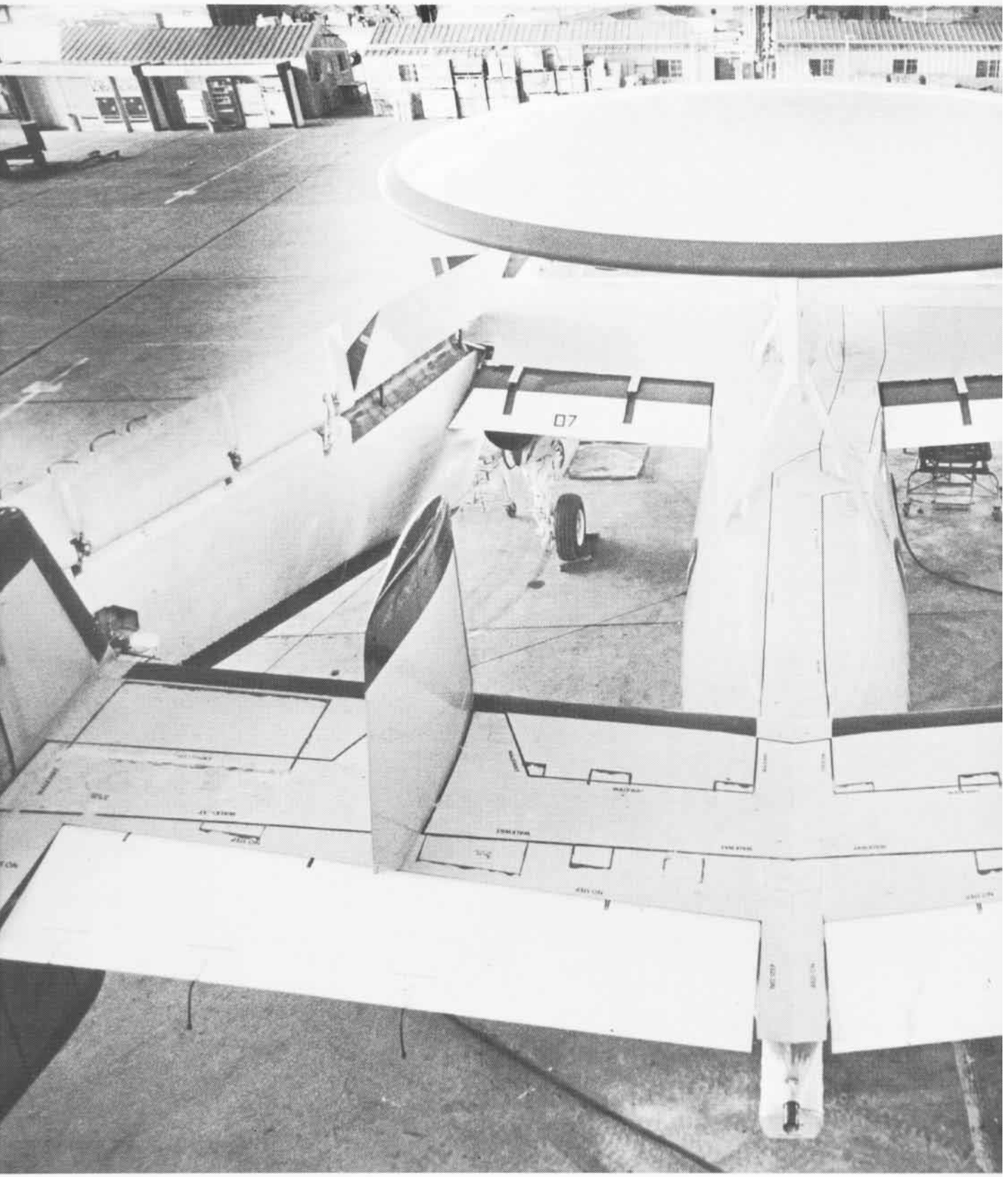
NAVAL AVIATION NEWS

NOVEMBER 1974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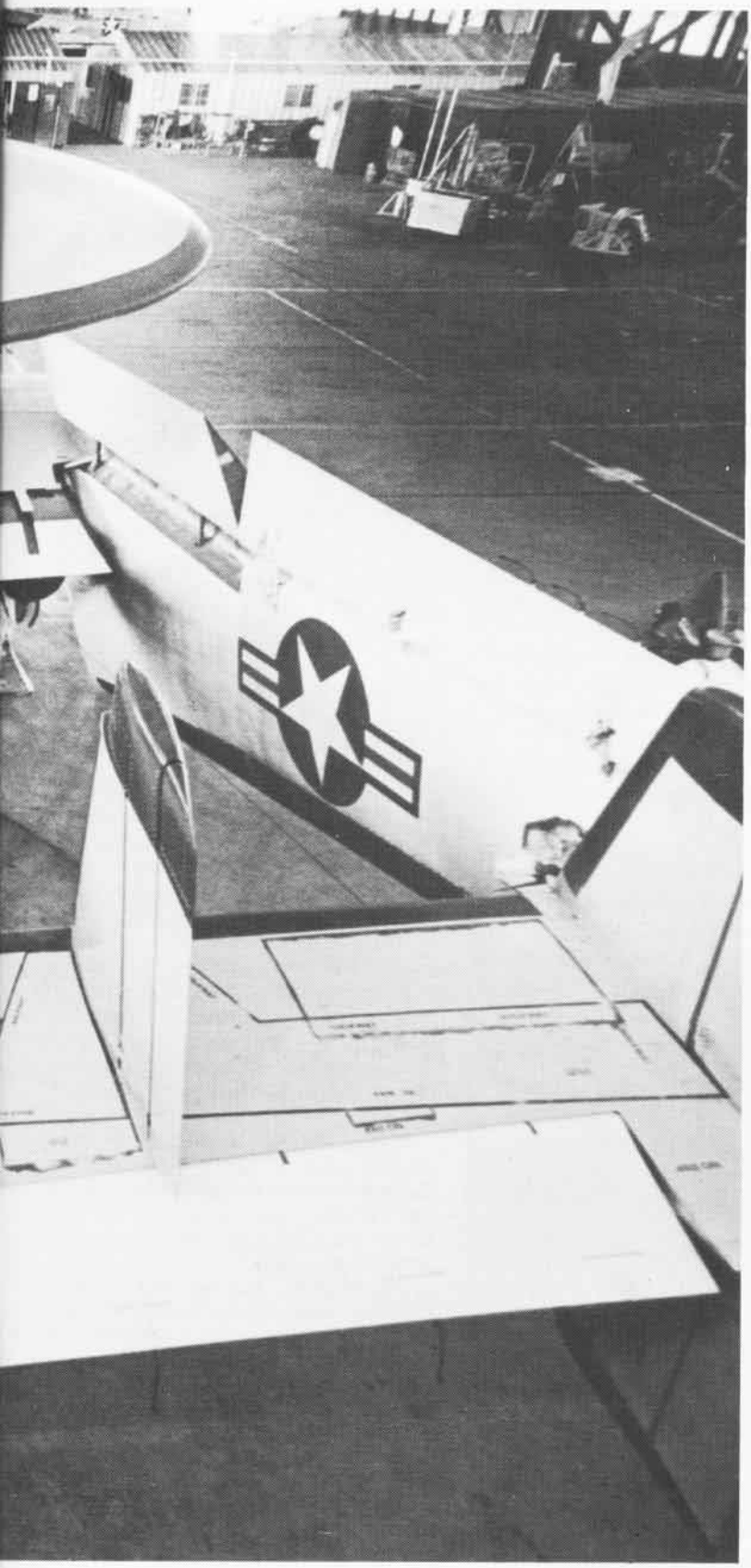

NAVAL AVIATION NEWS

FIFTY-SIXTH YEAR OF PUBLICATION

THE STAFF

Covers – *On the front cover a VF-1 Tomcat is caught in a climb by the camera of PHCS(AC) Robert L. Lawson. Left, JOCS Dick Benjamin photographed this RVAW-120 E-2C Hawkeye in the squadron's hangar at NAS Norfolk. PH2 Teddy Yee's mood shot of USS Ranger (CVA-61), back cover, was made in Victoria Harbor, Hong Kong.*

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Letters

Safety First

I have just finished reading the August issue of *Naval Aviation News* and have this comment to make. On page 19 is a picture of an A-7 which has just landed, showing an exceptional number of personnel hugging the foul deck line. Shouldn't this picture be reprinted with an appropriate caption to call flight deck personnel's attention to what happened on Constellation in 1963 or 64 when a cable parted.

W. D. Keener, Lt.
Flight Test
NATC Patuxent River, Md. 20670

Kudos

One of the Laboratory's routing copies of the July 1974 issue of *NANews* just crossed my desk. No doubt about it, this is one of the best issues I've seen in the several years that I've been reading *NANews*. And I've been noticing your progressive improvements over the past year or two.

Being intensely involved in NOL's publications program, I like to think that I know what good is. *NANews* is good. It is of great benefit to me because you provide me with numerous publication ideas while setting high professional standards at the same time.

I'm simply overwhelmed by the "Carrier C.O. at Sea" article. If you've got any extra copies available, I certainly would like to have one for personal reference. This particular issue provides an extra measure of editorial, photojournalistic and managerial inspiration.

I sincerely hope you can find someone to follow in Robert Hensley's footsteps. All pubs groups should have people of his calibre.

Many thanks for a great publication.

Timothy D. Calderwood
Publications Division
Naval Ordnance Laboratory, White Oak
Silver Spring, Md. 20920

NAS Pasco

From late 1944 to 1946 I was stationed at NAS Pasco, Wash. On my vacation this year, I undertook a sentimental journey. When I drove out on the old highway to Vancouver, I was surprised to see all of the station intact – with the exception of the enlisted men's barracks.

I took some pictures and I thought it would be a good idea if some of them were run in one of your issues. I know there was a lot of flying done at that station and it might make good reading for some of the men who were stationed there. I myself have never lost touch with the Navy, having been recalled during the Korean War and also being a part of the Ready Reserve.

I made some notations on the back of the pictures. If any are printed, I would appreciate it, and hope some of my old buddies will get in touch with me. The station was closed in 1946 shortly after I left.

L. Puglia
36 Emerson St.
Wakefield, Mass. 01880

Ed's note: Mr. Puglia also remembers standing the tower watch the day an atomic bomb was airlifted from Pasco. The reason for soldiers armed with submachine guns on the scene, was explained after the fact. Following his release from captivity, General J. M. Wainwright visited the base and inspected the Richland, Wash., plant where work on the bomb took place.

Berlin Airlift

I have been commissioned by my publishers, *The Reader's Digest Press*, to prepare a narrative account of the Berlin Airlift and Blockade of 1948/49. I will be grateful for any help.

For the historical record, I am anxious to hear from veterans who may have participated in any capacity.

Richard Collier
John Cushman Associates Inc.
25 West 43rd Street
New York, N.Y. 10036

Naval Aviation Films

The following motion picture films are among the latest released by the Film Distribution Division, U.S. Naval Photographic Center.

MN-11335A (unclassified) *Rebuilding High-Speed/High-Performance Naval Aircraft Tires – Rebuilding Naval Aircraft Tires.* The high standards required for new tire construction and tire rebuilding (30 minutes).

MN-11375 (unclassified) *Accident on the Way to Happening.* An aircraft accident resulting from a number of human errors occurring in a chain of interacting events which could have been prevented by exercise of leadership from supervisory personnel (21 minutes).

MN-11389 (unclassified) *Tactical Employment of the OV-10 Bronco.* Tactical capabilities and utilization of the OV-10A with emphasis on airborne coordination and supporting arms (22 minutes).

MN-11092B (unclassified) *Lightning and Precipitation Static – Causes and Effects on Aircraft – Damage and Protection* (15 minutes).

MN-11030 (unclassified) *EA-6B High Angle of Attack Flight Characteristics.* How to correct from high angle spin conditions in the EA-6B (22 minutes).

Instructions for obtaining prints of newly released films are contained in OpNav Instruction 1551.1E.

did you know?

Awards

The Chief of Naval Operations, in announcing the winners of the Annual CNO Safety Awards, extended "Congratulations and well done to the winners. . . ." This recognition is the hallmark indicative of dynamic and inspired leadership, esprit de corps and professionalism. These squadrons have clearly demonstrated that safe as well as effective operations are compatible. Maintaining these high standards is an unrelenting task and a great tribute to all hands involved."

This year's winners are: NavAirLant – VF-74, VAs 82 and 42, RVAH-6, VP-30, VS-24, VAW-124, HS-5, VRF-31/VR-1, VF-101 Det Key West, HC-6; NavAirPac – VF-143, VAs 95, 122 and 215, VP-50, HSL-33, VAQ-133, VS-37, VAW-111, VC-7, VX-5; FMFLant – HMM-261, VMO-1, VMGR-252, VMFA-312; FMFPac – VMAT-102, HMT-301, VMO-2, VMA-211, VMFA-115; CNATra – VTs 2, 21, 26, 29, HT-8; NavAiResFor – VA-304, VS-81, VR-53 Memphis, VF-301, VP-68, HS-74; MARTC – VMF-351 and HMM-764.

Repeat winners were VP-24, VRF-31, HC-6, VF-143, HMM-261, VMGR-252, VMAT-102 and HS-74.

Earlier CNO had announced the 1974 Admiral Flatley Memorial Awards and the FY-74 Readiness Through Safety Award.

Flatley Awards went to *Forrestal* (CVA-59), *Coral Sea* (CVA-43) and *Iwo Jima* (LPH-2) as winners in CVA (Group I), CVA (Group II) and LPH (Group III), respectively. It was a repeat for *Forrestal*.

The Readiness Through Safety Award went to the Naval Air Training Command. Runners-up were NavAirPac and FMFLant. The winner achieved a 29 percent improvement in its accident rate during the year.

South for Summer

Naval Aviation units participating in the South American exercise *Unitas* XV from August to December include two antisubmarine patrol aircraft from VP-26, Brunswick, Maine; a transport from Fleet Tactical Support Squadron 52, Detroit, Mich; an SH-2 Lamps helicopter detachment from Fleet Helicopter Sea Control Wing One; and a drone detachment from Fleet Tactical Support Squadron Six, Norfolk, Va.

Tunnel to Tomorrow

A design study contract has been awarded which could make the world's largest wind tunnel at NASA's Ames Research Center, Mountain View, Calif., bigger and quieter. The modified wind tunnel would permit full-scale testing for aircraft of the future.

A new test section would measure 80 by 120 feet and the speed capability in the original test section would be increased from 230 to 345 miles per hour.

The new tunnel is needed for testing new aircraft which would be able to operate quietly and efficiently from smaller airports. The two test sections would permit full-scale testing of all fighter and attack aircraft, small to medium transports and tactical utility rotorcraft.

The modifications include repowering the facility from 36,000 to 135,000 horsepower. The design-study phase of the program is expected to last two years.

The tunnel is presently powered by six 6,000-horsepower electric motors which drive six 40-foot diameter, six-bladed wooden propellers. It has been an important element in the development of sweptwing technology, improvement of high lift devices and boundary layer control research.

did you know?

Super Stallion On August 10, the Sikorsky Aircraft YCH-53E prototype No. 1 flew in a hover at a gross weight of 71,700 pounds. It carried an external load of 17.8 tons and hovered at a wheel height of 50 feet.

In another flight, the YCH-53 flew at 170 knots (195 mph) at a gross weight of 56,000 pounds, which exceeded by 9,500 pounds the specification gross weight of 46,500 pounds for that speed.

Sikorsky has built two prototypes of the *Super Stallion* and reports that the new helos have exceptionally high mechanical reliability for aircraft in this early stage of the flight test program.

The three-engine 53E is a growth version of the twin-turbine CH-53.

Big Bag The world's largest unmanned balloon was successfully launched on August 5 from Fort Churchill, Manitoba, Canada, on the shores of Hudson Bay.

The flight, sponsored by the Office of Naval Research and NASA's Office of Space Science, used the facilities of Navy's *Skyhook* program, the oldest active scientific balloon program.

The balloon lifted an 800-pound instrument package containing a magnet, spark chamber and counter system (to measure positron and electron spectra between 10 and 800 million electron volts) to an altitude of 155,000 feet.

The entire flight train (balloon, experiment package and parachute) was 835 feet long and weighed 4,300 pounds. The balloon, made of half-mil polyethylene film, had a volume of 50.3 million cubic feet, a diameter of almost one tenth of a mile and weighed 3,000 pounds.

As it rose to float altitude, it assumed a fully inflated form 512 feet in

diameter and moved 500 miles west toward Lake Athabasca. It was tracked by Project *Skyhook's* DC-3.

After 18 hours, helium was allowed to escape in order to lower it to 100,000 feet where the atmosphere is dense enough to support a parachute descent. The scientific package and parachute were then separated from the balloon by radio command. That same action split the balloon from top to bottom and the balloon material descended to earth thus removing any hazard to air navigation.

Mini-RVP

Teledyne Ryan Aeronautical has introduced a mini-remotely piloted vehicle. The delta-shaped, ducted-propeller-driven vehicle completely fueled will weigh between 120 and 140 pounds, depending on its mission, and will be the smallest of Teledyne's RPVs.

It has a multimission design capable of providing, in addition to target acquisition and designation functions, a flexible range of surveillance, reconnaissance, weapons delivery and electronic intelligence gathering applications.

While launch and recovery operations for many applications will use rail launch and net recovery, other versions could use conventional landing gear.

GRAMPAW PETTIBONE

Night Belly Whopper

A lieutenant commander instructor pilot and his ensign replacement pilot (RP) briefed for the new pilot's first night training flight in an E-2 *Hawkeye*. A complete brief was conducted, the aircraft was signed for and preflight performed. The *Hawkeye* launched from home plate and proceeded to a nearby airfield. The RP was in the left seat and the instructor pilot was occupying the right seat.

Nearing the vicinity of the airfield, a TACAN approach was conducted. Following the approach, the E-2 was cleared into the night VFR landing pattern. Eleven approaches were flown with various flap configurations: full, two-thirds, one-third and no flaps. Of these, eight were terminated with touch-and-go landings.

Approximately one hour after takeoff and still in the pattern, the aircraft reported the abeam position with three down and locked for a touch-and-go with the port engine simulated out. This pass was completed as a simulated single-engine landing with a takeoff using power on both engines.

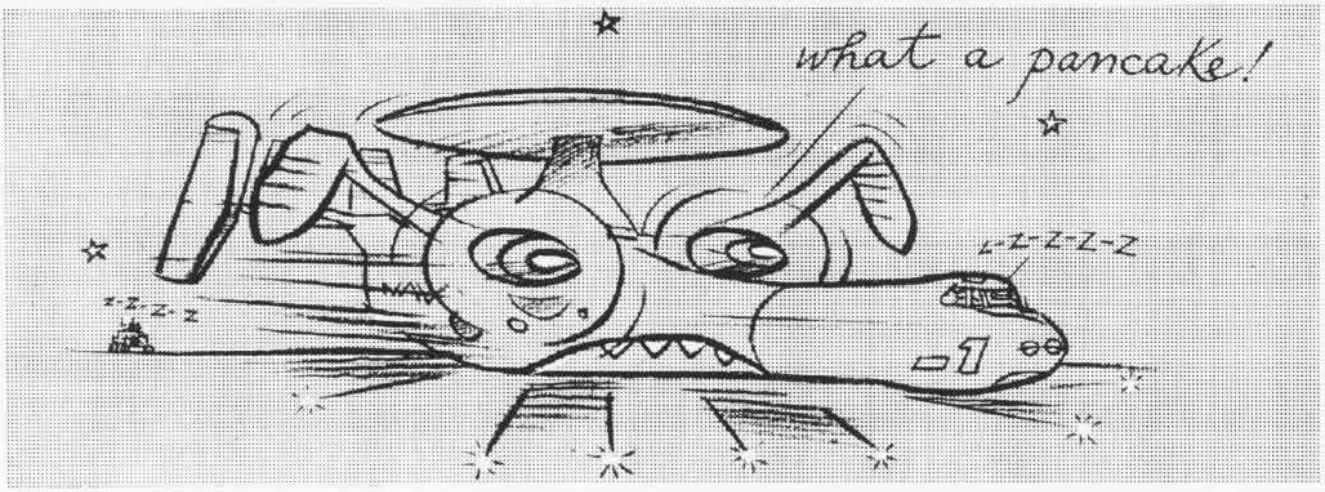
Following this approach another

single-engine approach was flown to a touch-and-go landing, and liftoff was accomplished with one engine simulated feathered to emulate a single-engine bolter. (The procedures for a single-engine waveoff or bolter are identical.) After performing the proper procedures, a single-engine climb was accomplished and the E-2 commenced a turn downwind for another simulated single-engine approach. Abeam the runway, the E-2 reported "Three down and locked, touch-and-go."

During the approach, both pilots were distracted by an F-4 in the pattern, also conducting touch-and-go operations. The single-engine approach was flown fast and the instructor commented that the aircraft tended to float in close. As the *Hawkeye* approached the touchdown point, the instructor added power to the starboard engine (simulated feathered) and told the RP, "Take both engines and let's go."

Immediately an explosion was noted on the starboard engine. The RP reacted by reducing power in order to keep the aircraft on the runway. The starboard propeller contacted the runway, followed immediately by the port propeller. The aircraft had landed *gear up* on the center line, approximately 2,500 feet down the runway, and departed it to the left.

The plane finally came to a stop, left of the runway, a little past midfield. The starboard side of the aircraft was in flames as the pilots exited via the overhead hatches. The aircraft sustained substantial damage. The instructor suffered minor burns on his hand. He wasn't wearing flight gloves!



ILLUSTRATED BY Oplom

Grampaw Pettibone says:

My achin' ulcers! With all the emphasis on safety and NATOPS in this day and age, we still have those few drivers who don't listen! There are a multitude of excuses (I was distracted by the F-4, etc.) but no new ones.

Would you believe that we had a wheels watch posted in this case? He was worse than the pilots. He saw the machine with the wheels up but never fired his flare gun.

I've said it at least 100 times in the past 32 years: Use the checklist! It provides an "aircraft-back guarantee." And it's free!

Nostalgia

Several instructors were parked at an outlying field, talking to their students. The first instructor to take off climbed steeply, then turned and dove at the other planes. This "hot pilot" evidently got a thrill out of seeing everyone duck as he missed them by only a few feet.

He pulled up steeply after the first pass, made a flipper turn and started down again. This time something went wrong, however—either in the turn or in the dive. Whatever the cause, he was still nose down when he hit at high speed. Fortunately, he missed his pals.

Grampaw Pettibone says:

One irresponsible act cost this pilot his life. Many pilots are killed in similar, idiotic low-altitude maneuvers. You might try to pass it off by saying that anyone who pulls a crazy stunt like that rates what he gets, but that isn't enough. From an entirely impersonal point of view, this country just can't afford this waste of personnel and material, either in war or peace.

In the present stage of aviation development, some training and operational losses are inevitable. They are only justified by the greater good obtained in training and operations. The attrition which results from unauthorized low-altitude maneuvers, however, has no justification whatever and, therefore, must be eliminated.

As I've often said before, it's worse for instructors to flathat than anyone else. That may seem unfair, but that's the way it is, because instructors involuntarily set the standard for their students. If students see their instructors do these things whenever they get away from official observation, students will get the idea that this is the accepted practice.

Lest some pilots already have the wrong idea, let me give you the inside dope—flathatting is definitely not the accepted practice. You may get away with it for a while in isolated cases, but not for long. And death isn't the only punishment you face. Courts-martial, kick-outs, heavy fines, loss of wings and even commissions all help weed out the offenders.

For those who don't see their moral responsibility in this matter, don't say I didn't warn you. (April 1945)

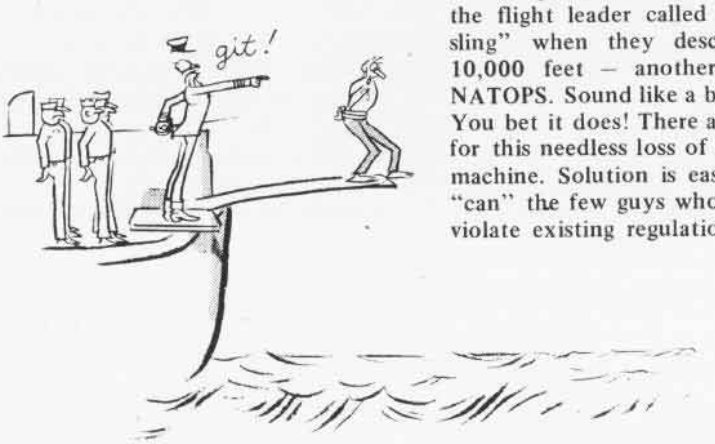
The Violator

Two F-4 *Phantoms* launched on a training flight involving visual identification of various simulated targets. This was the second flight of the day for both crews. The takeoff and climb to altitude were uneventful. Upon completion of the identification portion of the mission, the two F-4s joined for some basic aircraft maneuvers (BAMs).

They conducted various BAMs with the flight leader acting as interceptor and the wingman functioning as bogey. During one of these maneuvers, the flight leader informed the crew of the other *Phantom* that the next pass would be an extension to a pitch back. Neither crew member in the bogey F-4 sighted the intercepting aircraft making the initial pass.

The intercepting F-4 then made a nose-low turn from 20,000 feet to a position level with the bogey which was at 16,000 feet and approximately two miles in trail. At this time the wingman, still acting as the bogey, called "Tallyho! I'm gonna extend." The bogey extended for a short period and then executed a slice turn to the left. The flight leader maneuvered to the outside of the wingman's turn and rolled out high at three o'clock. He estimated his wingman to be 5,000 feet below him and at an airspeed in excess of 500 knots. The wingman then rolled left and started what appeared to be a second nose-low turn. The flight leader broadcast "Watch your altitude" and looked in the cockpit to note his altimeter at 11,000 feet.

He then re-acquired the wingman's F-4 just before the aircraft impacted the water. The aircraft attitude at impact appeared to be 60 degrees nose-down, with 60 degrees angle of bank in a right-hand turn. No canopy separation or other evidence of attempted ejection was observed. Due to the water depth, the aircraft and crew members were not recovered.



Grampaw Pettibone says:

Great balls of fire! I can't believe it! The flight leader allowed and participated in unbriefed maneuvers – in violation of NATOPS. Additionally, neither the wingman nor the flight leader called off the "hassling" when they descended below 10,000 feet – another violation of NATOPS. Sound like a broken record? You bet it does! There ain't no excuse for this needless loss of life and flyin' machine. Solution is easy – let's just "can" the few guys who *intentionally* violate existing regulations! Nuff sed!

E-2C HAWKEYE

SENTINEL IN THE SKY

Story by Bob Moore

Photos by JOCS Dick Benjamin

In the 33 years since the surprise attack on Pearl Harbor, the U.S. Navy has scrambled after an effective airborne early warning (AEW) system to detect distant low-flying enemy aircraft.

Dirigibles were the first AEW platforms, followed by planes like the EA-1E *Skyraider,* EC-121 *Super Constellation,* E-1B *Tracer* and the finest pedigree of all, the E-2 *Hawkeye* – A, B and C.

Before AEW, low-flying, high-speed aircraft could attack the fleet without detection, since shipboard radar cannot see over the horizon. The first AEW data transmissions were by voice. Intercepts were severely limited. There was poor detection over sea and none over land.

Now, one E-2C can track all the air traffic between Boston and Washington, D.C.

The *Hawkeye,* built by Grumman, was the first airborne tactical data system designed for carrier operations, with advanced radar, automatic computer and better communications. The E-2A and B advanced the state of the art with onboard sensors, gathering facts to store in their computers. These facts were available automatically or on request.

As carrier-based command posts, the E-2s could direct friendly aircraft and pinpoint enemy planes far away from the fleet. Linked with the fleet task force tactical data system, the early *Hawkeye* projected the "big picture" during the Vietnam War.

There were 59 *Hawkeyes* delivered to the Navy in 1967. But it soon became evident that the plane needed more flexibility. The Charlie model was first funded for development in May 1968. At the same time, the special purpose computer on the E-2A was being replaced with a general unit and the drum memory was replaced by programmable add-on core memories. These modified E-2As were designated E-2Bs in December 1971.

Last April, Grumman's *Plane News* reported: "The E-2C has passed numerous significant milestones, including all varieties of Navy evaluations, various inflight navigation tests, many reliability and maintainability evaluations, and the first successful test flight of a production plane of the E-2C vintage."

Whereas its predecessor was limited to overwater detection, the newest *Hawkeye* can detect and track enemy aircraft, ships and missiles over land and water. Its detection sensors and new, direct, ultra high frequency tie-ins to fighter autopilots can command and control destruction of launch sites with A-6A and A-7 aircraft and intercept launched threats with the F-4 and F-14.

The E-2C carries five crewmen: a pilot and copilot forward, and a combat information center officer, an air control officer and a flight technician in the fully pressurized cabin. Although another officer can substitute for the flight technician, the latter functions as a master repairman for the sophisticated electronic gear.

The *Hawkeye* team can identify and classify radar emissions to correlate passive detection information and other electronic countermeasures for target classification. This data is transmitted by a new, secure data link to the carrier task force commander for display and decision.

The airborne combat information center (CIC) within the *Hawkeye* serves as the intermediate station in the communications link between the

Ten thousand pounds of densely packed avionics equipment gives the Navy its first overland detection and tracking capability. The E-2C's passive detection system can identify targets within three million cubic nautical miles while operating surreptitiously —electronically "unseen."

carrier task force and the deployed fighter/bombers. The CIC in the *Hawkeye* receives threat and combat situation information from the data-link-controlled fighter/bombers as well as from its own radar and IFF sensors. This up-to-the-second tactical picture is relayed to the task force commander who uses it to issue retaliation, encounter and strike commands.

The commander's decisions are instantly transmitted via data link to the *Hawkeye,* where they are processed and displayed in CIC. The *Hawkeye* then uses its tactical data system to relay computerized mission directions to the appropriate fighter/bomber. During the assigned flight, instructions are constantly updated.

The *Hawkeye* is capable of controlling three air wing squadrons on one-way data link, and one squadron using two-way data link.

Its radar can detect and track over 300 targets, simultaneously keeping a computer file on course, altitude and speed of each. Flying at 30,000 feet, the *Hawkeye's* search radius reaches more than 200 miles to detect airborne targets against a background of radar reflections.

The E-2C also helps the fleet with strike force control, air traffic control, data relay, search and rescue and antisubmarine warfare.

Used for strike force control, the *Hawkeye* vectors aircraft, around ground defenses and hazards, to

Far left, RVAW-120 flew the E-2C's predecessors: E-2As and E-1Bs. Left, LCdr. Rueff is a RVAW-120 pilot. He flies with the crew, below, a flight technician, an air control officer and a combat information officer.

targets under all-weather conditions. In all-weather traffic control, the *Hawkeye* guides aircraft through precise corridors to avoid collisions while providing air-to-air rendezvous and landing sequences.

The E-2C can also relay radio messages from the carrier to distant points and, by monitoring all carrier planes, vector a rescue aircraft to a bailout or crash-landing spot for search and rescue. (*NANews,* March 1974, p. 5).

By marking and tracking buoy fields and decoy locations, the E-2C can be used in ASW command and control.

This newest *Hawkeye* utilizes the proven airframe of its predecessors but includes a completely new detection system and a multisensor target correlation capability. Its engines each develop 450 more horsepower.

The familiar rotodome still rises high on aerodynamically flared mounts. However, the nose is longer and a new topside air scoop feeds the advanced cooling system.

But it's what's inside that counts. The E-2C is the only operational U.S. aircraft designed expressly as a complete all-weather, carrier or land-based air defense system.

It can maintain a combat barrier for more than four hours. Flying at its normal operational altitude, the E-2C covers 360 degrees in a cylindrical pattern — a surveillance area of over three million cubic miles.

With its unique height-finding capability, its system can determine a target's altitude, range, bearing and velocity.

A typical AEW mission begins with a preflight checkout of all systems. An inflight performance monitor, incorporated in the aircraft and its electronic equipment, constantly monitors system performance and automatically assists in isolating malfunctioning gear.

When all systems are go, the required data is entered into the computer: geographic registration, track block numbers or new weapons information.

With the preflight checkout completed, the E-2C proceeds to an assigned station where the operator

selects the appropriate scope expansion for maximum range target detection.

On station, the *Hawkeye* is assigned two F-14 interceptors for combat air patrol. The air control officer establishes communications with the interceptors. The aircraft carrier CIC is contacted by voice and automatic data link.

When the search radar detects a target, the system evaluates the track and designates it "unknown." An unknown track symbol appears on the main display unit with the velocity vector indicating the direction and approximate speed.

To recover and display computer data on a target, the operator "hooks" the desired symbol with his light pen, a specially designed marking device. Computed speed, direction, position, altitude, track number and IFF codes appear on the top half of a five-inch auxiliary display unit. Readout is alphanumeric.

The lower half of the display is etched in a 4x4 legend matrix which corresponds to an identical switching matrix to the left, which calls up additional information.

With the velocity vector of the target indicating an inbound heading, the operator hooks the unknown and assigns it to one of the F-14s for a computer-controlled trial intercept.

The computer weighs the relative position, course, speed and altitude of the target against the configuration, remaining fuel, armament and proximity of the interceptor.

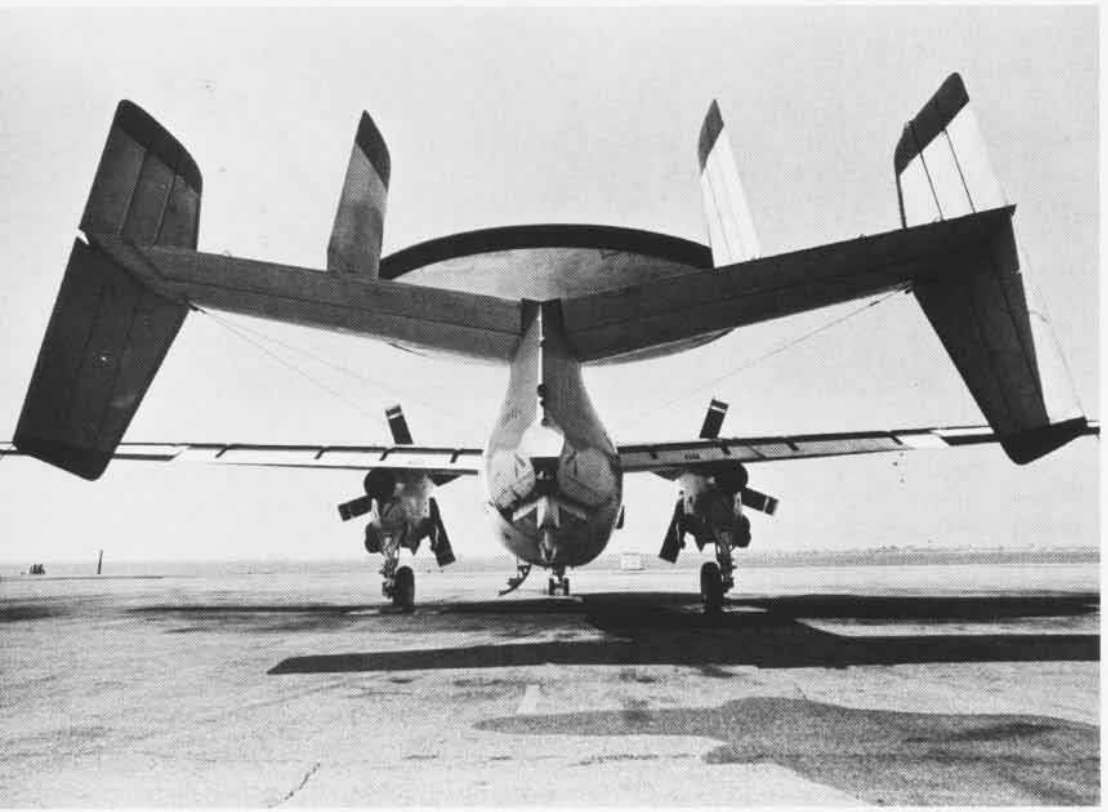
"Pairing lines" show an intercept is possible by projecting the predicted flight path of both aircraft. An interceptor is then vectored by automatic tactical data link into a position where it can investigate the target.

Another track appears. Speed, track and altitude of this latest target agree with the flight plan for a commercial airplane. The operator classifies the target as neutral. When the target enters the "land-clutter" area, the operator expands his scope to 150 miles and enlarges the display.

The F-14 is still on an intercept course with the unknown. In this case, the operator identifies the unknown and orders a rear approach intercept to give the pilot time for visual identification.

Commands are automatically transmitted to the interceptor by data link. The F-14 interceptor identifies a foreign reconnaissance aircraft. The operator now classifies the aircraft as "hostile" and scope symbology is changed accordingly.

The hostile, on sighting the inter-



ceptor, makes a sharp turn and heads away from the defense area. The F-14 escorts the hostile out of the restricted area. One E-2C is capable of controlling many such air-to-air intercepts simultaneously. Multiple tracks can be stored in the computer memory. Any of these tracks can be displayed on any operator console.

Aircraft can be vectored to fixed geographic points, designated as way points, cap stations or strike points.

To ensure a successful strike mission, attack aircraft must be precisely vectored around terrain hazards and defenses to the targets by locating the general area of surface-to-air missile activity.

Using radar return from prominent geographic characteristics, the operator can program a series of way points into the computer to display the best flight path to the target.

The E-2C first vectors newly launched aircraft to a rendezvous point indicated by a scope symbol. The operator then assigns the strike-leader symbol to the nearest way point.

Tactical data link is used to transmit flight profile data from the E-2C to the strike aircraft. Navigational information and turn commands are sent automatically until the mission is complete. Voice communication can also be used in emergencies.

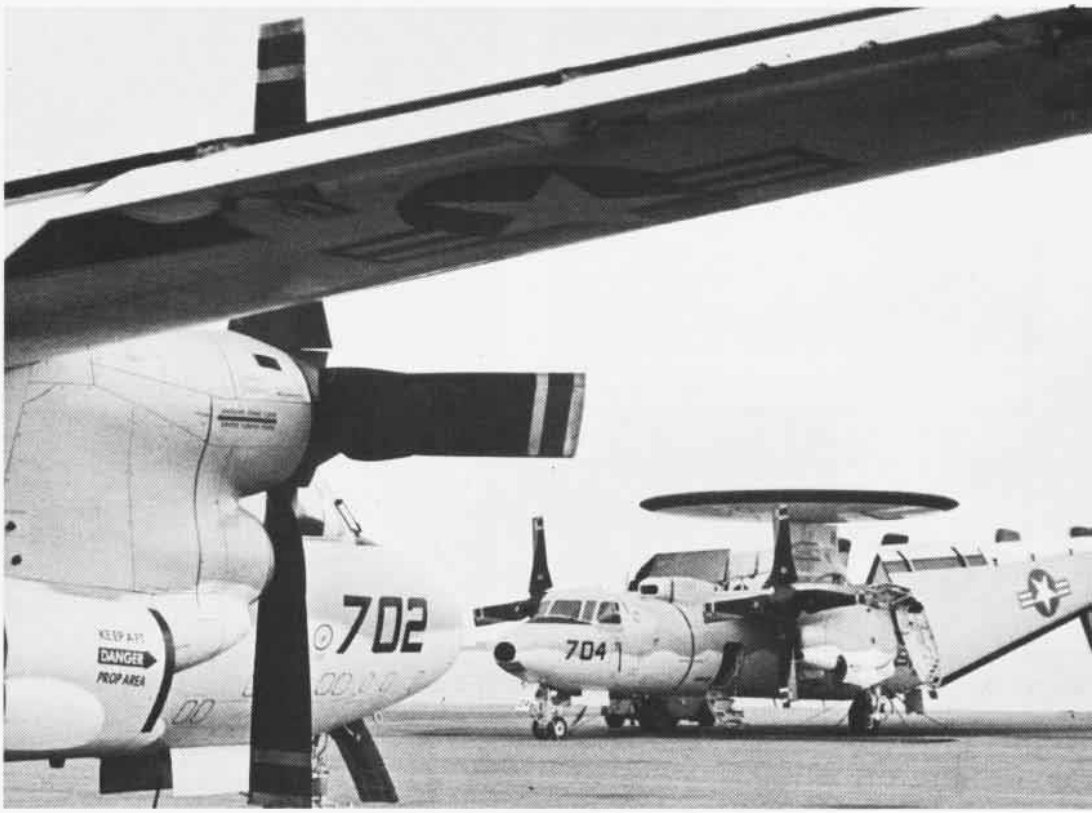
Returning from a mission, strike aircraft are individually identified at a rendezvous point. Then precise navigation information is furnished for return to the carrier or for air refueling or rescue.

Ens. Robert M. Greczek, flying in the flight technician's seat for ACO training at NAS Norfolk with RVAW-120, praises the long-range, high-resolution radar which "makes it possible to run accurate intercepts while getting the big picture back to the carrier."

His pilot, LCdr. James L. Rueff, spent two years at sea with the E-2B and yearns to return to carrier duty with the E-2C. He calls the Charlie "a very large platform."

His copilot, LCdr. William J. Mooberry, calls the E-2C a "tremendous improvement in physical and mental comfort features, safety and engine power." Both pilot and copilot claim the new plane makes their jobs easier. "We've yet to reach the fringes of its potential."

Their CIC officer, exchange pilot Lt. Douglas Miller of the Royal Navy, calls the E-2C avionics system a ". . . masterpiece of engineering. Without doubt the finest AEW system in the world. The concept of maximum data



Parading the ramp at NAS Norfolk, RVAW-120's sassy E-2C shows off its familiar rotodome, new topside airscoop, longer nose — and even sticks out a tongue at the Naval Aviation News' photographer.

handling and automatic function, allied with excellent operator interfacing, is brilliant when you consider the size and weight constraints of the airframe. Most important, the development capability of the system ensures meeting future demands beyond this decade."

Lt. Michael G. Murray describes the E-2C as "the most sophisticated airborne control platform available today. Completely computerized and automated, the system allows the air control officer to automatically control six intercepts simultaneously – in addition to running a manual mode. Tracking, identification and control of aircraft are quantum improvements over anything else."

Just last September, Navy tradevmen at the Fleet Specialized Operational Training Group, Atlantic Fleet, Norfolk, Va., connected an array of computers, radar displays and related electronic gear in a new E-2C tactics trainer. The Navy commissioned its first digital computerized cockpit trainer eight months earlier. An operational trainer is now in the planning stage.

The combat information center in the tactics trainer has an actual radar set, interrogator, IFF and radar detection processors; countermeasures, passive detection and navigation equipment; and inflight performance monitoring and communication systems.

RVAW-120, which supplies replacement pilots, naval flight officers and enlisted flight technicians to all East Coast VAW squadrons, also provides the E-2C trainer instructors.

These instructors monitor the tactics training with a problem-control complex of eight interactive cathode ray tube displays to call up 44 different "data pages" with the help of light pens and keyboards.

Over in the cockpit trainer, a replacement pilot takes four periods to learn proper switch positions, instrument indications and normal operating procedures. This is followed by six more sessions of the syllabus.

The instructor enters hydraulic, electronic or engine malfunctions into the digital computer so they will show up during the simulated flight. Each student's procedure sequences are displayed on a cathode ray tube. Thus, students can familiarize themselves with system operation and emergencies in this trainer before their first actual flight in the Navy's newest sentry in the sky, the E-2C *Hawkeye*.

The E-2C project began officially with a development concept paper (DCP) distributed in May 1968. Of course, a DCP is only a series of thoughts and designs. It is the job of the project office to translate these thoughts and designs into an airplane which works reliably in the fleet.

With a system like the E-2C – with such a big job to do – we've really had a challenge.

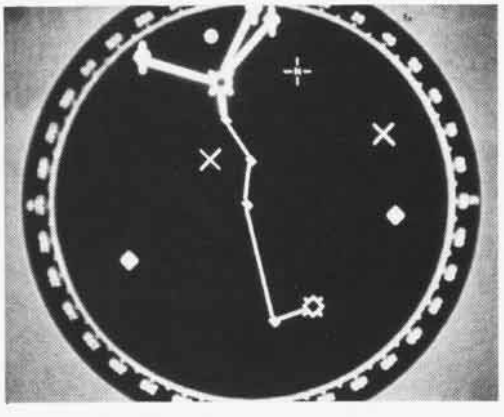
There are many dedicated, professional people involved. People in the Navy, in civil service, and at contractors' plants all over the country. Budgeting, publications, spares, support equipment – the list of tasks is long, and so are the hours and the professional competence of the many people who support us.

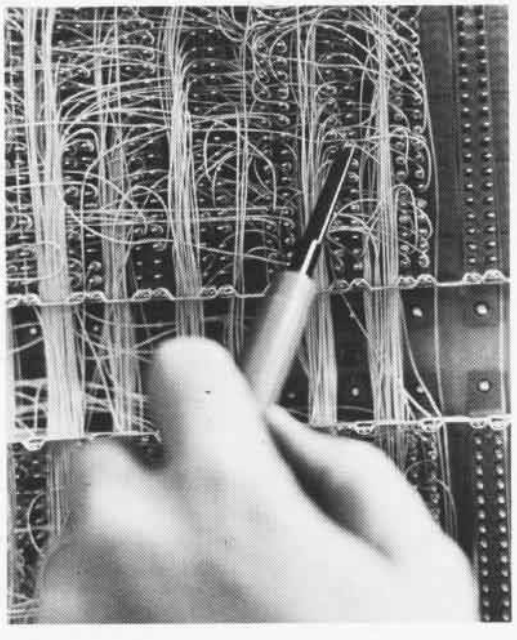
We think we've done a good job. We've been through the gauntlet of Navy preliminary evaluations and board of inspection and survey trials with words of praise: "The E-2C aircraft represents an order of magnitude improvement . . . ."

We are on schedule and within two percent of 1970 cost projections. But now our hearts and minds are with the USS *Saratoga* deployment. She left on September 27 with the first squadron of E-2Cs. We will soon learn how well we have really done.

Captain Frank H. Roth
E-2 Project Manager

Left, TD2 Rodney Rockefeller, FASOTraGruLant, removes a defective gauge from the E-2C cockpit trainer. Below, VAW-124's Ensigns Jim Blake and Paul Skurski and AT2 Bill Orth monitor a strike mission on the 15-F8 tactics training console. Bottom, TD1 Bill Wilburn checks a circuit on the instructor console, while the steady hand of TD1 Charles Wooters, FASOTraGrulant, tests computer circuitry.






What about the infantry??
GIVE THE MARINES MORE SPACE!
Get back to real aviation; drop the VS/VR/VP stuff!
&@#*!&%@?
OK GUYS— ABOUT THAT SURVEY!
DON'T MESS WITH IT!!
How about a centerfold with girls?
I yearn for the NAV AIR NEWS of the 50's —— It was more newsy.
YOUR MOD FORMAT TURNS ME OFF
I write you to reduce our subscription to 20 but nobody pays attention!

The returns from *Naval Aviation News'* biennial reader survey are in. The survey appeared in the May 1974 issue and was designed to help the staff record reader trends and, ultimately, to assist us in improving the monthly product.

We're grateful to the hundreds of you who completed and sent in the form. We'll aspire to use the information in a positive way.

The majority of readers endorsed *NANews* – its content, format and overall informative and educational value to the aviation community. Of course we are not without critics and that, most assuredly, is a healthy fact.

Despite rare protestations to the contrary, "Grampaw Pettibone," as might be expected, repeated as the most popular feature. The Sage of the Airways is sort of like our life's blood around here and we need all the nourishment we can get. An HM2 SAR crewman called it "Pettibone Power." Gramps has consistently been rated tops since he first thundered forth during World War II.

Many of you asked for color pictures. Color costs. However, we're endeavoring to feature bold bright hues when we can in future issues. *NANews*, by the way, was the first naval publication to feature color photographs back in 1968.

One gentleman yearned for a centerfold, replete with shapely lady. For shame. Notwithstanding a disinclination to broach a chauvinistic subject, this proposal has been rejected. We'll stick with the sort of curves you see on wing-mounted fuel tanks, the *Hawkeye* rotodome or the F-14 canopy bubble.

From the shores of Tripoli came the cry: "We want more on the Marines." So do we. We want to oblige but must solicit flying Leatherneck PAOs to increase the amount of material they are presently sending. We have belabored the point in the past but, generally speaking, we're only as good as our sources.

Our sometimes sensitive hides were scratched a bit by a few who panned *NANews'* format. A civilian reader claimed we were excessively mod. A reserve lieutenant proclaimed we weren't mod enough. He added that we would be well advised to emulate *New York* or *Ms.* magazines. Perhaps.

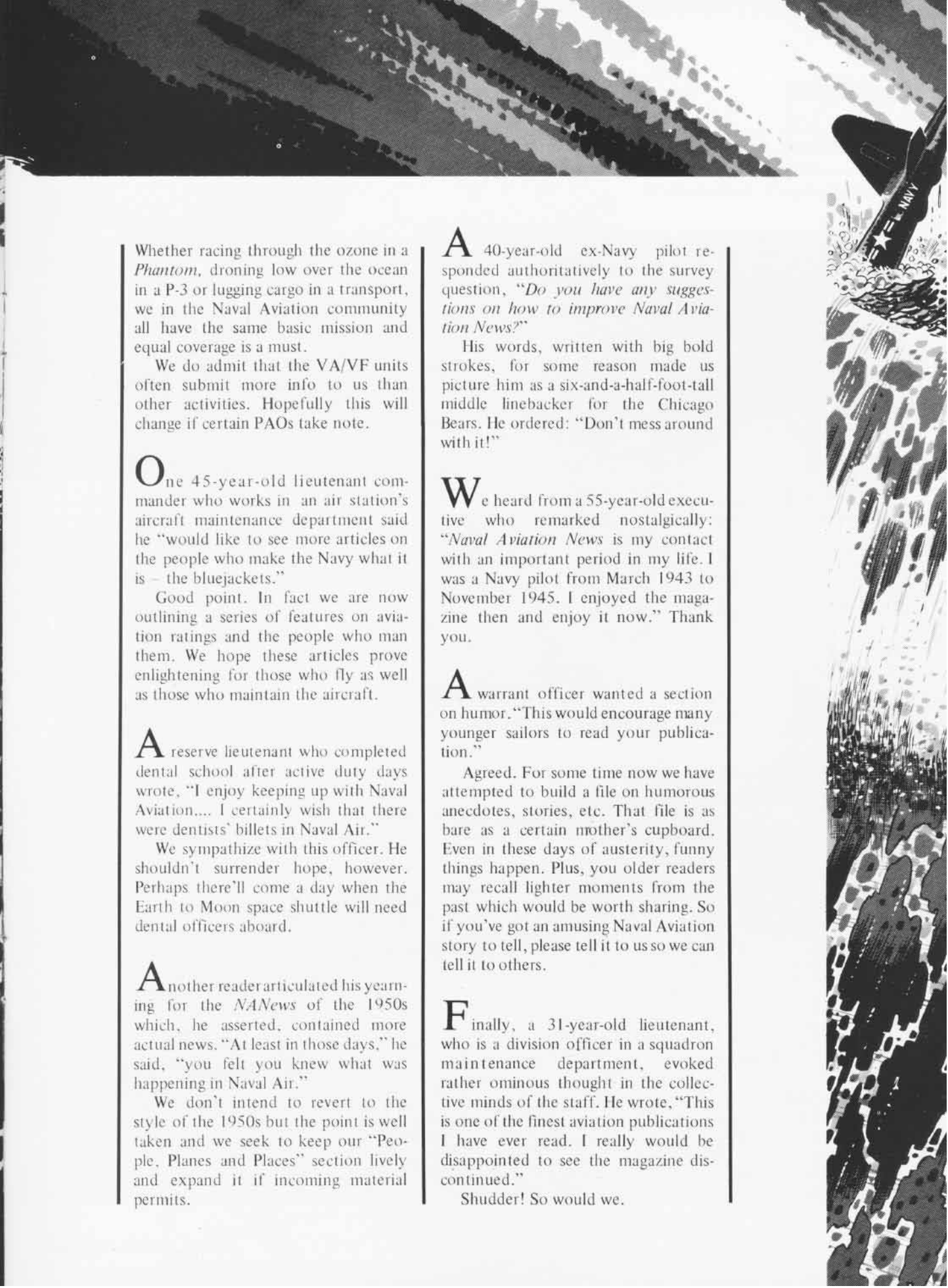
We are open to new ideas and are quite proud of our art director who has come up with many. However, he is a rather rabid football fan and, until the season is over, a large portion of his creative talents is being sapped by a local Pop Warner league team which needs all the new play designs it can get. It may be after the Super Bowl before recognizable format changes will appear.

Complaints about subscription service were not uncommon. Cited were delays in receiving issues, incorrect addresses and nonavailability of the magazine in spaces other than the ready room. Along with the Government Printing Office and various other agencies up the line responsible for publishing and distributing *NANews*, we're striving for improvement in this area. Unfortunately, improvements are slow in coming. But we're working on them.

When the troops down below don't see *NANews*, the fault lies somewhere else. We would appreciate it if those of you who handle correspondence routing would try to make copies available throughout your unit. If you require subscription increases, let us know and we'll see to it.

A gentleman who identified himself as a senior officer demanded that we "cut out the VP and VS stuff and get back to real aviation!" With all due respect – a whammy on this writer.


NEWS
Somewhere off the Atlantic coast NaNews staff makes unanimous decision: OK, THAT SETTLES IT! NEXT MONTH WE DROP 'ON PATROL'.



Whether racing through the ozone in a *Phantom*, droning low over the ocean in a P-3 or lugging cargo in a transport, we in the Naval Aviation community all have the same basic mission and equal coverage is a must.

We do admit that the VA/VF units often submit more info to us than other activities. Hopefully this will change if certain PAOs take note.

One 45-year-old lieutenant commander who works in an air station's aircraft maintenance department said he "would like to see more articles on the people who make the Navy what it is – the bluejackets."

Good point. In fact we are now outlining a series of features on aviation ratings and the people who man them. We hope these articles prove enlightening for those who fly as well as those who maintain the aircraft.

A reserve lieutenant who completed dental school after active duty days wrote, "I enjoy keeping up with Naval Aviation.... I certainly wish that there were dentists' billets in Naval Air."

We sympathize with this officer. He shouldn't surrender hope, however. Perhaps there'll come a day when the Earth to Moon space shuttle will need dental officers aboard.

Another reader articulated his yearning for the *NANews* of the 1950s which, he asserted, contained more actual news. "At least in those days," he said, "you felt you knew what was happening in Naval Air."

We don't intend to revert to the style of the 1950s but the point is well taken and we seek to keep our "People, Planes and Places" section lively and expand it if incoming material permits.

A 40-year-old ex-Navy pilot responded authoritatively to the survey question, "*Do you have any suggestions on how to improve Naval Aviation News?*"

His words, written with big bold strokes, for some reason made us picture him as a six-and-a-half-foot-tall middle linebacker for the Chicago Bears. He ordered: "Don't mess around with it!"

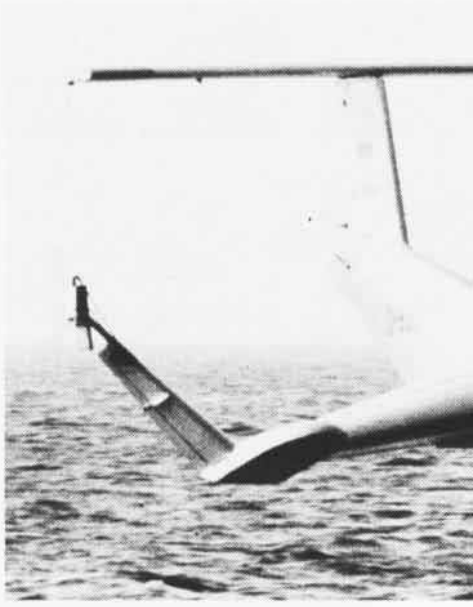
We heard from a 55-year-old executive who remarked nostalgically: "*Naval Aviation News* is my contact with an important period in my life. I was a Navy pilot from March 1943 to November 1945. I enjoyed the magazine then and enjoy it now." Thank you.

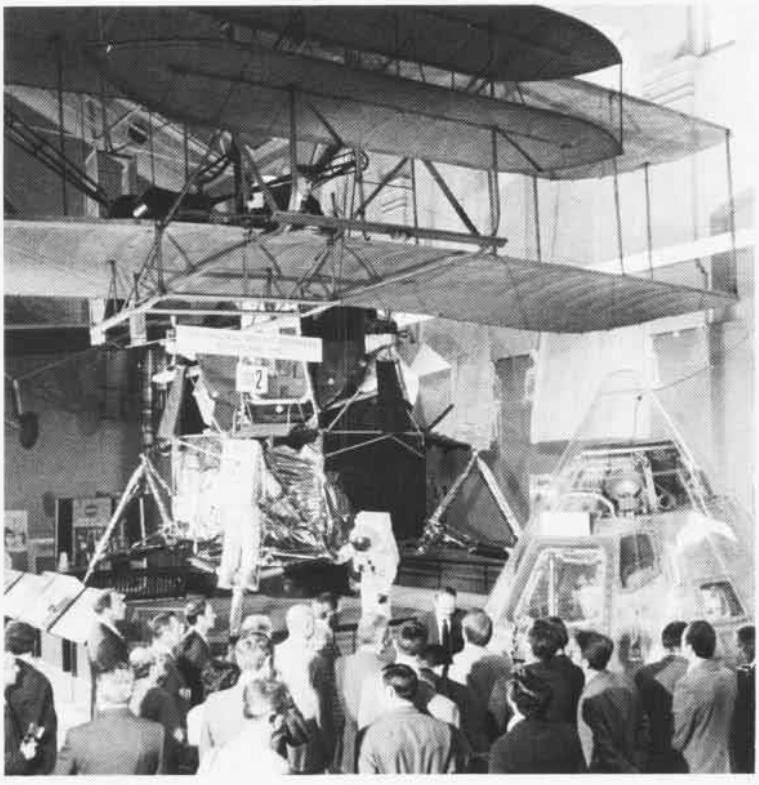
A warrant officer wanted a section on humor. "This would encourage many younger sailors to read your publication."

Agreed. For some time now we have attempted to build a file on humorous anecdotes, stories, etc. That file is as bare as a certain mother's cupboard. Even in these days of austerity, funny things happen. Plus, you older readers may recall lighter moments from the past which would be worth sharing. So if you've got an amusing Naval Aviation story to tell, please tell it to us so we can tell it to others.

Finally, a 31-year-old lieutenant, who is a division officer in a squadron maintenance department, evoked rather ominous thought in the collective minds of the staff. He wrote, "This is one of the finest aviation publications I have ever read. I really would be disappointed to see the magazine discontinued."

Shudder! So would we.





In the Beginning . . .

There were the Wright Brothers. Long after came the astronauts. Michael Collins of Apollo II, now Director of Smithsonian's Air and Space Museum, briefs Soviet Apollo-Soyuz crew during Russians' fall visit.

Togetherness?

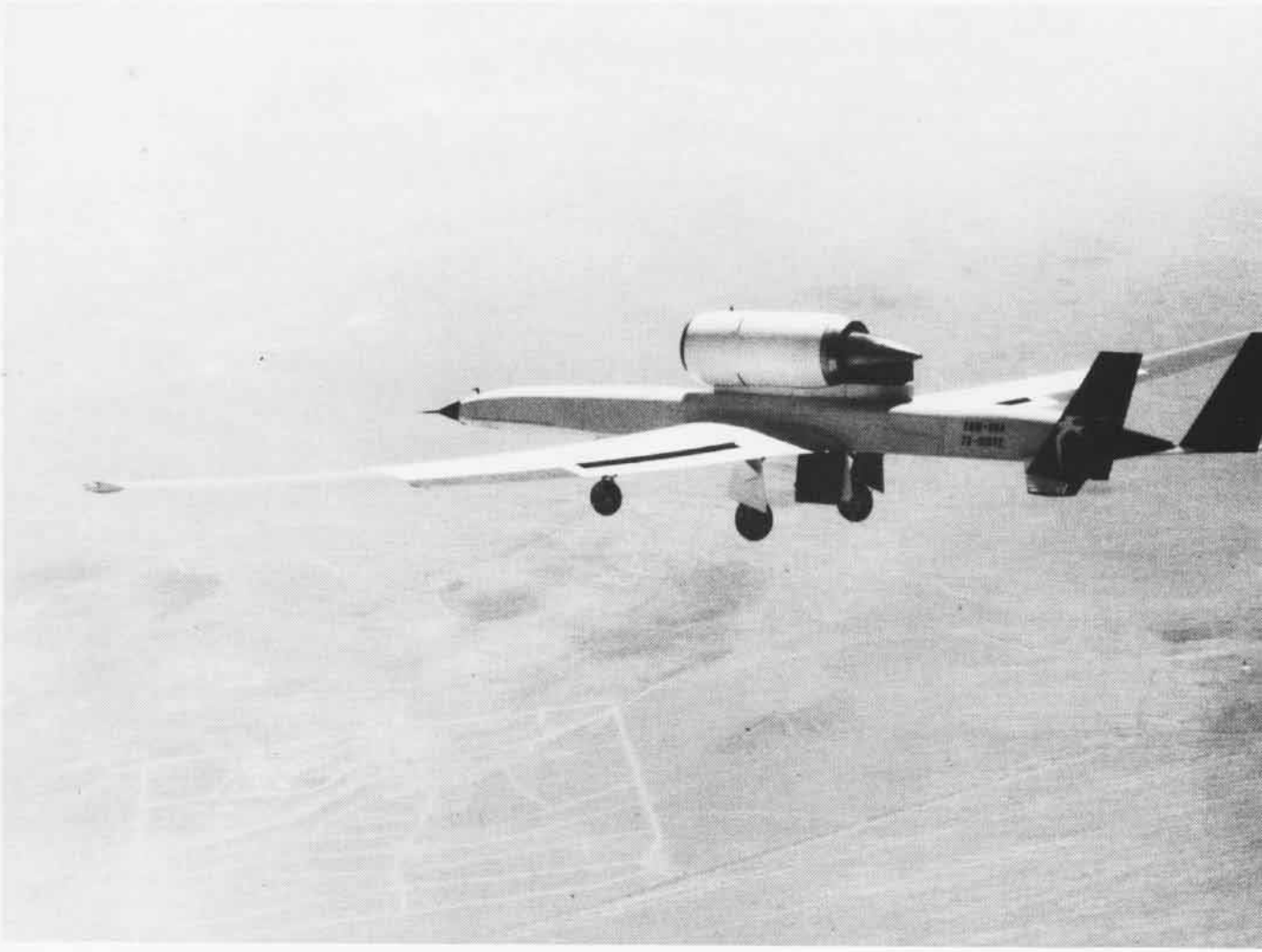
In this unusual photograph a pair of unlikely helicopters seem to fly in formation. On the left is an SH-3A Sea King from HS-11. The other helicopter is a Soviet Hormone type.

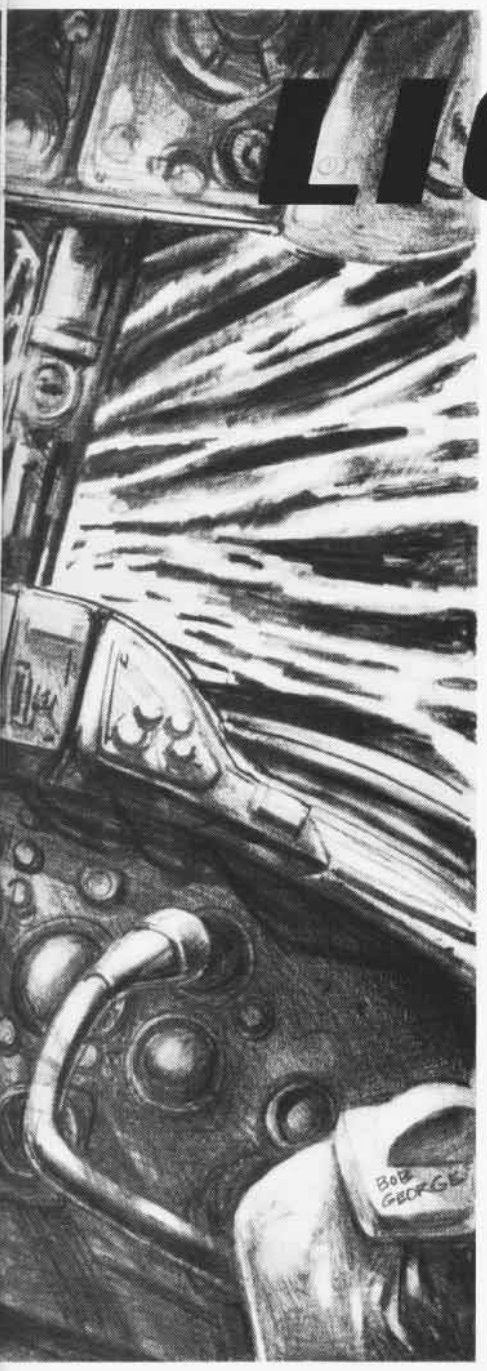
Airfoil

This VFW-Fokker X-113AM airfoil has a glide ratio of 1 to 30. A test vehicle, it is providing data for development of larger airfoils.

Where's the Cockpit?

None is needed with this remotely piloted vehicle called Compass Cope R built by Teledyne Ryan for the USAF. Craft made its first flight last August.





LIGHTNING

By Commander Neil F. O'Connor

Today's aircraft are often favorite targets of lightning. The sensor-type equipment aboard planes is especially affected by this powerful force of nature when it threatens airspace and those caught in it. Radomes, antennas and related items are part of sensor systems which are vital to the effective and safe operation of sophisticated flying machines of the Seventies. The various electronic instruments located at aircrew stations normally receive their signals through the units on the aircraft's external surface. When those units are struck and damaged by lightning, data is often lost until repairs are made.

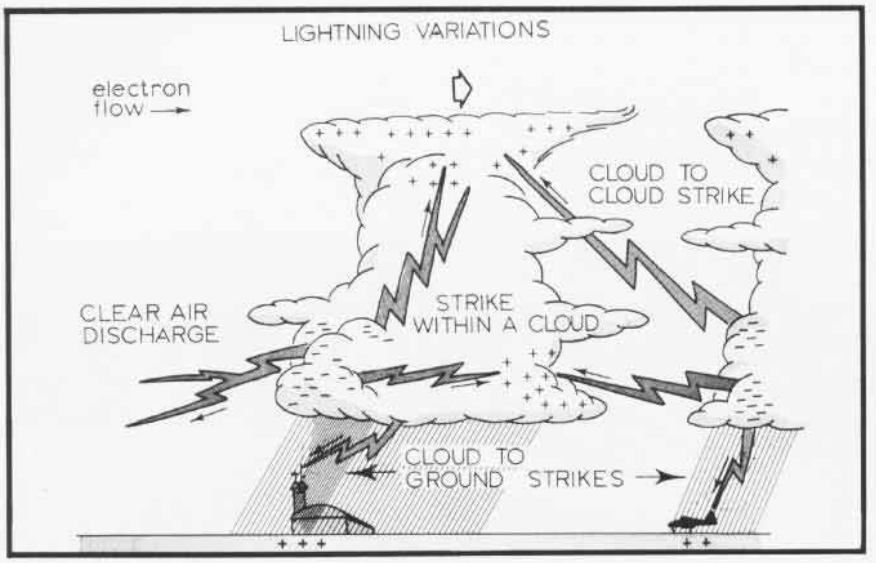
Aircraft and component manufacturers have always been wary of lightning hazards. Aerodynamic engineers and other experts, through the years, have made noteworthy changes to fight these hazards. Efforts were significantly accelerated, however, after the 1963 crash, in bad weather, of a four-engine jet in which 81 persons died.

Investigation of the crash indicated that a fuel-venting tank on the port wing was blown off by lightning. Consequently, alterations in fuel tank bonding were made. Additionally, modifications of static discharge and more stringent flight control procedures were initiated.

Since the disaster, the lightning hazard to the aircraft has been significantly diminished. In a letter dated April 18, 1974, Martin V. Clarke, Bureau of Aviation Safety, National Transportation Safety Board, wrote, "A recent review of our data shows that from 1964 to 1972 lightning appears in the causal area of air carrier accidents only two times out of a total of nearly 400 accidents, and also appears only two times from 1964 to 1972, out of a total of more than 45,000 general aviation accidents."

Similarly, the Navy has been relatively free of major accidents as a result of lightning. Yet, during the 43-month period, August 1970 to February 1974, 83 reports of lightning strikes on naval aircraft were filed at the Naval Safety Center, Norfolk, Va. While there were no major personnel injuries, there were a significant number of incidents where sensor equipment was damaged and had to be replaced.

Although many lightning strikes are reported, it is suspected that not all are. In an article on lightning in the June 1971 issue of *Naval Aviation News*, Dr. George Freier wrote that commercial jets experience a damaging lightning strike once in every 2,500 hours of flight. Dr. Freier also indicated that commercial operators maintain more detailed records of such incidents.



The phenomenon of lightning requires a swelling cumulus or cumulonimbus cloud. The formation of thunderstorms with attendant lightning is caused by four types of lifting action: frontal, orographic, convective and convergence. The latter three can be found within a relatively uniform air mass and may be isolated or appear in large clusters covering extensive geographic areas. Thunderstorms associated with fronts tend to be more numerous and are organized into definite and more readily identifiable lines. Regardless of the type of lifting action that initiates them, they are all similar in makeup.

Before considering the impact of lightning on aircraft and their sensors, let's consider this hazard from the vantage point of the observer on the ground – where lightning is most lethal. Approximately 150 people are killed each year in the U.S. by lightning. With the exception of the disastrous tornadoes in April of this year, more people are usually killed by lightning than by tornadoes and hurricanes combined.

In order to learn more about the phenomenon, the forces of lightning are routinely measured by several scientific institutions. For example, near Lugano, Switzerland, two instrumented towers, on prominent peaks which are struck approximately 100 times a year, have recorded currents in excess of 200,000 amperes and temperatures five times hotter than the sun.

The manner in which an electrical charge reaches the earth's surface is similar to that of lightning traveling within a cloud, or to a nearby cloud or into adjoining clear airspace. In a swelling cumulus or cumulonimbus cloud, there are sectors of positive and negative charges. In general, greatly simplifying a complex mechanism, the larger water droplets possess a negative charge while the smaller droplets are positively charged. Basically, the top of the cloud, filled with the lighter particles, is positively charged, while the lower portion, with the heavier raindrops, is negatively charged.

As the negative charge on the bottom of the cloud increases, a positive field on the ground gradually builds up and travels, shadow-like, beneath the cloud. As the winds aloft carry the cloud with the prevailing flow, the positive shadow follows, climbing any prominence it encounters – hangars, control towers or even the vertical stabilizers of aircraft parked on the ramp – in order to get closer to the negatively charged cloud base. When the attraction between the two different electrical fields can no longer be constrained, the process of the flash takes place. The initial phase of the flash is the appearance of the "stepped leader" which is an electrical channel between the base of the cloud and the earth's surface. It is essentially the path of least resistance. When photographed by high speed cameras, the stepped leader appears only as a very faint line as it works its way earthward in a series of 40 to 50 steps, in a trip that takes less than one-thousandth of a second. It is estimated that this conduit between cloud and ground is probably not much more than one or two inches wide.

Once in the vicinity of the earth's positive charge, the stepped leader induces the return stroke. It is the ground-based return stroke that determines the point at which lightning actually strikes. When the initial return stroke has been completed, a negative downward flow follows. Called a "dart leader," this earthbound stroke induces up to five subsequent return strokes. The entire evolution is completed in less than one-tenth of a second and frequently appears as a single flash.

While cloud-to-ground lightning is more often observed by the ground observer, lightning flashes are more frequent within the clouds and from cloud to cloud than from cloud to ground. Flashing within a single thunderstorm cell starts at a rate of one to two per minute, then rises abruptly to an average peak of five flashes per minute. If the thunderstorm is especially intense, this average can be greatly exceeded.

Timewise, the greatest lightning activity occurs when the cloud reaches its maximum vertical growth. The most intense horizontal flashes occur between the freezing level and minus ten degrees centigrade in the mature stage of the cloud's development. While the life cycle of a thunderstorm varies from 20 minutes to one-and-a-half hours in duration, it can usually be expected that thunderstorms will develop in clusters covering areas in excess of 100 miles, lasting for six hours or more.

It has been estimated that there are at least 1,800 active thunderstorms at any one given time throughout the world. Given a flashing rate of five strikes per minute leads to a

global estimate of 150 discharges every second.

Considering the worldwide operation of deployed Navy aircraft, it is remarkable that only 15 incidents of lightning strikes were reported to the Naval Safety Center in 1972. Perhaps the use of an IBM-type card report, requiring minimal effort to complete, would yield a more accurate picture of lightning incidents. However, those aircraft that sustained lightning strikes which were reported have provided an excellent reference source on the damage that is being sustained by sensor equipment.

On occasion, the tremendous energy involved in lightning strikes has resulted in shattered radomes. While incidents of this magnitude are not common, the following narrative of a strike on an EA-6A illustrates what damage can occur.

"Lightning strike on hi/lo mission passing through stratified layer at 14,000 feet for 15,000 feet assigned; pilot slammed violently back against seat. Aircraft remained under control with engine instruments normal. Tacan, radar failed. ARC-51 operable but loud background noise. Entire armament and weapons release panels illuminated with both green and yellow light logic. Normal landing made. Post-flight inspection revealed ALR 45 tail antennas, coax line, pre-amp plugs burned. One-half-inch hole burned in tail cap. Various elements of radar, pitch trim, amplifier, IMS, ASCU, ARC-51 and Tacan damaged."

Another narrative of an incident in March 1972 involving an SP-2H confirms that lightning may well strike an aircraft in flight more than once. "While IFR 170 knots at 8,000 feet, aircraft struck by lightning. First strike resulted in smoke in after station from burning wires to tail navigation lights and cracked MAD cover. Second strike five minutes later resulted in starboard tip tank disintegration. Tip tank remains not jettisoned due to possible impact with empennage. After initial swerve, aircraft control was normal. Routine landing followed."

A report of a night lightning strike on a deployed P-3B provides an excellent summary of not only the lightning damage, but also of the meteorological conditions which existed at the time of the incident.

"While on station below an overcast embedded with thunderstorm cells, aircraft was struck by lightning. Indicated altitude was 2,000 feet and outside air temperature was seven degrees centigrade. A buildup of St. Elmo's fire was noted on the center windshield for approximately two to three seconds, accompanied by a brilliant flash and loud bang. A portion of the lightning arrestor strip could be seen blowing in the airstream and both the pilot's and copilot's marker beacon lights came on. Mission was aborted. Maintenance investigation revealed cracked forward radome and blackened

radar dish. Additional damage was confined to shattered aft radome, melted MAD gear cannon plugs and blackened MAD head. Probable cause of extensive damage attributed to inability of lightning strips to withstand a potential force of this magnitude."

Of the 83 lightning strikes reported to the Safety Center and studied by the author, 68 included the flight altitude at which the strike took place. It quickly became obvious that no sector of the sky is "lightning proof." A P-3 was struck at 1,200 feet, while an F-4 was hit at 39,000. But most lightning strikes were found to have occurred below 12,000 feet. A total of 41 strikes (63 percent) were in this layer. This compares almost identically with the statistics of damaging strikes on commercial aircraft.

Included in 28 of those particular 68 strikes was the speed of the aircraft. It is known that aircraft can provoke lightning strikes by distorting electrical fields and that aircraft develop a self-charge by colliding with precipitation elements. While not conclusive, the evidence suggests that the speed range, 200 to 249 knots, might be critical for inducing lightning, particularly if the aircraft is flying below 12,000 feet.

Of the same 83 strike reports recorded at the Safety Center, approximately 63 percent (53 cases) indicated that the first lightning strike hit an element of a sensor system on the plane's external surface. The remaining strikes hit various portions of the aircraft.

Unfortunately, there was insufficient information in the incident reports to establish whether or not lightning strikes were made primarily on aircraft flying in IFR conditions. However, there were several reports which lead to the conclusion that circumnavigation of thunderstorms should be accomplished at ranges no less than four to five miles.

It was interesting to note that 43 (of the same 83 reports) involved P-3s. As a major platform in ASW work, the P-3 is heavily reliant upon sensors for target search and prosecution. While the P-3 is fitted with many of the sensors found in most other aircraft, the newer models, such as the P-3C, have onboard data processing systems which allow display of target data derived from ASW sensors.

In studying the lightning strikes on sensor systems of the P-3, it was found that in 17 of the 43 cases (39 percent) lightning first struck the forward radome. The radome was split open three times, holed six times and charred eight times. The MAD gear was the second favorite target of lightning, receiving eight (18 percent) of the strikes. Damage to the MAD ranged from split heads and booms to charring and holing. The ECM of the P-3 was hit three times, charred twice

and split once. Antennas were struck six times. The remainder of the strikes were either on the props or non-sensor portions of the aircraft.

Of the 43 reports on P-3s, 31 included the altitude of the incident allowing a compilation of lightning strikes in the P-3 operational flight envelope.

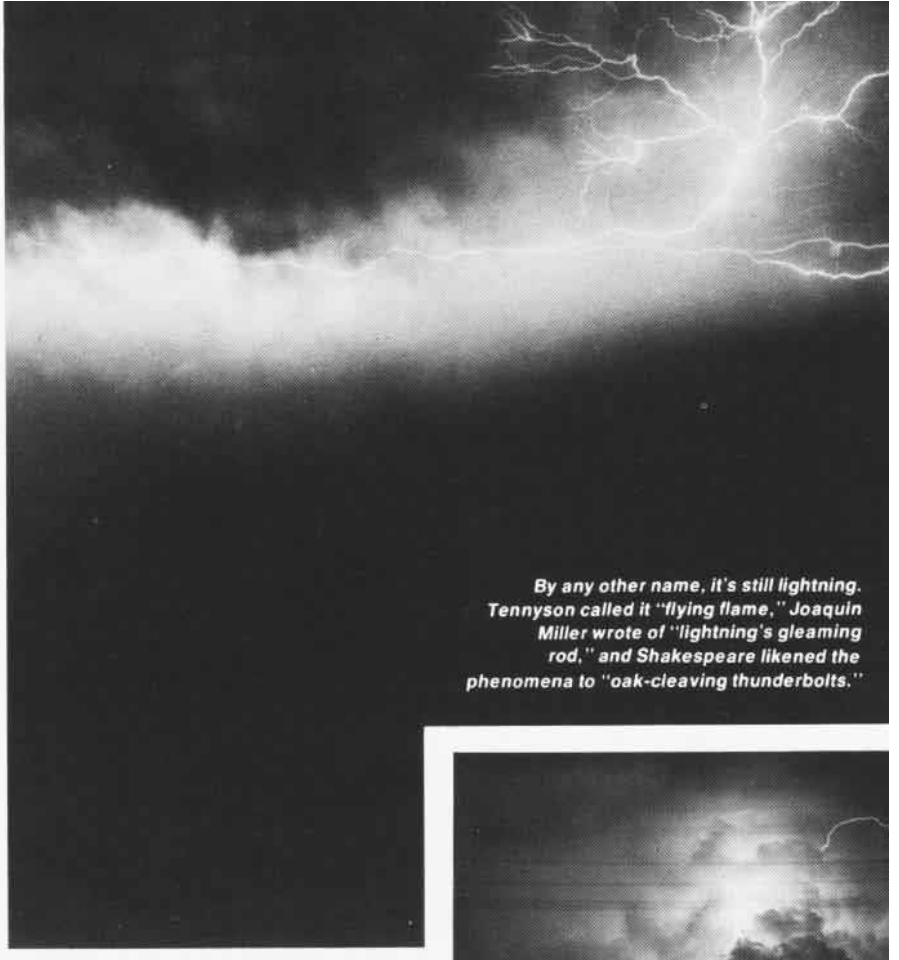
These figures confirmed that all aircraft in this study were more vulnerable to lightning strikes below 12,000 feet. Because of the P-3's mission-altitude profile, it is apparent that sensors aboard ASW aircraft are more likely to incur lightning damage than any other operational platform.

While the P-3 sustains 39 percent of all lightning strikes on the forward radome, this value is not far removed from the 30 percent rate that the F-4 experiences on the radar/nose area.

Of the 83 reports, 43 strikes occurred in airspace over the United States and in every month except April. The remaining 40 strikes, while not over the U.S., were in the Northern Hemisphere where the seasonal regime is similar to that of the U.S. Of the strikes that took place outside the continental limits, 11 occurred in February, not a month noted for high thunderstorm activity, with a similar number observed in September. With respect to the incidents that took place in U.S. skies, March, May and July were months with a similar number of strikes – six incidents reported.

The greatest number of thunderstorms over the U.S. take place on the East Coast in July, while in the Midwest, June appears to be the month of greatest activity. On the West Coast there is a comparatively small number of thunderstorms observed in a year.

Those months when they are the least expected proved to be the time when lightning strikes on aircraft occurred more frequently. These are also months when thunderstorms are less likely to be forecast by meteorologists. When such activity does occur, it is not usually well defined but is masked by multi-layered cloud decks or otherwise embedded in the cloud structure. Unless associated with a strong or severe frontal system, thunderstorm development may not be readily detected.



By any other name, it's still lightning. Tennyson called it "flying flame," Joaquin Miller wrote of "lightning's gleaming rod," and Shakespeare likened the phenomena to "oak-cleaving thunderbolts."

While sensor-type equipment has been a primary target of lightning, there are indications that plastic coverings on external sensor gear may be adding to the damage they sustain. In an unclassified study for the Office of Naval Research, Dr. E. T. Pierce, Stanford Research Institute, reaffirmed that "The behavior of both plastics and composites when subjected to lightning currents is much less satisfactory than that of conventional metals, with the chance of material damage being much greater. There are also some subtle features.

"For example, as metals are replaced by less electrically conductive materials, the inherent safety of shielding by 'Farraday-cage' effects is reduced. Furthermore, in electrically inhomogeneous systems the currents are channeled preferentially into the better conducting media; therefore, current densities and induced fields are increased and deleterious effects are consequently enhanced."

The increasing use of plastics in aviation electronics and the trend toward higher performance aircraft such as the F-14 have led to increased vulnerability to lightning strikes.

It is conceivable that we have reached, if not already passed, the threshold of that trend. By comparing the strikes of 1973 with those of 1971 and 1972 it becomes evident that there has been a significant increase in the total number of lightning strike reports submitted on Navy aircraft. The comparison of the total number of lightning strikes reported in 1972 (15) in contrast to 1973 (32) indicates either an increased emphasis on the actual reporting of the incidents or

that Navy aircraft are in reality sustaining a higher number of strikes.

Thunderstorm activity, which generates lightning, can generally be forecast with a reasonable degree of accuracy with respect to time and area. Thus a task force commander may, if the tactical situation allows, have an option to select specific windows of time to conduct operational missions. By considering the diurnal variation which is normal in thunderstorm activity, the task force commander has available a time frame in which the probability of lightning will be near zero.

For example, maximum air-mass type thunderstorm activity can be expected in the late afternoon or early evening. If the mission is highly sensor-reliant, this period would be the least desirable. An early morning launch would most likely achieve the desired results of protecting the sensor equipment.

In the situation where thunderstorms are associated with frontal activity, a task force commander might opt to launch the mission after the passage of the frontal system.

There are other considerations which can minimize the lightning threat. Where there are not overriding considerations involving tactics, these considerations may be applied to advantage. For example, it has been shown that lightning strikes are more probable at altitudes below 12,000 feet. This suggests that prolonged operations below 12,000 feet, whether loitering or in a holding pattern, should be held to a minimum in thunderstorm areas.

Another aspect is in the selection of airspeeds. It appears that aircraft operating in and about thunderstorm activity while on a mission should avoid the speed range between 200 and 249 knots (thus minimizing the probability of a lightning strike). A reduction of airspeed appears to be the best recommendation, not only to reduce the lightning hazard but also to minimize the possibility of structural damage to the aircraft by turbulence.

Another option open to a task force commander is the utilization of a tactical aircraft for weather reconnaissance during those periods when thunderstorms are forecast along the route or in the target area. This aircraft, if radar-equipped for weather search, could provide valuable meteorological information which could be used by subsequent flights to avoid hazardous areas. Under EMCon, visual observations would necessarily replace the radar scan, but would still provide a useful on-scene estimate of the situation.

The task force commander may also use lightning in his behalf. A lightning barrier, for example, could provide a temporary shield in the movement of surface forces. During periods when it is desirable to avoid or minimize ocean surveillance, an excellent, albeit time-limited, cover may be provided by lightning and the associated thunderstorms. Gusty surface winds normally associated with thunderstorms increase the sea state which in turn aggravates the radar ground clutter problem.

Ultimately, the aircraft operator is responsible for protecting his platform of sensors. The pilot must be alert to the sensitivity of his electronic cargo. Carrying the sensors safely through a lightning-filled environment may very well be just as important to mission effectiveness as reaching the target with the weapons load.

The Reserve ASW Tactical School at NAS Willow Grove has added a Sensor Station Three Position Trainer to its curriculum, which is a **mock-up** of the P-3 *Orion* non-acoustic station. The trainer simulates all inputs that a non-acoustic operator would receive, providing realistic ground training to ASW students.

The trainer, first of four, was built by AD1 Dave Wallace and AW1 Dave Burman of the training devices division. They used surplus or recycled parts when possible.

For the **fifth time** in their Navy careers, Commanders Ron Boyle and Ted Bronson are serving in the same squadron at the same time. The pair grew up only 30 miles apart and attended the same college. They served together in VAs 15, 44, 45, again in VA-44, and currently in VA-46, at NAS Cecil Field. Cdr. Boyle is C.O. and Cdr. Bronson X.O. of the *Clansmen*, flying A-7s aboard *Kennedy*.

To ensure that fully qualified maintenance crews are available to support squadrons and shore stations, HSL-31's fleet readiness aviation maintenance personnel, **(FRAMP)**, department trains replacement helo maintenance crews in the LAMPS detachment concept.

Each student receives four to 16 weeks of individualized instruction. All aviation ratings are trained in their particular rating to fully qualify them in the maintenance program, which is also tailored to meet the students' previous experience and qualifications, and the requirements of the duty station. They receive six to nine weeks of formal schooling at NAMTraDet 1071, NAS Imperial Beach. The rest of the time is given to practical job training in aircraft and ordnance areas.

NARU Alameda, home of the only two A-3 reserve squadrons, VAQs 208 and 308, now has an **A-3** training department headed by Commander Dave Clem under the command of Captain Thomas A. Kamm, NARU Alameda's C.O. The department already has the first two of three A-3s and will train flight officers for the fleet as well as air crews and maintenance personnel.

Ens. Jane Skiles is the first woman to graduate from the Joint Services C-130 school at Little Rock AFB in Jacksonville, Ark. She is also the **first Navy woman to qualify as a C-130 pilot,** completing her C-130 check ride on August 6.

During Operation *Unitas XV,* VP-26 delivered to Roosevelt Roads, P.R., a special shipment of **Handclasp material** collected from the NAS Brunswick, Maine area – nearly 3,000 pounds of clothing, canned food, toys, powdered milk and flour. Added to donations from other generous people, these supplies were given to churches, schools and orphanages in the South American countries. During last year's cruise, U.S. Navy men distributed over 20 tons – *Unitas XV* hopes to exceed that.

Each year for the last 15 years, the U.S. Navy has trained with South America's maritime nations. This operation provides the training necessary to defend, in the event of war, the sea lanes which are of vital importance to all the Americas.

The unique takeoff and landing features of the AV-8 are being fully utilized this fall with the **Harrier's deployment aboard LPHs.** This is the first time *Harriers* and helos are working together on a landing platform for an extended period of time.

HMM-263, according to its commanding officer, Lieutenant Colonel Carroll A. Palmore, flies AV-8As, UH-1Ns, CH-53s and CH-46s. Its mission is to support the battalion landing team and be ready for any contingencies.

The operational concept of the AV-8A calls for it to be based aboard ships of the amphibious task force while en route to the objective. The concept is called sea basing. *Harriers,* operating from sea-base ships, give highly responsive air support to the landing force operating close to the beachhead.

A distress call from the Los Angeles Control Center was answered by LCdr. John M. Lusignan, an instructor pilot attached to VS-41, NAS North Island, Calif., while on a routine training flight. A Boeing 720 en route to Hawaii was in trouble. Western

Airlines Flight 567 leaving Los Angeles International Airport had a suspected blown tire which could cause damage to the landing gear. The captain needed verification from any aircraft in the vicinity since the trouble area could not be seen from observation windows.

The Navy plane, an S-3A *Viking,* rendezvoused with the Boeing 720 at 15,000 over Catalina Island. LCdr. Lusignan verified that the jetliner did indeed have a blown tire in the forward section of the right inside landing gear but that there was no damage to the landing gear. This information enabled the captain of the airliner to fly it back to the airport where a landing was made without injury or mishap.

The view from the air operations tower at NAS Glynco, Ga., is that of an empty, deserted runway. For the second time in the almost-32-year history of Glynco, **runway and operations facilities are silent.** They were officially closed in August.

While plans have already been announced to use the facilities as a civilian airport, Navy Glynco has passed through a great era of Naval Aviation – the only air station to have had jets, propeller-driven aircraft, helicopters and giant airships operating from its field at the same time.

USS *Hancock,* in port at Alameda, would not have known about **the heroism of one radioman** in the communications department, had not the area's naval recruiter received a letter from the Reverend John Silvey of Burton, Texas. The letter described how RMSN Earvin A. Jenkins, home on leave in Beaumont, saved the Reverend's three children, ages 11, 8 and 7, who were caught in an undertow at a beach resort and swept out to deep water by turbulence in the wake of a power boat. Jenkins swam out to the children and gathered two on his back, clutching the third under one arm. "One of the kids helped by kicking and paddling as I swam back to safety," Jenkins says. He has received an official commendation and is being considered for a medal in recognition of his bravery.

Marine #47008 is now gone, **from the top of a mountain** near Mount Whitney, Calif., where it crashed in the winter of 1945. Until recently the wreckage remained where the Marine C-46 cargo plane crashed, although its still shiny aluminum body, picked clean by campers and hikers, would slide little by little down the mountainside every spring when the snows melted.

An eyesore from an ecological standpoint, the wreckage was also the cause for many "plane down" reports from pilots of private aircraft flying over the area. So, at the request of the National Park Service, a detachment of Marines and Seabees went up the mountain to remove the remains of the plane.

Marine #47008 made its last flight piece-by-piece. It was cut into five sections with the two engines separated from the airframe. The pieces were suspended on a 50-foot cable attached to a Santa Ana-based HMH-363 helo and flown away.


NAVY
VF-1


VAROOM
NAVAL AIR STATION
I THOUGHT NAVY PLANES WERE SUPPOSED TO LAND ON CARRIERS ANYWAY!!!

PH CS(AC) Robert L. Lawson

AICUZ

THE ROAR OF THE JET, THE CRY OF THE CROWD

By Bob Moore

Naval Aviators at most master jet bases are being pinched by shrinking airspace while their stations are being choked with uncontrolled urban sprawl on neighboring land.

The most critical problem facing today's military air stations may be inadequate zoning regulations and nearsighted developers on abutting land.

The Navy has been receiving the greatest pressure from this problem because most of its installations are in coastal areas where population growth rates of 26.3 percent exceed the national average of 16.6.

Since the Navy has an $11 billion investment threatened at 49 airfields, it enthusiastically supports a protective program which encourages the development of compatible neighbors.

The Department of Defense AICUZ program – Air Installations Compatible Use Zones – has been established in an effort to preserve operational capabilities while protecting the public from the hazards and noise associated with aircraft operations.

At times the Navy can be a noisy neighbor. Since the advent of aviation, aircraft engines have become more powerful and generally more noisy.

Although new sound reduction facilities quiet engine-testing, general noise control for military aircraft is not promising.

Two recent developments highlight the urgent need for the AICUZ plan:

- The effects of noise pollution have been emphasized by the Federal Noise Control Act of 1972.
- A California superior court jury award for damages by noise to 49 families living near Los Angeles International Airport, may set a precedent and open the door for similar suits throughout the nation.

The general policy of the DOD instruction shows the broad scope of the problem: "As a first priority step, all reasonable, economical and practical measures will be taken to reduce or control the generation of noise by flying and flying-related activities."

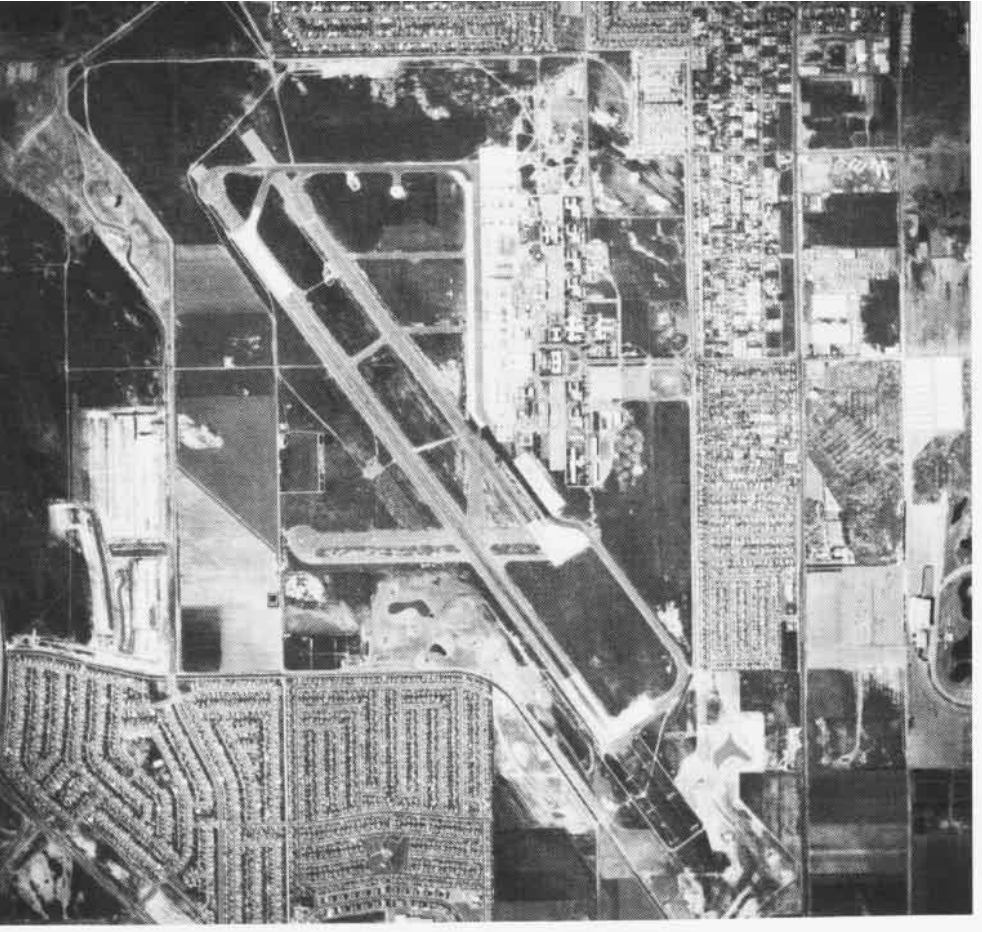
Typical measures may include locating engine test and run-up facilities in remote areas, providing proper sound suppression equipment and adjusting traffic patterns to avoid built-up areas.

"After all reasonable noise source control measures have been taken, there will usually remain significant land areas wherein the total noise exposure is such as to be incompatible with certain uses."

The 1973 instruction calls local zoning regulations the most desirable method of controlling land "since they do not remove land from the tax rolls and can achieve orderly development with minimum federal involvement."

Before the AICUZ directive, flight safety people still studied aircraft accidents. The public affairs staff still devised programs to explain aircraft noise and civil engineers updated plans to satisfy regulations.

Commanding officers met with



local organizations to answer scattered nuisance complaints and legal officers prepared zoning defenses. But, like the seven blind men examining the elephant, each had a somewhat narrow view of the environmental reality.

Now Navy representatives are speaking at public meetings to local government groups and zoning boards. They discuss the hazards to people and planes and offer advice on appropriate regulations.

Before the cry of the crowd rises to the roar of the jet, Navy spokesmen are trying to convince communities to screen their air station neighbors.

These spokesmen say that the magnitude and seriousness of the problem dictate prompt resolution. Delays will increase the complexity and cost of the solution. A cost estimate for acquiring easements to protect the Navy's jet airfields is $450 million – about the same amount required to replace one master jet base.

Navy officials stress study and acquisition of land may not seem so expensive when compared with the cost of closing down a station and moving elsewhere with the government payroll.

In one community, a station commander, who recalls the time a sky-diving club wanted to operate directly in his station's approach pattern, now consults regularly with civilians to keep up with the zoning regulations.

Now there is a good neighbor environmental master plan for all airfield communities.

AICUZ uses a Composite Noise Rating as one way to determine the adverse impact of aircraft operations.

Based on case histories of background noise levels, social, economic and political conditions, topography, flight patterns, runway length and configuration, climate and engine-power checks, each military airfield is divided into three zones with predictable community responses.

Some complaints may occur in Zone One, at the outer fringe of the airport area. Closer, in Zone Two, individuals may complain robustly and group action is possible.

Vigorous complaints and concerted group action may be expected in Zone Three, which encompasses the runway. In time, Zone Three neighbors initiate legal or political action which forces the airfield to pay, curtail or alter operations, or close entirely.

From this rating of expected community responses, it can be seen why non-compatible uses include residential areas, schools, churches and hospitals. Facilities which attract large groups of people are non-compatible because of their accident potential.

Compatible use varies in different zones. It could mean a carefully tailor-made mix of light industrial structures, storage areas, non-spectator sports or low-density recreation facilities.

The programming of these compatible use zones is being handled by a planning office in the Naval Facilities Engineering Command in Washington, D.C.

Fifteen naval air stations are now being examined by private planning consultants and all naval air installations will be studied within the next three years.

The most critical studies will be completed this fall at Miramar, Oceana, Jacksonville and Cecil Field.

NAS Jacksonville will soon complete a difficult land exchange and there is already a significant change in flight patterns at North Island. A compromise was reached with the city council on a planned new town just north of Cecil Field. Development was averted off the end of Pensacola's Chevalier Field with congressional assistance.

At Naval Air Station Patuxent River, Md., last year, Commander Jack Moger, AICUZ project officer from CNO, briefed 22 county officials, developers and businessmen. "Aircraft used to have a short takeoff distance – from 2,000 to 5,000 feet – so we bought property up to the runway. But today's new jets require a longer runway."

Two slide projectors popped on and off during the commander's hour-and-three-quarter presentation. Slides of Glenview airfield outside of Chicago showed housing developments ringing the field.

According to Cdr. Moger, Los Alamitos was "almost totally strangled by civilian growth in 1965." Due to

On opposite page, NAS Los Alamitos is surrounded by urban sprawl. Left, an F-4 Phantom II approaches NAS Oceana, the East Coast's largest master jet base. Below, Capt. Ortega "plugs" the AICUZ concept at a NavRep conference.

realignment of the reserve community in July 1971, all jet and fixed-wing aircraft were barred from the base. It now operates as an Armed Forces Reserve Center with Army helicopters.

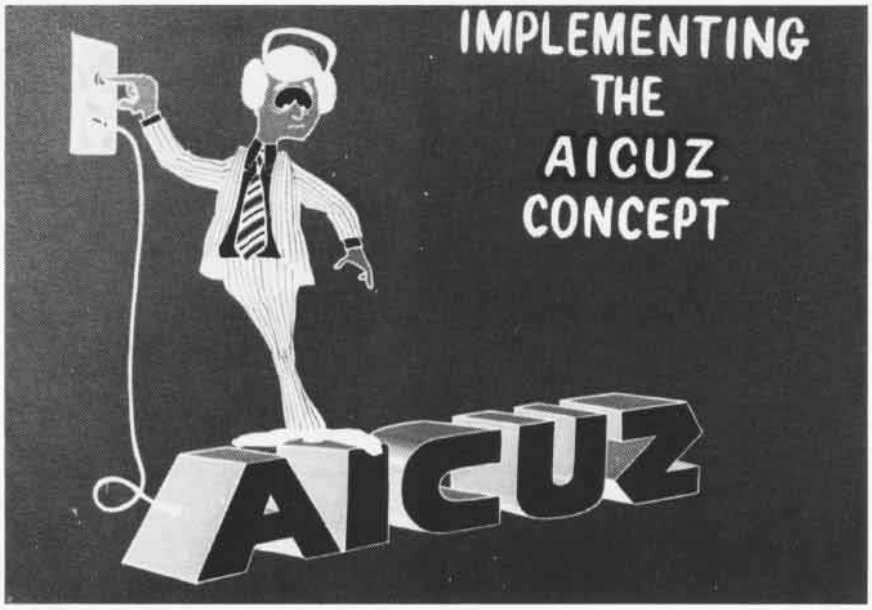
"When a base closes, it costs me and it costs you," the commander said. He pointed out how workers were laid off. He showed the high cost of relocation and replacement.

The projectors blinked again and he showed how the local economy is reduced, how property values drop and how funds are wasted. Then he talked of zoning, land exchange and land acquisition.

A development planned partially within Patuxent River's AICUZ announced it would reduce its single family units from 1,700 to 1,000. It agreed to eliminate a marina planned too close to the NAS testing area. It would donate a fire station, use noise-dampening construction measures and inform prospective buyers of noise and accident hazards.

Recently, county commissioners approved their first zoning ordinance which will limit housing density off Patuxent River runways.

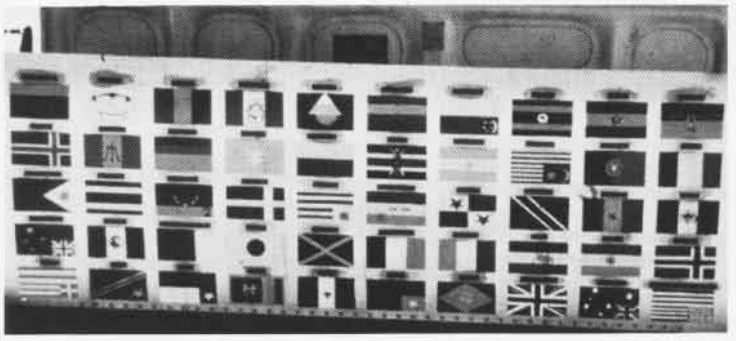
The Navy is also meeting internally. Captain Joseph J. Ortega, Head, Flight Operations for DCNO(Air Warfare), addressed Navy representatives with FAA from New York, Atlanta, Dallas, Los Angeles and Honolulu at a Washington conference on September 11. "Naval Aviators, operating 4,600 aircraft at 91 Navy and Marine Corps installations in the continental U.S., may seem like an endangered species. But we will prevail if alternatives are found to get all our demands into the finite available airspace – while ensuring an adequate level of safety for all."



AICUZ Course Number Six met on October 22 and 23 at NAS Oceana and will meet again in February 1975 to present a Navywide position on the critical problems of urban encroachment, safety and noise.

All Naval Aviation commands are being instructed to work positively with local government planning agencies toward the common goal of compatible land use development within the AICUZ.

It's not just a matter of good fences. It's a matter of good neighbors.



1+9=ONE

The Navy's newest and perhaps fastest growing air wing marked its first anniversary in July. Commanded by Captain A. W. Howard, Jr., Fleet Tactical Support Wing One (CTSW-1) was conceived to fulfill the vital needs related to support operations for the fleet. It is based at NAS Norfolk, Va., and reports directly to Commander Naval Air Force, Atlantic.

Twenty-three hundred enlisted men and 400 officers are assigned to the wing which operates a wide variety of aircraft and expects to fly 75,000 hours in FY 1975. There is such a diversity of assigned tasks within the framework of its nine squadrons that the only common ground shared by the units is their tactical support mission. These squadrons provide services which range from delivering mail to carriers to towing practice targets.

CTSW-1 has total administrative and operational control of six squadrons and either funds or has administrative control of the remaining three. Captain Howard meets regularly with commanding and executive officers of the squadrons to discuss common problems and solutions. Additionally, staff members communicate directly with counterparts in the activities. This on-going working relationship enables the wing to provide coordination between its units and liaison with other commands.

CTSW-1 also conducts administrative and material inspections of its squadrons to determine readiness levels, and takes corrective action wherever deficiencies exist. There are 95 aircraft in the wing's inventory, excluding those flown by ferry pilots in Fleet Tac-Support Squadron One.

Captain Howard feels that organization of these various support units under a functional wing command will enable them to fill voids which existed in the tactical support community in the past. Realignment is also helping to improve the career image of fleet support activities and their personnel.

In its first year the wing has ably fulfilled the aspirations of its motto: *Readiness and conservation of human and material resources through safe, efficient operations.*

"The formation of Commander Fleet Tactical Support Wing One grew out of necessity, the need to get more per dollar in service to the fleet in the face of growing economic difficulties. Our first year was one of taking a close look at our squadrons and taking measures to better ourselves. We feel we have attained a very high level of readiness and efficiency. I feel particularly gratified by the growing sense of pride evident within our squadrons. People pulling together to provide the best services possible to the fleet.

The accomplishments of our first year have been many. We have excelled in meeting operational commitments, in maintenance, in safety and in retention, but there is still much to be done. Our people work hard and long hours. Their enthusiasm and effort are unmatched anywhere in the Navy. Often our personnel serve without reward or recognition. They are dedicated and professional. I feel very strongly that they deserve better treatment from the Navy in recognition and particularly in career-enhancing orders when they leave our community."

Captain A. W. Howard, Jr.
Commander Fleet Tactical Support
Wing One

Captain Howard, who has headed the wing since its establishment, is a former skipper of VP-2, NAS Whidbey Island, and VP-1, of Whidbey and NAS Barbers Point.

VR-1

cargo/passenger airlift

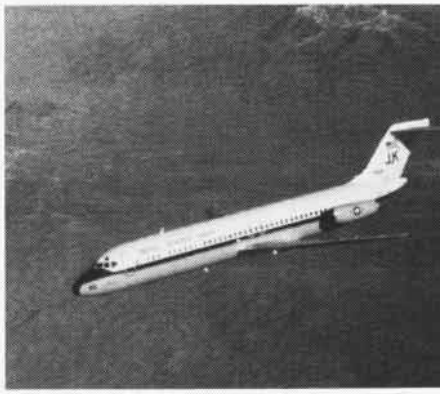
Can do - Where to? is Fleet Tactical Support Squadron One's slogan. The all-jet unit received its first C-9B in May 1973 and now has its full complement of four *Skytrain IIs* along with four CT-39 *Sabreliners.* VR-1 strives to provide first-class treatment for its passengers and this includes hot meals served inflight as well as thru-flight assistance in traveling.

Based at Norfolk, VR-1 hauls more than 100,000 people and eight million pounds of cargo two million miles annually. It maintains an around-the-clock all-weather operation with its crews working 18 hours on, 18 off, and 18 on again. Its aircraft are flown about 1,200 hours a month and the squadron has passed a 120,000 accident-free flight-hour milestone. In fact, it won the CNO Safety Award for FY 1974.

VR-1 can move entire air wings, including personnel and equipment, quickly and efficiently. Schedule changes on short notice and inflight following assistance are possible because of constant radio contact between flying aircraft and the Tactical Support Control Center located in VR-1's spaces at Norfolk.

The squadron works closely with VRF-31, another wing unit which is responsible for aircraft ferry evolutions. VR-1 planes move pilots and crewmen to various locations to ensure prompt pickup and delivery of aircraft, especially combatant types. Recently, the squadron flew its first C-9 *Pathfinder* mission. Using the Omega and inertial navigation systems, one of its transports led two divisions of A-6 *Intruders* from Bermuda to Rota, Spain.

Efforts by VR-1 have helped reduce the costly need for airline charter service. Importantly, it has also reduced transit time for fleet units and has measurably improved the image of air travel for Navy personnel.



VR-1 has four of these C-9B Skytrain IIs.

Good hot meals and service are VR-1 goals.

VRF-31

ferry operations

Aircraft Ferry Squadron Thirty-One became the Navy's sole ferry activity when VRF-32 was decommissioned in 1972. The squadron operates worldwide from its Norfolk base practicing its 30-year-old motto: *The safe and expeditious delivery of naval aircraft.* Its pilots move virtually all types of Navy and Marine aircraft from numerous bases round the clock.

CT-39 Sabreliner is used for transporting ferry aircraft crews to aircraft pickup points.

The scope and complexity of ferry operations have increased with the sophistication of today's flying machines. Squadron pilots represent a significantly versatile segment of flying professionals. Despite the requirement to fly more than 35 different models of aircraft, from the slowest rotary wing to the fastest jet, VRF-31's operations have been accident-free since March 1972. This accomplishment is more impressive considering the fact that flight hours and aircraft deliveries have increased while pilot and aircrewmen manning decreased during the period.

This summer, for the second consecutive year, the *Storkliners* received the CNO Safety Award.

VRC-40

carrier onboard delivery

Fleet Tactical Support Squadron Forty is the sole unit in the Atlantic Fleet tasked with the mission of carrier onboard delivery (COD). Its C-1A *Traders* are very welcome sights to the men of the carriers at sea for their most important cargo is the mail they bring to deployed personnel.

Additionally, VRC-40 CODs transport passengers and high priority cargo, including vital aircraft parts, to the operating ships. The squadron also routinely conducts point-to-point transport to field units, makes parachute drops and performs medevac missions. It recently passed the 30,000 hour, five-and-a-half-year accident-free milestone. Since its commissioning in 1960, it has flown more than 100,000 passengers without injury.

The unit is particularly proud of its first-term reenlistment rate of 57 percent and its barracks and working spaces which are the pride of its home station, NAS Norfolk. Its well earned motto is: *Service to the fleet with safety, dependability and courtesy.*

Cargo for CVs is eagerly awaited.

But mail is VRC-40's most important type of cargo.

VC-6

Students get technical training on MQM-74.

aerial and seaborne targets

It has no aircraft of its own but Fleet Composite Squadron Six is a close ally of flying units in the fleet. Its mission is to provide aerial and seaborne remotely-controlled-target services for the Atlantic Fleet. VC-6 detachments are also deployed to support the training requirements of the Sixth Fleet, NATO and South American Navies.

It is tasked with performing organizational and intermediate level maintenance on its target equipment in addition to providing operational and technical training for others in the Navy who control and maintain targets.

Training targets are the specialty of VC-6.

Based at NAS Norfolk, VC-6 has two permanent detachments located at Naval Amphibious Base, Little Creek and Fleet Combat Direction Systems Training Center, Dam Neck, both in Virginia. At Little Creek, the Det uses the 57-foot seaborne, powered target, SEPTAR. At Dam Neck, organizational maintenance on the MQM-74 jet-driven aerial target is performed. Dam Neck is also the operational base for flying the MQM-74 in the Virginia Capes area.

Five seagoing detachments, which function while embarked aboard ship or from remote sites on the beach, handle target commitments beyond the central Atlantic coast area.

In FY 1974, VC-6 participated in 27 exercises ranging in locale from South America to the North Atlantic. In addition, its personnel utilized surplus material and ingenuity by constructing a special launch cab at Dam Neck and a mobile control van for deployments to remote land areas.

HC-6

vertical replenishment

Helicopter Combat Support Squadron Six, also Norfolk-based, utilizes CH-46 aircraft to perform its three critical missions. It is responsible for the training and support of nine all-weather vertical replenishment detachments which service units in the Atlantic and Mediterranean. It conducts the Atlantic Fleet Helicopter Operations School where officers and enlisted personnel receive helicopter orientation and familiarization training. Thirdly, it provides direct support for the Commander-in-Chief, Atlantic Fleet, by transporting personnel from the Norfolk headquarters complex to and from the Navy's senior commands in Washington, D.C.

Commissioned on September 1, 1967, HC-6 also conducts numerous utility missions in the Atlantic operating areas and supports recruiting districts throughout the eastern U.S.

One of its key accomplishments has been the training, at its school, of 840 LSEs (landing signalman enlisted) from 177 different commands in FY 1974 (*NANews*, April 1974). Usually six of its detachments are deployed aboard Atlantic Fleet ships. HC-6 received the CNO Safety Award for the second consecutive time in FY 1974.

CH-46 Sea Knight conducts vertical replenishment for ship underway in Mediterranean Sea.

VQ-4

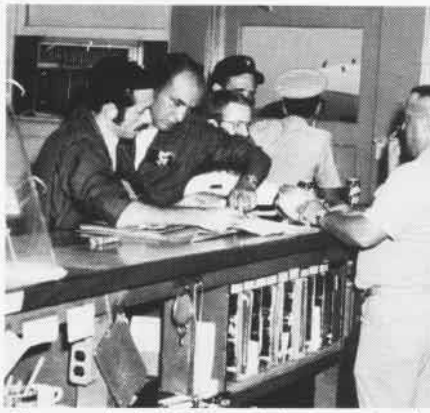
communications link

Fleet Air Reconnaissance Squadron Four has a complement of nearly 500 officers and men flying the EC-130 *Hercules* on a demanding round-the-clock schedule throughout the North Atlantic Basin. Its primary mission is to provide a mobile backup system for the Navy's shore-based communications stations and other defense activities in the event of a national emergency. This would ensure that fleet commanders would be able to communicate with operating forces at sea. At least one of VQ-4's aircraft is on station over the Atlantic 24 hours a day, 365 days a year.

The squadron was commissioned on July 1, 1968, and has installed the complex TACAMO III/IVB communications system which was developed for the Naval Air Systems Command by the Collins Radio Company.

VQ-4, based at NAS Patuxent River, also operates a trainer unit which simulates the communications system and is a valuable tool in the training of replacement officers and enlisted personnel for both its own use and that of VQ-3.

The word TACAMO was originally an acronym assigned by a Marine colonel then on the CNO staff. It was derived from the motto: *Take charge and move out.* VQ-4 does just that.



Aircrews check C-130's maintenance record.

EC-130 Hercules aircraft of VQ-4 provide round-the-clock communications for Defense units.

VXN-8

oceanographic and geomagnetic research

Crewmen and technical specialists monitor instruments and record data on a research flight.

Oceanographic Development Squadron Eight is the Free World's only aviation squadron devoted solely to airborne oceanographic and geomagnetic research. Although it is funded by Fleet Support Wing One, principal administrative control and technical direction are maintained by the Naval Oceanographic Office and the Defense Mapping Agency. It is based at NAS Patuxent River, Md.

VXN-8's principal tasks include three major operations now in progress.

Project *Magnet* involves the collection of worldwide magnetic data required for ASW warfare and other scientific programs of the U.S. and its allies. The information is used in making isomagnetic, nautical and aeronautical navigation charts and to construct orbital navigations systems such as those used in the space program. An RP-3D, christened the *Roadrunner*, is a one-of-a-kind aircraft which was specifically configured to handle the *Magnet* mission.

Oldest of the three projects, it was established in 1951 by CNO. From 1962 through 1972, an NC-121K dubbed *Paisano Dos*, which loosely translated means "The Friend," was flown worldwide doing research. *Roadrunner* replaced it in January 1973.

In Project *Birdseye*, an RP-3A *Orion* is flown over the frigid expanse of the Arctic Basin and marginal seas to collect environmental and polar ice data. The information is required for fleet operations, under-ice exercises, advanced weapons testing, annual Arctic resupply efforts, ASW undersea warfare activities and mine warfare.

The type, distribution and boundaries of ice are recorded. This data is vital for under-ice exercises, weapons testing, topographical charting, ice prediction services, allied military needs, DOD projects of national interest and the annual Arctic resupply effort.

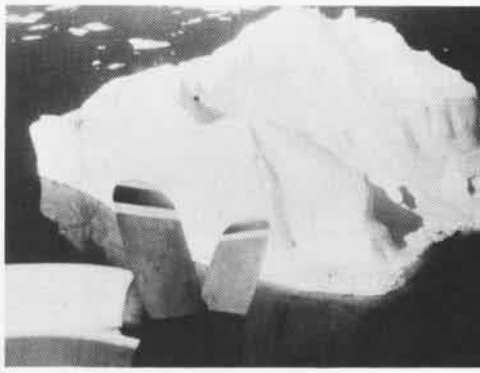
Various sensors, which include an infrared scanner, a laser terrain profiler and an airborne radiation thermometer, as well as visual ice observations, are employed in the data collection process.

There are eight to ten *Birdseye* deployments each year and the *Arctic Fox*, as the RP-3A is called, flies from bases in Alaska, Labrador, Newfoundland, Iceland, Greenland and Norway. *Birdseye* also assists in forecasting seasonal ice flows which helps the shipping and fishing industries.

El Coyote is the RP-3A *Orion* which spearheads Project *Outpost Seascan*, the third of VXN-8's major activities. It's a worldwide project conducted in conjunction with the ASW Prediction Services (ASWEPS). In past years, an NC-121K helped study the acoustic and thermal characteristics of the North Atlantic Ocean in order to improve environmental forecasting techniques vital to ASW work.

Particular areas of concern for *Seascan* are temperature distribution, currents, eddies, frontal zones, acoustic parameters, bottom reflectivity, volume reverberation, ambient noise, ocean waves, biological activity and accurate pollution detection.

Information gathered is used on navigational charts and space projects to verify satellite weather predictions, to aid in the detection of mineral deposits, to chart coastal waterways, and is also used in sonar studies and by the fishing industry.



Orion, one engine feathered, passes iceberg.

Of particular interest is the Gulf Stream which has always presented a stern challenge to naval commanders because of erratic temperatures. A submarine can "hide" in the relatively warm water of the Gulf Stream and drift hundreds of miles undetected. *Seascan* is using many different sensors in an endeavor to develop techniques to deny submarines this natural hiding place.

Interestingly, it was VXN-8 which recently detected the long-sought wreckage of the Civil War ship, *Monitor*, off the Virginia Capes.

VAQ-33

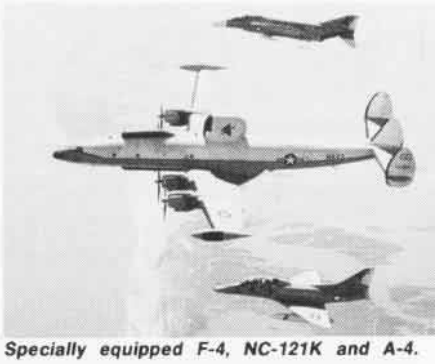
electronic warfare environment

Tactical Electronic Warfare Squadron Thirty-Three is tasked with providing realistic, hostile, electronic warfare environments for the training of both Atlantic and Pacific Fleet forces.

It utilizes four types of aircraft, specially configured for missions. These include ERA-3B *Skywarriors*, EA-4F *Skyhawks*, F-4B *Phantoms* and an NC-121K *Constellation*.

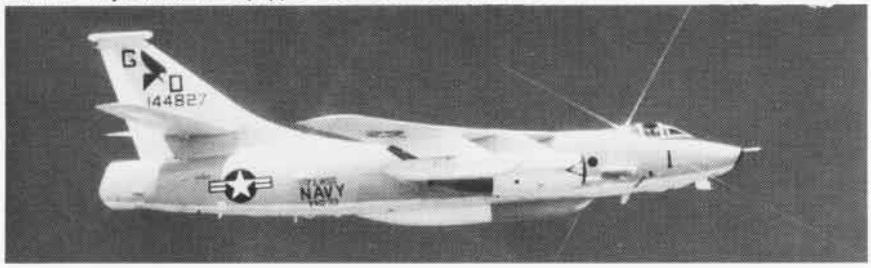
VAQ-33 crews are experts at creating predicated hostile-type threat environments which help operational units evaluate their tactics. The squadron flies reconnaissance and surveillance type missions and uses radar and communication jamming techniques, chaff dispensing maneuvers and various deception tactics.

Based at Norfolk, VAQ-33's detachments have participated in major exercises from the mid-Pacific to the Mediterranean. Additionally, the activity provides its vital services to allied nations as well as military units other than the Navy.



Specially equipped F-4, NC-121K and A-4.

ERA-3B Skywarrior is equipped for ECM electronic countermeasure warfare missions.



VC-2

target towing

Fleet Composite Squadron Two, based at NAS Oceana, Va., provides aircraft services to the fleet for readiness training and proficiency. With 17 A-4 *Skyhawks* and eight S-2 *Trackers* averaging more than 20 sorties daily, VC-2 conducts radar and fire-control tracking exercises, and tows airborne targets for air-to-air as well as surface-to-air gunnery practice. It also performs radar-vectored air intercept exercises and various missile profile tracking exercises. The squadron also operates the FIGAT (fiberglass aerial target).

Other missions include aerial tanking and flying simulated aircraft attack maneuvers to help train ships' gunnery crews and other airborne commands.

In recent exercises, squadron pilots provided gunnery and missile target services for the F-14 *Tomcat*, the Navy's newest fighter.

VC-2 holds the distinction of having one of the Navy's first female flyers, Ens. Rosemary Conatser, assigned for duty.

An S-2 Tracker is framed by VC-2 Skyhawks on Oceana's flight line.

This fiberglass aerial target is towed for fleet gunnery exercises.


VRF-31


FLECOMPRONSIX
SKEET FOR THE FLEET


FLEET TACTICAL
SUPPORT


FAIRECONRON FOUR


1
FLEET TACTICAL SUPPORT WING


VAQ-33


VRC-40 COD


FLECOMPRON TWO WILL DO

HC-6


SQUADRON
INSIGNIA


OCEANDEVRON EIGHT

NAVAL AVIATION
NEWS