering over on the Antarctic Continent.

5 — In a statement from the U.S. delegation in Saigon to the Joint Military Team, the U.S. accused North Vietnam and the Vietcong of not fulfilling provisions of the Paris cease-fire agreement dealing with missing Americans and the return of the remains of the deceased.

6 — A BQM-34E *Firebee II*, equipped with a wing of graphite-epoxy composite, was successfully test flown at the Mugu Sea Test Range reaching a speed of Mach 1.6 at 40,000 feet and a maximum acceleration of six Gs. The graphite-epoxy composite promises to save 40 percent of the weight of metal counterparts in various aeronautical applications. The test wing was designed and fabricated by the Naval Air Development Center.

7 — The Navy announced that the *Blue Angels* flight demonstration team would, in the future, switch to slower, smaller and less expensive A-4F *Skyhawks* rather than continue use of the F-4J *Phantoms* they had been flying since 1969. Demonstrations were suspended in August after three men were killed and six planes were lost in accidents during the year.

10 — In a 32-page white paper requested by the Senate Armed Services Committee, the Defense Department disclosed secret air strikes in support of the Cambodian government in 1970 and 1971.

11 — In parallel protests, the governments of the U.S. and South Vietnam accused North Vietnam of rebuilding former American airfields in Vietcong territory.

13 — Israeli and Syrian planes clashed over the Mediterranean Sea in the largest air battle since the 1967 war.

15 — Air Test and Evaluation Squadron One (VX-1) was relocated from Key West, Fla., to Patuxent River, Md.

18 — Patrol Wing Two, NAS Barbers Point, Hawaii, consisting of VPs 1, 4, 6 and 22, participated in *RIMPAC 73*, a four-nation naval exercise involving some 20 ships, 200 aircraft and 14,000 U.S. Navy and Marine Corps personnel and New Zealand, Australian and Canadian units.

20 — The Naval Air Systems Command announced that on January 6, 1974, the office performing aircraft maintenance documentation functions would be transferred to Naval Air Technical Services Facility, Philadelphia, Pa.

24 — The Naval Air Systems Command established the assault and mine countermeasures helicopter designated

Evaluation programs included icing tests in Canada of HH-2D Seasprite.

project (PMA-255). This action upgraded management of development and acquisition of these helicopters by replacing the project coordinator with a project manager.

25 — The three astronauts of *Skylab III* made a successful splashdown in the Pacific, ending a record 59-day, 24-million-mile flight. They were recovered by Helicopter Squadron One, flown aboard USS *New Orleans* (LPH-11).

29 — Completing the first Soviet manned space flight in over two years, two Soviet astronauts successfully ended a two-day test flight of a modified *Soyuz* spaceship.

October

1 — Formal Board of Inspection and Survey service acceptance trials of the S-3A began at the Naval Air Test Center, Patuxent River. The tests were to utilize seven S-3A aircraft during a four-month period, including weapons system checkouts, carrier suitability, flying qualities and performance, and propulsion and airframe evaluation.

1 — The relocation of Antarctic Development Squadron Six (VXE-6) from NAS Quonset Point, R.I., to NAS Point Mugu, Calif., became effective.

2 — The Naval Air Systems Command announced plans to develop a variable altitude, supersonic recoverable target for use in connection with the development and test of advanced weapon systems.

5 — *Midway* (CVA-41) with embarked Air Wing Five (CVW-5) put into Yokosuka, Japan, marking the first home-porting of a complete carrier task group in a Japanese port as a result of the accord arrived at on August 31, 1972, between the U.S. and Japan. It also inaugurated the concept of an air wing being completely supported by and based continuously on a carrier, which will apply in the future at other ports of call and even in the U.S. In addition to the morale factor of dependents housed at a foreign home port, the development has strategic significance in that it will facilitate continuous positioning of three carriers in the Far East at a time when the economic situation demands the reduction of total U.S. carriers.

6 — The heaviest Arab-Israeli fighting in the Middle East, since the 1967 war, broke out on two fronts on the Jewish holy day of Yom Kippur as Egyptian forces crossed the Suez and Syria attacked the Golan Heights.

9 — The Pentagon announced that USS *Guadalcanal* (LPH-7), an amphibious assault ship with U.S. Marines aboard, was operating in the eastern Mediterranean as part of the Sixth Fleet. Other elements of the Fleet were moving toward Crete, including the carriers *Independence* and *Roosevelt*, as a result of the Middle East war.

11 — A Laotian government spokesman announced that on October 12 the Communists would begin moving into the two non-Communist capitals of Laos, the administrative capital of Vientiane and the royal capital of Luang Prabang, under the terms of the Laotian peace agreement. The two capitals were to be neutralized.

Soviet Communist Party Leader Brezhnev and President Nixon examine plaques presented by Skylab II Astronauts Conrad, Weitz and Kerwin.

12 — Israeli forces advanced to within 18 miles of the Syrian capital of Damascus. The Syrian command announced the downing of 35 Israeli planes and reported that Israeli missile boats had sunk three freighters — Soviet, Japanese and Greek — at the ports of Latakia and Tartus. Yakov A. Malik, the Soviet delegate to the U.N., accused Israel of "barbarous" attacks on nonmilitary targets.

17 — The Arab oil-producing states, meeting in Kuwait, announced a five percent monthly reduction in the flow of oil to the U.S. and other countries supporting Israel. In Washington, four Arab foreign ministers, representing 18 Arab countries, met with President Nixon and Secretary of State Kissinger to present a peace proposal.

17 — Three outstanding squadrons for FY 73 were named: Fighter Squadron 161 received the Admiral Joseph Clifton Award, Attack Squadron 75, the Admiral C. Wade McClusky Award and Helicopter Antisubmarine Squadron 11, the Admiral Jimmy Thach Award.

20 — An Israeli military spokesman reported that an Israeli bridgehead in Egyptian territory on the west bank of the Suez Canal had been enlarged. The Israeli task force reportedly numbered 10,000 men and 200 tanks. The Saudi Arabian government announced that it was halting all oil exports to the U.S. At the request of the Soviet Union, Secretary of State Henry Kissinger arrived in Moscow and began talks with Soviet communist party leader Leonid I. Brezhnev on ending the Middle East crisis.

21 — Four Persian Gulf states — Kuwait, Qatar, Bahrain and Dubai — announced a total cutoff of oil exports to the U.S. At a meeting of the Security Council, the U.S. and the U.S.S.R. presented a joint resolution calling for an immediate cease-fire in-place in the Middle East and for implementation of the 1967 Security Council Resolution 242 demanding Israeli withdrawal from territories occupied since the 1967 war. The U.S.-Soviet resolution had been worked out at the Brezhnev-Kissinger meeting in Moscow.

22 — A cease-fire became effective on the Egyptian front. Israeli and Syrian forces continued to fight. In separate statements, Iraq and the Palestinian Liberation Organiza-

1973 and Naval Aviation

tion rejected the cease-fire called for by the Security Council. The Jordanian government announced acceptance of the cease-fire; however, it claimed that the Jordanian army contingent in Syria was under Syrian command.

23 — The Security Council adopted a resolution reaffirming the cease-fire and asking Israel and Egypt to return to positions held when the cease-fire became effective at 12:52 p.m. (New York time) on October 22. The resolution asked that U.N. observers be stationed along the Israeli-Egyptian cease-fire line. U.N. Secretary General Kurt Waldheim announced that Syria would abide by the cease-fire, contingent upon Israeli withdrawal from all territories occupied in 1967.

23 — The first of three new LC-130R Lockheed *Hercules* was delivered to the National Science Foundation for assignment to VXE-6 for use in supporting the National Science Foundation's polar programs.

24 — Egyptian and Israeli forces continued to fight. At an emergency session of the U.N. Security Council considering Egypt's proposal that U.S. and Soviet troops police the cease-fire, the Soviet delegate to the U.N., Yakov A. Malik, declared that the Security Council should punish Israel. He appealed to U.N. members to cut diplomatic ties with Israel. In the U.S., the White House announced that it would not send troops to the Middle East and it hoped that no other foreign powers would.

25 — Due to the situation in the Middle East, the U.S. government ordered a worldwide "precautionary alert" of its military forces.

27 — The State Department announced that Egypt and Israel had agreed to negotiate directly on implementing a cease-fire.

29 — The Defense Department announced that a naval task force, including the carrier *Hancock*, five destroyers and a tanker, had been ordered to the Indian Ocean.

31 — The Defense Department ended the military alert ordered the previous week, except for the Sixth Fleet.

November

16 — USS *Ticonderoga* (CVS-14) was decommissioned after nearly 30 years of service to the Navy since her launching February 7, 1944. A veteran of fierce battles in WW II and the first, with *Constellation*, to respond in naval warfare against North Vietnam in 1964, the old carrier retrieved the astronauts of *Apollos 16* and *17* and *Skylab II* in addition to other significant service.

16 — *Skylab IV*, commanded by Lieutenant Colonel Gerald P. Carr, USMC, and with a crew consisting of Lieutenant Colonel William R. Pogue, USAF, and Edward G. Gibson, civilian, was launched at the Kennedy Space Center. The scheduled 56-day "open-ended" space flight had among its aims, study of the Comet Kohoutek, earth resources and the sun.

18 — At a commemoration in honor of former Representative Carl Vinson's 90th birthday, the President announced that the latest aircraft carrier still in the design phases, CVN-70, would be named USS *Carl Vinson*.

21 — In the first test of its full arsenal of *Phoenix* missiles, an F-14 operating over the Pacific Missile Range Sea Test Range fired six *Phoenix* missiles and guided them simultaneously at six separate targets 50 miles away, obtaining four direct hits.

26 — Two F-14As and an S-3 were flown aboard *Forrestal* (CVA-59) for carrier suitability evaluation by the Naval Air Test Center as part of the Board of Inspection and Survey service acceptance trials. A third F-14A had been hoisted aboard the carrier two days earlier. Simultaneously with these trials, *Forrestal's* automatic carrier landing system was certified for recovery of F-4s, A-7s and RA-5Cs.

December

1 — The *Blue Angels* became the Navy Flight Demonstration Squadron (*Blue Angels*) and were designated a shore activity located at NAS Pensacola.

7 — USS *Tarawa* (LHA-1), first of a new class of amphibious ships, was launched at Pascagoula, Miss.

13 — The U.S. Senate passed a defense bill appropriating $73.2 billion, $3.5 billion less than the administration had requested. At the same time, the Senate forbade spending any of the money to send oil to Indochina.

15 — Increasing signs of a strong buildup of North Vietnamese men and equipment in South Vietnam were reported. Whereas the Communists' military personnel strength in the south was estimated at 200,000 a year ago, estimates for mid-December were 270,000.

18 — The U.S.S.R. sent the *Soyuz 13* spacecraft with two astronauts aboard into space, marking the first time that both the U.S. and the Soviet Union have had astronauts in space simultaneously.

20 — Secretary of State Henry Kissinger and North Vietnamese Politburo member Le Duc Tho were scheduled to meet in Paris for the second major attempt within a year to prevent the collapse of the Vietnam cease-fire. The meeting was superseded by the Arab-Israeli conference.

21 — The Arab-Israeli peace conference opened in Geneva in an effort to ameliorate relations and resolve some of the differences that have long plagued the Middle East.

31 — NAS Ellyson Field, Pensacola, Fla., officially became Naval Education and Training Program Development Center to administer the Navy's enlisted advancement system, including the development of advancement and special examinations as well as administering and conducting various courses, studies and training programs.

Commissionings 1973

February 1	Commander Third Fleet
April 1	Commander Air Antisubmarine Wing One (ComVSWing-1)
	Commander Helicopter Antisubmarine Wing One (ComHSWing-1)
	Tactical Electronic Warfare Squadron 136 (VAQ-136)
May 1	Deputy Tactical Air/Commander Tactical Air, Atlantic, at Jacksonville
July 1	Commander Fleet Tactical Support Wing One, at Norfolk
	Commander Naval Air Force, U.S. Pacific Fleet, Representative, Hawaii
	Atlantic Fleet Photographic Center
	National Parachute Test Range, El Centro
July 31	Training Squadron 86 (VT-86)
	Helicopter Antisubmarine Squadron, Light 33 (HSL-33)
August 12	Helicopter Antisubmarine Squadron, Light 32 (HSL-32)
August 31	Fleet Composite Squadron 12 (VC-12)
	Fleet Composite Squadron 13 (VC-13)
December 1	Navy Flight Demonstration Squadron (*Blue Angels*)
December 14	Tactical Electronic Warfare Squadron 137 (VAQ-137)

Decommissionings 1973

February 15	Naval Special Warfare Group Two (NavSpecWarGru 2)
March 4	Fleet Air Support Unit, Da Nang, RVN
May 31	Tactical Air Control Group One (TACGru 1)
	Tactical Air Control Squadron Eleven (VTC-11)
	Tactical Air Control Squadron Thirteen (VTC-13)
June 30	Commander Carrier Antisubmarine Air Group 53 (CVSG-53)
	Commander Carrier Antisubmarine Air Group 56 (CVSG-56)
	Commander Carrier Antisubmarine Air Group 59 (CVSG-59)
	Commander Antisubmarine Warfare Group Three (ComASWGru 3)
	Commander Antisubmarine Warfare Group Four (ComASWGru 4)
	Air Antisubmarine Squadron 27 (VS-27)
	Air Antisubmarine Squadron 35 (VS-35)
	Navy-Marine Corps Reserve Training Center, Santa Monica
	Commander Fleet Air Wing Ten (ComFAirWing 10)
	Commander Fleet Air, Adak
	Commander Fleet Air, Alameda
	Commander Fleet Air, Argentina
	Commander Fleet Air, Azores
	Commander Fleet Air, Bermuda
	Commander Fleet Air, Brunswick
	Commander Fleet Air, Jacksonville
	Commander Fleet Air, Hawaii
	Commander Fleet Air, Quonset
	Commander Fleet Air, Patuxent
August 31	Antisubmarine Fighter Squadron 76 (VSF-76)
	Antisubmarine Fighter Squadron 86 (VSF-86)
October 1	U.S. Navy Overseas Air Cargo Terminal, Clark Air Base, Philippines
	U.S. Navy Overseas Air Cargo Terminal, Yokota, Japan
November 1	Fleet Aviation Specialized Operational Training Group, Lakehurst
	Naval Air Technical Training Center, Jacksonville
November 16	USS *Ticonderoga* (CVS-14)
December 1	Commander Fleet Air Wing Five (ComFAirWing 5)

CNO Safety Awards

ComNavAirLant
VF-31
VF-43
* VA-35
VA-83
* VAW-123
VP-16
VRF-31
VS-24
RVAH-13
HC-6

CNATra
VT-5
*** VT-28
VT-9
VT-25
HT-18

ComNavAirPac
VF-143
VA-97
VA-127
VA-165
VS-29
VP-40
* VAQ-135
VQ-1
VAW-116
HS-2

CGFMLant
* VMA-324
VMGR-252
HEDRon
HMM-261

ComNavAiResFor
VF-302 (NAS Miramar)
VA-204 (NAS Memphis)
VP-90 (NAS Glenview)
VS-72 (NAS Norfolk)
VR-53 (NAS Dallas)
HS-74 (NAS Quonset Point)

CGFMFPAC
* VMFA-531
VMCJ-1
VMAT-102
** HMM-163
HMM-262

CG 4th MAW/MARTC
VMA-322 (NAS South Weymouth)
HMH-769 (NAS Alameda)

* Second consecutive award
** Third consecutive award
*** Fourth consecutive award

NAVAL AIRCRAFT

SKY

Among the Navy's latest proud possessions are the McDonnell Douglas C-9B *Skytrain II* transports. These new twin jets have brought the Navy into the jet transport age, replacing outmoded piston-engine transports as combined personnel/cargo haulers.

Selected on the basis of a competitive evaluation of available certified twin-jet transports, the C-9B is a convertible passenger/cargo version of the civil series 30 DC-9 — a stretched development of the original Douglas DC-9 transport. It is the second military version, the Air Force having previously selected essentially the same model as their C-9A *Nightingale* aeromedical airlift transport which has been in service for more than five years. Due to the specialized nature of the Air Force operations and the resultant name for its aircraft, a different name was selected for the Navy version — one of the exceptions to normal military aircraft-naming practice in which all versions of the same basic design carry the same name, even though used by different services. The *Skytrain II* name carries on the traditions of the famed DC-3 of WW II, the original *Skytrain*.

The prototype DC-9 flew on February 25, 1965, and DC-9s have since become the most widely used twin-jet airline transports. The Navy recently took delivery of the 700th DC-9 built as one of its C-9Bs. The DC-9 has grown considerably in dimensions — and gross weight — over the four basic model series built to date, with the Navy choosing one of the stretched models.

In common with other convertible passenger/cargo versions, the C-9Bs differ from standard airline aircraft in having a large cargo door on the port side of the forward fuselage, along with other necessary cargo-handling features. All other details are essentially the same as airline models.

The eight C-9Bs that have been purchased are in service with VRs 1 and 30 as fleet logistic support transports.

C-9B

C-9A

DC-9

TRAIN II

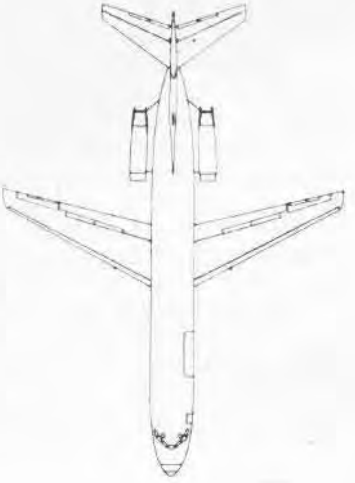
C-9B

C-9B

C-9B


C-9B

Length	119.3′
Height	27.5′
Wing span	93.3′
Power plant	2 P&W JT8D-9
	14,500 lbs. thrust
Max speed	495 kts.
Max cruise speed	474 kts.
Cruise ceiling	37,000′
Range	2,000 nm
Crew	3
Cargo capacity	10,000 lbs. full fuel
	32,444 lbs. max with partial fuel



WOMANPOWER

By JOC Tom Streeter and PHC Bill Hamilton

Flight lines are for professionals. High performance jets deafen the ears, and hand signals, as the primary means of communication, leave no room for error.

Crawling over and under multi-million-dollar aircraft, prepping them for another mission, plane captains display a maturity beyond their years. It's only during a lull, when they relax in the line shack, that their headgear comes off to reveal their youthfulness.

One of them is downright baby-faced, featuring pink cheeks which have obviously never known a razor. Off comes the headgear and a flop of blond curls makes this slender plane captain suddenly and completely feminine.

An indication of things to come?

Ellen "Bunny" Mahoney is not concerned about establishing tradition nor about being a first. However, for Fleet Composite Squadron Two at NAS Oceana, Va., she is the unit's first female plane captain and has been described as very competent in a job she obviously enjoys.

Bunny works for CPO Leonard Cappelli. "When I heard I was getting a girl on my line," he says, "all I could think was 'Why me?' But she sure has turned my attitude around."

"On my first plane I was plenty nervous," relates Bunny. "For the first couple of weeks I became a hermit. I was so tired when I got home, I just died. I'd ask the guys if they felt the same way and they would say 'no.' They always seemed to feel great. Now I've found out that it just takes a lot of getting used to. I've lost eight pounds since I've been on the line and that's great, but I've also gained two inches on my biceps.

"I've had a lot of help out here. Our skipper, Commander H. R. Taylor, has got to be the best of them all. He stops and corrects the little things I'm doing wrong. Like my hand signals — they were unsure, just like I felt. I'd kind of halfway hold up my fingers. He straightened me out and was nice about it."

Bunny loves the Navy and loves her job. She feels that in the Navy it's equal pay for equal work. The equal

work is not just lip service, it's right down the line. Bunny refuels her aircraft and tops off the oil. She keeps the plane clean, and preflights and post-flights it according to extensive checkoff lists. "When it's time for field day," says Chief Cappelli, "she's right in there working, even on her hands and knees, scrubbing the deck."

Of course, there are concessions to be made when a woman works in what is traditionally a man's world. "The guys in my crew have cleaned up their language since I joined them." In most aspects, Bunny has become like one of the guys, even to her hair. "I had hair to my waist before I came in. One day, while I was sitting over coffee with a couple of the guys, an officer came in and said, 'All of you men need haircuts,' so I got one too."

Seeing a girl on the flight line still brings stares from strangers but her own crew has adjusted quickly. "I'm amazed at how well she has been accepted," says Chief Cappelli. "Comparing her to other workers, I'd have her close to the top in all respects. She's good for morale, too. Not just because she's a woman but because she likes her job and works at it. I'd like to see her make third class right now."

Being the only woman on the line can be a little lonesome. "I'd like to have another girl working out on the line with me — but she would have to be sharp. I wouldn't want anyone who couldn't handle the job, male or female . . . but another girl sure would be nice to have for company."

Back home, Bunny began early to give her parents an indication of things to come. She loved to work on cars — her own, her mother's and her father's — and her parents learned to expect the unexpected.

Her decision to enter military service seemed natural enough and once she chose Navy, she didn't waste any time in promoting the cause. While in the recruiter's office, Bunny met two young men heading for the Army recruiter's desk. "I literally grabbed them away from the Army and told them to join the Navy instead." They did.

Ellen Mahoney has entered what was once a man's domain and has established her status as a pro.

IN DUNGAREES

. . . and in Navy Blue

By PH1 R. Pendergist

When 19-year-old Janice Hobson joined the Navy in Rocky Mount, N.C., a few miles from her home, she had no idea that one day she would be winging her way across country as a crew member aboard a C-131 — or that she'd be striking for aviation machinist's mate.

Jan's first flight was en route to basic training in Orlando, Fla. After recruit training, she settled into a desk job at NAS Norfolk, Va. "After living on a tobacco farm all my life," Jan says, "I'm accustomed to hard work and I wanted something more physical than a desk job."

She indicated this to LCdr. Paula J. Tyler, military personnel officer at NAS Norfolk. "When the opening came for an airman apprentice on Commander Naval Air Forces, Atlantic's C-131," says LCdr. Tyler, "we asked for approval for Jan to work as flight attendant on the VIP plane."

Now, the young airman spends her time en route to and from places she had always just read about. Her first extended cross-country flight was aboard a VIP Convair delivering passengers and cargo to Las Vegas, Nev., a city somewhat different from the farming community where she was reared, with its three general stores and "lots of parking space."

In addition to the typical airman duties of refueling, oiling and polishing the aircraft, Jan's duties are similar to those of a commercial airline stewardess, ensuring the comfort of the passengers and the cleanliness of the aircraft. Jan finds that polishing is the most physically tiring job she has. "Some nights when I get back to the barracks, every muscle in my body aches. These are the times when my room-mates are not so envious."

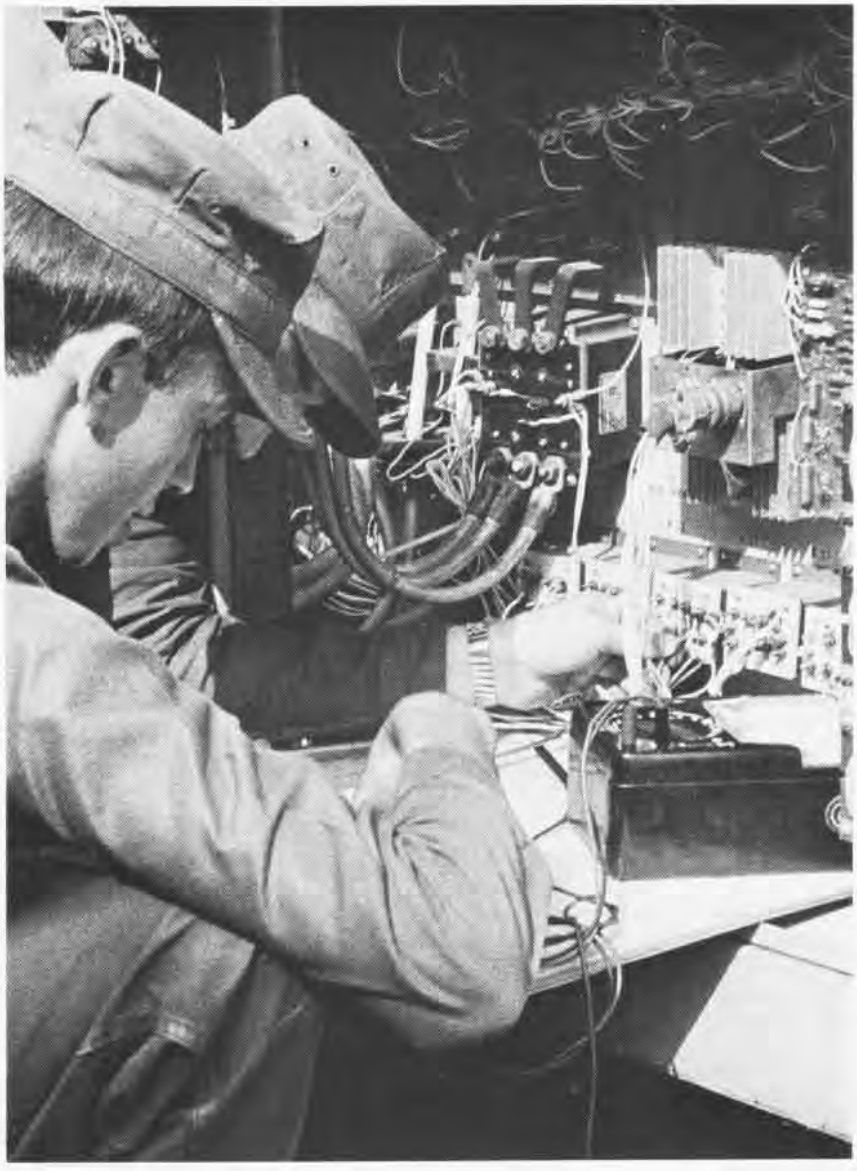
NAVY'S NEWEST

While USS Forrestal steamed off the Virginia Capes the last week in November, Navy's newest aircraft performed as advertised as they were subjected to their carrier suitability trials. The photos of the F-14 Tomcat and the S-3A Viking were taken by PH2 Terry C. Mitchell, CCGLant.

NAS North Island

Maintenance Training

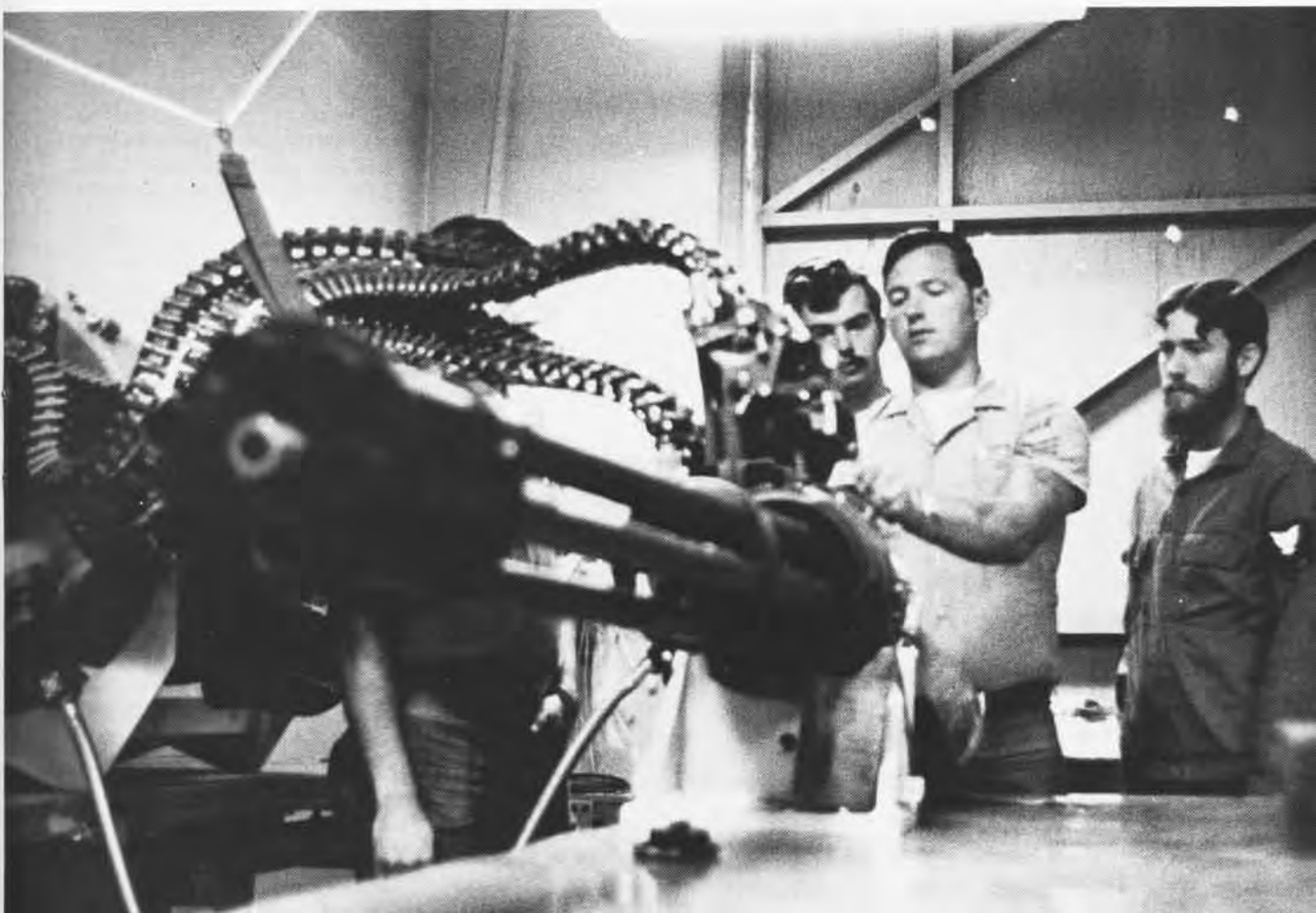
A plane, a missile and a book surrounded by electrons is the insignia of the Naval Air Maintenance Detachments at NAS North Island, Calif. It depicts the detachments' mission: to present theory and knowledge about aircraft and missiles to fleet personnel. Five detachments are aboard the NAS: 1025 handles the E-2 systems; 1083, S-24/E systems; 4033 is responsible for air launch weapons; 3020, for aviation maintenance administration; and 3033 takes care of ground support equipment. All are under the command of Commander Richard Mudgett. At 1025 and 1083, students are taught how to troubleshoot a piece of gear, and how to remove and repair the broken or damaged part. Computers identical to those in the aircraft are used as visual training aids. PFC Charles S. Owens and LCpl. Larry D. Poos, USMC, troubleshoot a mobile electronics power plant, right.



Story by JO3 V. A. Farrell

Photos by PH1 C. J. Markowski

At Det 3020 students learn how to handle the paper work necessary to run an efficient workshop and how to manage work centers and workshops. At 3033, the overhaul and repair of ground support equipment are the order of the day. Gasoline and diesel engines, air conditioning and refrigeration units, mobile electronics units — all the yellow gear — are learned from the ground, up and down. At 4033, the students learn about every type of ordnance fired or dropped from every type of naval aircraft. At the bomb assembly tables, PO1 E. D. Armstrong explains what a bomb fuse does and how it is inserted into the explosive, left. PO1 William M. Johnson, 4033 instructor, shows students parts of the M61A1 20mm gun which is one component of the weapons package of the A-7E and F-14, below. North Island will soon have another maintenance training detachment — one which will teach the systems of the S-3A Viking.



PEOPLE PLANES AND

It's a small, small world. When **ex-POW** LCdr. Michael Christian attended a lecture on the A-6E ejection seat at VA-42, he discovered that the instructor was the man who had rigged his seat six years before — when he ejected over North Vietnam. The instructor? AMC R. M. Foster.

At NATTC Lakehurst, N.J., late last year, 22 high school students spent two days learning all about Navy Lakehurst. The students were members of the Junior Reserve Officer Training Corps at St. Thomas Aquinas High School, Edison, N.J. The **NJROTC** units give high-school-age students the opportunity to enter military service under an accelerated advancement program which familiarizes them with concepts of naval leadership, national security and the traditions and history of the Navy.

NAS Lemoore, Calif., family housing has been named **Alvarez Village** in honor of LCdr. Everett Alvarez, Jr., the first Naval Aviator to be taken prisoner by North Vietnam.

In December, the **Naval Air Rework Facility**, Cherry Point, N.C., celebrated its 30th anniversary. The 2,300 civilians and 70 Marines under the command of Colonel E. E. Pearcy are responsible for the East Coast rework of the F-4, the CH-46, the OV-10 and the AV-8A. Eleven of the fourteen original employees still employed at the NARF posed for the photo.

With a little help from their friends, recruiters manage to spread the word.

In November, the VC-10 **Challengers** marked their fifth accident-free year with 21,000 accident-free hours. The Leeward Point-based squadron, led by Commander Steve Zwick, flies the F-8K and US-2.

With a Combined Federal Campaign goal of $19,700 to meet, **John F. Kennedy** (CVA-67) sailed over the top and contributed a total of $50,431.

For the second consecutive year, all of CVW-1 and *Kennedy* personnel earned Blue Nose certificates for operations north of the Arctic Circle. When Commanders "Bear" Taylor and Les Jackson received their certificates from RAdm. J. P. Moorer, they recalled the first Blue Nose certificates they received — in 1960 from Admiral Thomas H. Moorer, Chairman of the Joint Chiefs of Staff and brother of RAdm. Moorer.

Lt. Robert J. Carson, air intelligence officer with **TACRon-33,** NARU Norfolk, has discovered what is believed to be the first known surface expression of an active fault in the State of Washington. He noticed the fault in early 1973 while examining aerial photographs and has conducted other investigations, including one across the fault — Saddle Mountain, located in the Southwestern Puget Lowland about 40 miles west of Seattle.

PLACES

Major Paul C. Kerwin, X.O. of VMA(AW)-121, was pleasantly surprised one morning in December when his brother and a couple of friends made an unscheduled stop at MCAS Cherry Point. His brother? Astronaut **Joe Kerwin.** The friends? Kerwin's space partners from *Skylab II*, Captains Charles Conrad, Jr., and Paul Weitz.

Also in November, **VT-29**, NAS Corpus Christi, Texas, counted its 150,000th accident-free flight hour, a milestone in its record 14½ years without an accident. Commander Albert Mills leads the squadron that provides airborne navigation instruction for Naval Aviators and Naval Flight Officers.

In early December, **Coral Sea** (CVA-43) sailed home to Alameda from her first "peacetime" cruise to WestPac in more than eight years.

Coral Sea participated in *Endsweep*, supporting the minesweeping forces engaged in clearing mines from North Vietnamese waters. The carrier's career information and counseling team earned the ComNavAirPac Golden Anchor Award in recognition of its achievements in support of an all-volunteer force.

One of the senior citizens among carriers, **Roosevelt** (CVA-42), raised $35,000 as her contribution to the Combined Federal Campaign, while she steamed in the Mediterranean with other elements of the Sixth Fleet.

RTU-305, Point Mugu, Calif., is flinging down the gauntlet to other units — Navy, Air Force, Marine Corps and Army. RTU-305 believes that its pilots have flown more different types of aircraft than any other unit. A logbook count reveals a total of 106 aircraft types from the de Haviland *Mosquito* to the F-14 *Tomcat*. RTU's list includes both military and civilian types, but only the basic model, for example, A-7 but not A-7A and A-7B.

Two more *Dambusters* of VA-195 have been added to the ranks of **Kitty Hawk**'s (CV-63) double centurion club — Commander Norman D. Campbell, squadron C.O., and Lt. Brian J. South, *Dambuster* personnel officer. Cdr. Campbell has compiled a total of 1,051 carrier landings with over 1,000 hours in the A-7, while Lt. Smith, aboard *Kitty Hawk* for his second WestPac cruise, has 167 *Corsair* combat missions to his credit.

Six officers, a Volkswagen bus and five bicycles combine to save gasoline and money driving from Seattle to weekend duty with **NARS-T1** at NAS Whidbey Island. With everything taken into account, Commander Wayne Cottingham, originator of the idea and driver of the Volkswagen, figures the six men get 121.2 miles to the gallon — per man.

In a change-of-command ceremony on board **Independence** (CV-62), LCdr. P. W. Parcells relieved Commander W. W. Clexton, Jr., as C.O. of VA-102.

When ComFAirMed needed the assistance of a C-118 to meet operational commitments, the message passed through the chain of command to **VR-52 Det Washington.** The fuse was short . . . just 24 hours. Take an optometrist from West Virginia, three pilots from commercial airlines, a special equipment manufacturer from Virginia and a recent law school grad, all SARS, add one C-118, nine TAR enlisted men and one SAR mechanic from Kentucky, and you have two crews. During the 14-day mission, the C-118 made ten airlifts carrying passengers and cargo throughout the Med.

VP-67, NAS Memphis, has a new C.O. He is Commander Stanford L. Brown who relieved Commander John W. Anthuis, Jr.

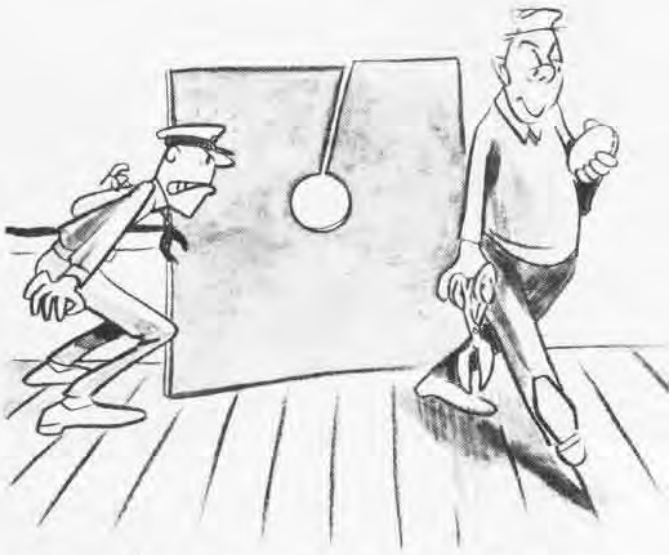
DILBERT

All of Dilbert's showmanship seemed to leave him when he was called in for flat-hatting.

Dilbert was the lad who used to peek out the back of the hood.

A good pilot always appreciates the sweat, barked skin and headaches which go to keeping one plane in the air.

Spoiler turned into Man Mountain Dean every time he saw a thread.



Spoiler's parents didn't give up their aluminum so he could waste it.

Spoiler finally understood why you safety a propeller.

Aerospace engineering majors at the Naval Academy, Annapolis, work on an experiment which shows how air pressure affects a wing to provide lift, above. Gary D. Bennett checks the wing in the wind tunnel, right. Bennett and classmates check air flow pressure gauges, opposite.

Recipe for Success

Story and Photos by JOCS Dick Benjamin

It's like throwing a lot of little parts into a huge funnel. As they get to the narrow end, everything merges and — click."

Commander Richard C. Gentz is not talking about a favorite family recipe. He is referring to how the Aerospace Engineering Department at the Naval Academy, Annapolis, prepares its aerospace engineering majors to design an aircraft.

"You must start with basic ingredients," explains the department chairman. "You have to take the students through a part at a time until they get to the point — near graduation — when all those little parts click together. That's when they say, 'Hey, that's why we did that back then.' Until they get close to the end, they can't see the whole picture. They're only looking at one small problem at a time."

In a way, it's the same as looking at that family recipe one ingredient at a time. It isn't a cake until you put it all together.

Aerospace engineering is primarily concerned with the design and analysis of vehicles which travel in the atmosphere and in space. The curriculum provides the students with a broad background and understanding of basic physical principles and engineering

Bonanza leased by the Naval Academy is used for various experiments, right. Midshipmen help Professor Utgoff load lead blocks into the aircraft, below. Information gathered from experiments is fed into a computer for analysis and later use, bottom. An unusual shot of Midshipman Dave Ewing and his project, opposite.

practices. The individual ingredients include courses in subsonic, supersonic and hypersonic aerodynamics, gas dynamics and propulsion, flight performance, stability, control and structural analysis.

The courses, then, are the many parts and the student is the funnel into which they are fed.

"A design project allows the student to use all the parts and see how they interrelate," Gentz points out. "He is putting something together that has to be aerodynamically viable; it has to be flyable, structurally safe and perform its mission. All the parts go together into an airplane design the students can then look at."

Structural analysis is a key part of the aerospace engineering program. It is actually a separate area of interest from design, but the two must go together. As the commander explains it, "You can't have design without structural analysis. In that regard, we are looking at the entire system."

Simply, this means that something must be designed so that it can, in fact, be built. It's easy to draw a slick looking airplane on the blackboard. It's something else to tell a sheetmetal worker to put it together and know it will work.

"From the students' point of view," says Gentz, "it's usually a question of their asking why not make something a little bit better or why not use more of something else. In terms of the overall system, the cost effectiveness of going any further than a certain point becomes questionable.

"When a student gets to his own design, he realizes that if he makes a wing any fancier than his basic design, which would do the mission, he can't justify the way it is put together. By doing more than is necessary, he can't analyze it properly and must return to something more simple. Anything more complicated than what is necessary can't be handled."

It isn't all textbook and classroom study in the department. Many experiments are planned for the students to conduct and then report their findings. These vary from wind-tunnel tests of air pressure over a wing to in-flight experiments in flight performance, stability and control in a *Bonanza* leased from the Beech Aircraft Corporation.

In the first experiment, a wing is placed in a wind tunnel. There are six equidistant strips around the wing and each strip has 19 holes in it. The 114

holes in the wing are connected via tubes to liquid gauges. As air passes over and under the wing, the pressure at each point is monitored and a computer program filed on the findings. The students can thus determine how air pressure affects the wing to provide lift.

In the latter experiment, lead blocks are loaded into the *Bonanza* and the aircraft's center of gravity is changed by moving the blocks to different positions. The students can determine how the aircraft's flying characteristics are affected by moving the center of gravity and how far the center can be moved before the aircraft becomes unstable. The information gathered is fed into a computer and graphic results are returned which enable the students to write their conclusions.

Associate professor Vad V. Utgoff, a retired Navy captain and aviator, is one of several faculty members who flies the *Bonanza* during the experiments. safeguards are maintained to ensure that the center of gravity is not moved beyond safe limits.

Neither is it all "controlled" experimentation and research for the students. Any midshipman in good standing enrolled in a major engineering curriculum may elect to take a course for credit in which he conducts "independent" engineering or research study. He will work under the supervision of an experienced faculty member who has a research interest in a comparable area, but generally the midshipman selects his own topic, designs his own apparatus and submits a written report of his accomplishments.

The Trident Scholar Program is also available to students. The Naval Academy instituted the program in 1963 to provide a limited number of exceptionally capable students with an opportunity to engage in independent study and research during their senior year. Under this program, midshipmen standing in the top ten percent of their class at the end of the first semester of their junior year are invited to submit proposed research projects and programs of study for evaluation. If a project is approved, the student works independently on his research and carries a reduced number of courses. His research and thesis constitute the major part of his academic program for the year. The Trident Scholar Program is similar to the Scholar of the House Program at Yale University.

Midshipmen 1/C David E. Ewing and Michael W. Moran, both selected for flight training at NAS Pensacola, Fla., are two students conducting independent research. Dave is working with Professor Utgoff to develop an augmenter ramjet engine. Mike and Dr. A. A. Pouring, the Naval Air Systems Command research professor, are developing a cloud-seeding device.

A ramjet has no moving parts and the air for oxidizing the fuel is continuously compressed by being rammed into the inlet by the high velocity of the aircraft. It normally operates only after it has initial velocity, which is a big drawback. As Dave explains his project: "Basically, we are trying to build an augmenter ramjet engine that will develop thrust at zero velocity. Ramjets are a good idea because they are very simple and don't have a lot of parts to them. The augmenter will enable the ramjet to work without having some type of booster power to get it up to speed."

"The idea is something I have been toying with for a long time," says Prof. Utgoff. "When Ewing came around looking for a project to do, I suggested this and a few others. The augmenter ramjet interested him and then I said, 'Here's the basic idea. You do all the designing, bring me a set of drawings and we'll take it from there. Your next step will be to develop a test program.' "

Once the project was explained to him, Dave began working with some basic figures the two decided to begin with, such as an inlet opening two inches long. Dave did some preliminary mechanical drawings and researched V/STOL aircraft to give him parameters to begin his final drawings. When the drawings were finished, he took them to the professor who took them to the metal shop where the augmenter was built.

"We have to make static tests without using any wings or the wind tunnel," Dave explains. "If it works out satisfactorily, we will develop a ramjet to put on the end of it. The exhaust from the augmenter will go into the ramjet and then we'll have to develop some type of flame holder. We have only a very sketchy idea on a flame holder right now. After we develop one that won't cause too much drag, build a flame lid on it and ease the speeds in the wind tunnel, then we'll build a nozzle coming off the end to exit the gas."

"That would complete the ramjet,"

Midshipman Mike Moran hooks up his cloud-seeding device for a test, below. Ewing and Utgoff check their augmenter inlet, right. The U.S. Naval Academy at Annapolis where it happens, opposite.

Utgoff points out. "The ramjet basically consists only of three parts — inlet, flame holder and exhaust nozzle. What we have now is the inlet because that is the heart of this particular design. But we do need to develop the flame holder and a tailpipe. Part of Dave's project is to do the homework to find out what size that tailpipe should be."

One of the applications of the augmenter ramjet would be as a tip drive for a helicopter rotor, which is why static thrust is needed. If the rotor isn't turning, there isn't any push.

"If we have some static thrust," Utgoff continues, "we can at least start the rotor turning and as it picks up speed, like any ramjet, we get more and more thrust and eventually speed. The augmenter ramjet would be an ultimate power supply, especially for the one-man helicopters under development. The ramjet burns a lot less fuel than rockets, and the helo would then have to carry less fuel."

In such a research project, the computer is used extensively because the equations usually become pretty involved. "The computer is particularly useful for data reduction," says Utgoff. "Data reduction is basically coolie labor and the computer can do all the coolie labor and save brain time."

Materials for projects are chosen because of their availability and machinability as well as for their ultimate purpose. For example, there was no particular reason for choosing brass for part of the augmenter except that it is easy to machine and the shop had some. The front part is aluminum which is also easy to machine and it didn't make any difference whether it would withstand high temperatures. The tailpipe, however, will have to be stainless steel to withstand the high temperatures that will be developed.

Dave decided he wanted to attend the Naval Academy when he was a freshman in high school. He has wanted to fly since the seventh grade.

"I don't know why," he says, "I just do. I think I got it from TV movies, really. I wanted to be a carrier pilot and the Naval Academy is the only service academy I would have gone to. My brother-in-law graduated from here in 1966 and that helped things along and made me want to come here even more.

"I didn't make it the first time I tried, right out of high school. I had to go to prep school for a year and that makes the success of my being here even more meaningful. Aerospace is something I have always been interested in. I wanted to fly. Flying is cool and I wanted to learn about something I wanted to do for the rest of my life, which is why I'm majoring in aerospace engineering. I think it will help me when I get to Pensacola. Most of what I've studied here will help me with the academics during flight training and it never hurts to know

exactly how your aircraft works.

"As far as the ramjet project goes, I wanted to get away from the books a little and do more practical work instead of just theory. I want to be a jet pilot — I'd like a shot at the F-14 if I can get it. I would like to go to test pilot school and, of course, I think just about every aviator would like to be a *Blue Angel*. Later on, if the opportunity presented itself to become an astronaut, I'd like to try that."

Mike Moran signed up for a research program last spring. He wasn't quite sure what he wanted to do, but he was interested in gas dynamics. His advisor, Dr. Pouring, had as a pet project a cloud-seeding device: supersonic expansion of vapors to condense the vapors and make cloud-seeding particles. It was easy for Mike to get involved with it.

"We put together a device which is basically a metal cylinder filled with a cloud-seeding material," relates Moran. "We are presently using silver iodide which is very conventional and is a standard of comparison. We pressurize the chamber and heat the bottom with a regular hot plate to a temperature at which the silver iodide starts to vaporize. The chamber is pressurized with nitrogen gas and a vapor of nitrogen and silver iodide is formed. The vapor flows through a small orifice — a pinhole — and expands supersonically into the atmosphere where the particles condense.

"The experiment is designed to compare various temperatures, pressures and parameters to generate particles of various sizes. Of course, various particle sizes can be used in cloud seeding for various types of atmospheric conditions to get the desired effects, such as fog dispersal or rainmaking. Basically, it's a weather modification device and, although it is not connected with project *Stormfury*, it's something they could utilize if the program is started again. And, hopefully, it will be better than the devices they were using.

"We know the project works. The thing now is to determine how to operate it. Particle size and uniformity are very important in weather modification and our task now is to determine operating parameters for various tasks. For instance, if you want to disperse fog and it is 45 degrees outside, at what pressure and temperature do you operate the device to get the particles that will do the trick?

"Hopefully, I'll soon be able to use a laser for light-scattering experiments. In these, I will shine the laser down the gas jet and take a side picture which will allow us to determine particle density. We also want to capture particles on microscope slides. With these and the photographs, we can determine particle sizes and uniformity.

"I understand they are doing a lot of weather modification work at China Lake, but I don't know if they are into this particular aspect of it. It's a principle a lot of people know about and have done research in, but no one has developed a practical device yet. That is what we are working on.

"Right now our device isn't too practical but it will help to determine at what temperatures and pressures you need to operate one so a device can be designed that can be mounted in an aircraft. I hope to design a better device this semester."

Mike has wanted to get into aerospace engineering for over 15 years. His family lived in Florida in the late 1950s when the U.S. found itself deep in a space program. He relates that he and his younger brother would camp on the beach near Cape Canaveral and watch the *Mercury* space launches. He began building model rockets during junior high school in Arizona and his interest in aerospace engineering grew throughout high school. As does Dave, Mike leans toward jets and test pilot school.

He is also interested in a missile guidance system that uses ram air to control the missile's path. Air entering the nose of the missile would exit through pores in the side, deflecting and controlling the missile. "I built a model rocket with that type of guidance during my senior year of high school," he says. "It worked, but it wasn't very efficient. I would like to get into it this semester, but I don't know if I will have time."

Transparent engine, with ignition, spark and piston movement, helps midshipmen understand how it really works, right. Reed B. Kennedy uses a calculator to solve an equational problem, far right. Bennett and AMS2 Ken Crabtree take a spin in the air cushion vehicle, bottom. Bennett is working on a project to improve the steering capabilities of such craft.

Ewing and Moran are not the only aerospace engineering majors headed for flight training. Many of their classmates will be going with them. In recent years, about half of the 40 to 50 graduates with majors in this area have gone to Pensacola. The other 50 percent went into other branches of the Navy, but the broad range of topics covered in the department's curriculum permits graduates to feel at home in any technical area. Throughout the Navy, there are missiles, hydrofoils, surface effect ships, satellites, control systems of ships with reduced manning on the bridge, gas turbine propulsion. . . . The overall need for officers with an aerospace engineering background is constantly expanding into more areas.

A graduating aerospace engineering major also has an excellent opportunity to pursue an advanced degree. He may attend the Naval Postgraduate School at Monterey, Calif., under the Navy-sponsored Immediate Graduate Education Program.

Receipt of a Guggenheim Fellowship would allow him to attend Columbia University, Princeton University or California Institute of Technology. During the past six years, 69 students have taken advantage of this opportunity and have received their advanced degrees. Those who do not choose, or feel qualified, to continue their education upon graduation from the Academy still have opportunities for an advanced degree later.

Aerospace engineering laboratory facilities at the Academy are designed primarily to support aerodynamics (including propulsion), structures and performance.

In the aerodynamics laboratory are two industry-size subsonic wind tunnels with force and moment measuring and flow visualization capabilities; small subsonic tunnels, one of which has been modified to test rotors while the others are small enough for classroom use; a whirl stand for studying rotary-wing aerodynamics; a demonstration-size supersonic wind tunnel; a shock tube; and various aerospace propulsion devices. With these, the engineer may obtain or verify calculated information on aerodynamic forces, moments and thrust-producing devices.

The structures laboratory has been designed to test the material and configuration properties of all common aerospace structures. The instrumentation allows the user to duplicate a wide range of aerodynamic and static loadings. These loadings, provided by aerodynamicists and propulsion engineers, are used to assess the merits of the structural engineer's choice of material and geometry and to predict how well his choice will perform its task.

The performance laboratory consists of the *Bonanza* and a small air-cushion vehicle. The air-cushion vehicle is used by midshipmen and faculty to conduct tests and experiments in aeronautical aspects of marine vehicle technology. With these two vehicles, the sum of information provided through aerodynamic, propulsion and structural analysis may be integrated with stability and control considerations to demonstrate what a total aerospace vehicle will do and how well it will perform.

Data gathering, processing and display are greatly facilitated through computer-based systems that allow the user to reduce his data and receive a finished graphic result in the most efficient manner.

A construction and modernization program under way includes a new engineering complex which will provide 176,000 square feet of offices, classrooms, shops and laboratories. About 20,000 square feet will be for aerospace engineering laboratories to support instructional programs in aerodynamics, propulsion, structures, flight dynamics and flight simulation.

How does an aerospace engineering background help a student going into flight training?

"In ground school subjects he should have more knowledge of the things he is going to cover," says Gentz. "But I don't think he gains a great deal of advantage as far as the basics of being able to fly an aircraft are concerned. The real benefits come after he gets to a squadron and is learning to become a competent fleet aviator. He has an aerospace degree and pilot's wings which he can put together and use to great advantage.

"He can talk to the fleet tech reps in their terms and is better able to talk to the maintenance people in the squadron. As a squadron maintenance officer, he will be able to understand the aircraft's entire weapons system and understand the technicians when they say they have a problem. He will know how critical a problem is and how to handle it.

"When he leaves the squadron and goes ashore, he really should be ready to use his two talents together. His recent fleet operational experience could then be plowed back to the shore activity that is designing a new system or thinking about the next follow-on program. He will know what mistakes were made before and what the most logical follow-on program might be.

"He will be able to use his recent fleet experience and aerospace engineering background while working with engineers at such places as the Naval Air Systems Command, the Naval Air Test Center and the Naval Air Development Center. The civilian engineer who is versed in the latest technology and the fleet aviator who has an aerospace engineering background have a better opportunity to meet the Navy's needs."

Together they can bake any cake.

Letters

Exchange Pilots' Reunion

In recent years, we have had many members of the U.S. Navy on exchange with our squadron [849 Naval Air Squadron, RAF Lossiemouth]. It is intended to have a reunion of as many people as possible, including exchange officers and their wives, who served in the squadron.

As I have no way of knowing the location of many of these officers now, I should be deeply indebted if you would place the following in your publication.

The reunion is planned for the weekend of either the 23rd or 30th of March at the squadron. Further information may be obtained by writing to Lt. J. T. Lang, RN, 849 Naval Air Squadron, RAF Lossiemouth, Morayshire, Scotland.

Insignia

The "Naval Air Coats of Arms" article in the November issue showing the firstest and latest Navy insignia was very interesting.

I'm donating an old (inherited) album photo of another firstest — Barney Google and his horse Spark Plug. Anyone know the plane and unit?

Keep up the interesting work (for Navy's posterity).

E. T. Evans
4832 Fairfax Drive
Arlington, Va. 22203

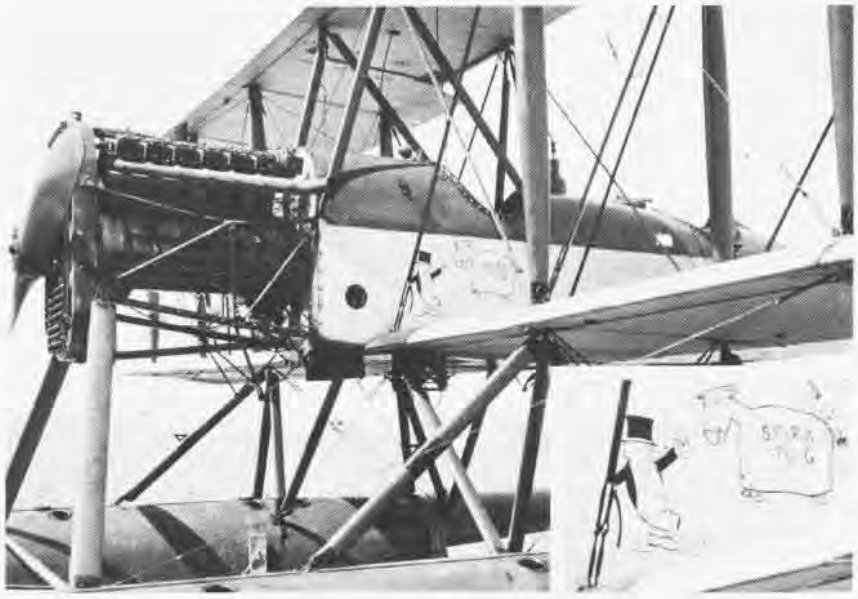
Photographs

Naval Aviation News receives numerous requests for photographs. Unfortunately, we do not have the resources to honor these requests. Should you desire photographs, please contact the following organizations as appropriate:

Audio-Visual Archives Division, National Archives, Washington, D.C., maintains most official Navy photography taken prior to January 1, 1958. Located on Pennsylvania Avenue at Seventh Street N.W., it is open to the public on weekdays from 9 a.m. to 5 p.m. Telephone: (202) 962-2513. Black and white prints, 8x10, glossy or matte, are $2.25, with varying prices for other sizes, negatives and color prints. Check or money order, payable to General Services Administration (NNV), must accompany orders.

The Naval Photographic Center, Still Picture Department, Washington, D.C. 20374, maintains official Navy photography after January 1, 1958. Its facilities are open to the public from 8 a.m. to 3 p.m. on weekdays. Appointments are desirable. Telephone (202) 433-2168. Black and white prints, 8x10, are $1.25 for glossy and $1.75 for matte, with varying prices for other sizes. Check or money order payable to Naval Photographic Center must accompany all orders. (There is no charge for Navy/Marine units requesting photographs for official business purposes.)

When requesting a photograph, be as specific as possible concerning the publication in which you saw it, names, dates, places and other aspects of the views desired. Order by the negative number, if possible. Color photographs include the letters K or KN as part of their negative numbers. All others are black and white.



J. Gosling

I have just read the article "Naval Air Coats of Arms" in the November 1973 issue of *NANews* and enjoyed it very much. It certainly is good news to hear that at last units are getting away from insignias full of gears, wrenches and lightning bolts and going to clear, bold designs that are distinguishable from a distance.

While searching through some old records, I came across a publication produced by the Office of Public Relations, Naval Air Training Center, Pensacola, Fla., dated February 1944. In this was the well-known Pensacola insignia with the following comment: J. Gosling, well-known Pensacola mascot, is the product

of the imagination of Ltjg. Eddie Collins, USNR, formerly an associate radio engineer of the assembly and repair department. The character dates from October 4, 1931. While J. and Donald Duck look and act a great deal alike, J. is the older of the two. I had thought this insignia dated back a little earlier than 1931 and perhaps some reader might have additional information on this early insignia.

John M. Elliott, Maj., USMC (Ret.)
Chief, Collections Branch
National Armed Forces
Museum Advisory Board
Smithsonian Institution
Washington, D.C. 20560

License Plates

I am a collector of military license plates from around the world. I have my collection almost complete, except for plates from the Azores, Turkey, Greece and Korea. All my plates are for civilian cars of U.S. Forces.

If any of your readers have these plates, I would be glad to pay the postage if they would send them to me.

Thomas M. Lindenberg
975 N. Shore Drive
Benton Harbor, Mich. 49022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