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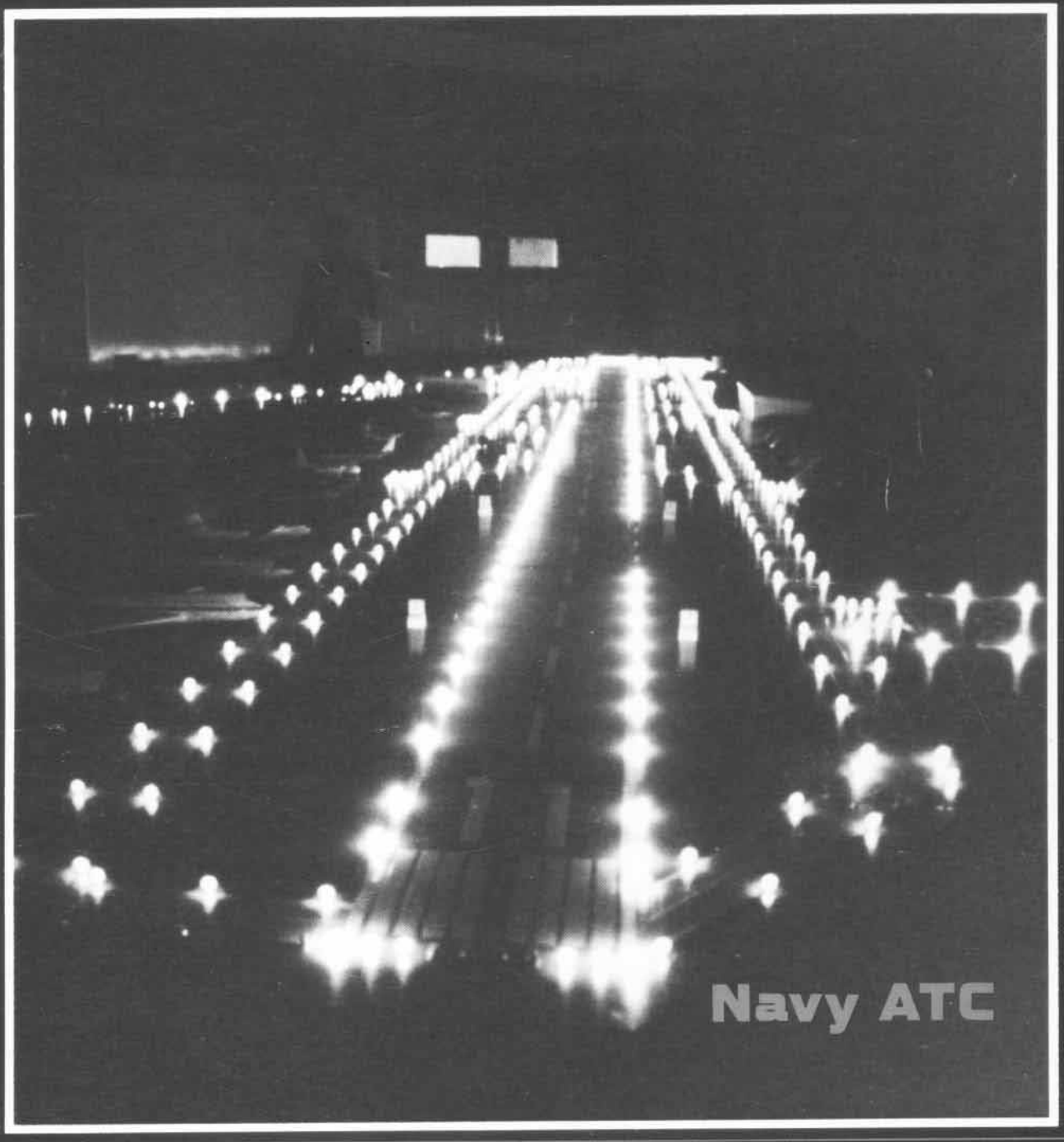
NAVAL AVIATION NEWS



Navy ATC

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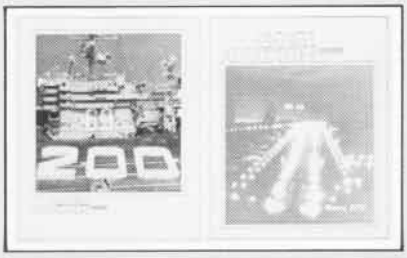

COVERS—Front: JO2 Julius L. Evans filmed this mock runway used for air controller training at NATTC Millington, Tenn. Back: USS *Eisenhower* crew saluted *Constitution's* anniversary. Photo by AN Doug Houser.

Features

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The Navy air traffic control "A" school, NATTC Millington, Tenn., trains students in this highly specialized field. Graduates are prepared to exhibit "One Class "A" Act" as they go into the fleet to tackle controlling the skies. **Page 4**

Since 1946, TACRONs have been "A Vital Link in the Navy's Chain," which connects the various communities. These squadrons coordinate and control the air support from all services during an amphibious landing. **Page 7**

Cdr. Jim Calhoun is the Navy liaison to the FAA who works on the National Airspace System Plan. In an interview, he discussed the importance of the DoD-FAA partnership in controlling today's crowded airways. **Page 11**

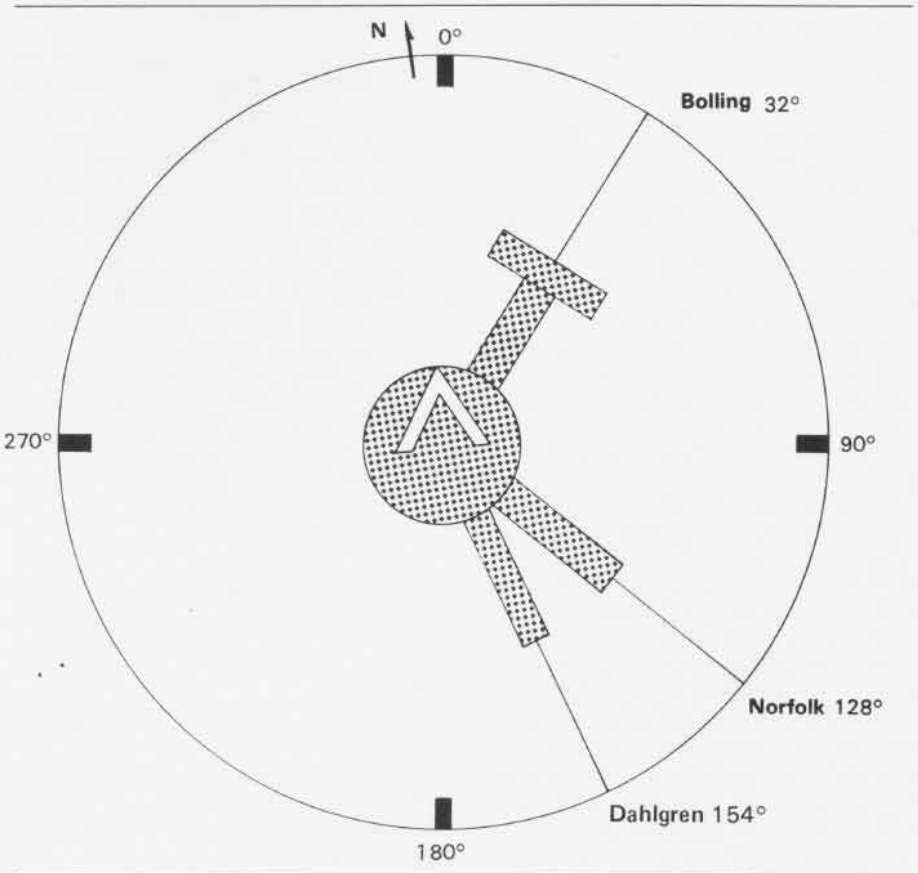
The E-2C is the Navy's most advanced and sophisticated airborne tactical data system designed for carrier operations. Carrier Airborne Early Warning Squadron 120 trains Naval Aviation personnel using the *Hawkeye,* and the C-2A *Greyhound,* in its mission of "Sharpening the Eyes of the Fleet." **Page 14**

For 35 years, the A-3 *Skywarrior* has been flown by the Navy in a variety of roles. Its designer, Ed Heinemann, recounts the aircraft's history in "A Whale of an Airplane." **Page 18**

A squadron's aircrew turnaround training cycle requires complex planning for proper execution. Former VF-11 skipper, Cdr. Mike Robinson, explained the process. **Page 22**

Homegrown ATC

By John M. Elliott



When man first succeeded in achieving flight, the need for a means to control aircraft became imperative to ensure safe passage in the skies.

We often think of air traffic control as a rather modern development in aviation. However, even before the advent of radar, instrument approach systems and radio communication, the safe conduct of cross-country flights was of supreme concern.

One means of providing a pilot with in-flight weather information in the early 1920s was the Block System established by the Army Air Service in 1921. Using block signals for the control of airplane traffic, the system was installed at various locations on the East Coast, such as Langley Field, Hampton, Va.; Bolling Field, Anacostia, Washington, D.C.; Aberdeen Proving Ground, Aberdeen, Md.; Mitchell Field, N.Y.; Langin Field, Moundsville, W. Va.; and McCook Field, Dayton, Ohio.

This is how the system worked. An airplane flying from Langley Field to Bolling Field would fly over the Naval Proving Ground, Lower Station, Dahlgren, Va., where the Bureau of Aeronautics had installed a blocking signal at the request of the Army. A second signal was later built at the Marine Flying Field, Quantico, Va. What the pilot saw from the air was similar to the illustration. When a "block" (cap on the T) across the arm pointed to Bolling Field, the pilot knew that it would be hazardous to continue his flight in that direction and that he must land immediately or divert his course to one of the headings not blocked.

A radio net was eventually established with headquarters at Bolling Field to transmit meteorological information to all stations using the system. The pilots on duty at these fields were familiar with the system, its purpose and the method of operation. When flying over any field which had a block signal installation, pilots were directed to note in their flight report whether the arm indicating the direction of the flight was "clear" or "blocked."

The signal installation was made of concrete, lumber or brick and lay flush with the ground. It consisted of a 28-foot-diameter circle painted white with black one-by-two-foot rectangles located on the perimeter pointing toward the center at 0, 90, 180 and 270 degrees *true.* The inner circle was six feet in diameter and painted a deep orange. In the center was a right angle with its apex pointing true north and touching the circumference of the inner circle. The legs of this pointer were one foot wide and painted white. The arms which pointed in the direction of a route to the next station were three feet wide, extended nine feet from the outer edge of the inner circle, and were also painted deep orange. For the signal at Quantico, the arms were to radiate at angles of 32, 128 and 154 degrees.

The blocking signal itself was 3 by 12 feet, made of wood, and painted white on one side and deep orange on the other. When not in use, it was stored on an open portion of the white signal with the white side up. When in the "stop" position, the orange side was up with an equal portion on either side of the radiating arm indicating the course which was to be blocked.

The Block System was initiated at a time when ingenuity often took the place of unavailable funding. At Commander T. G. Ellyson's suggestion, the signals were built from old crates or scrap lumber, and the labor was performed by enlisted personnel.

The thought of a group of men moving a 3-by-12-foot wood platform each time poor weather conditions developed on any one of three flight paths seems ludicrous today. It is a far cry from the air traffic control system that we now take for granted, but it was a positive step to make the highways of the sky safe for flight. ■

Conflicting Communications

An A-6 *Intruder* was inbound to NAS Green, which is located in the same geographic area as NAS Blue. Weather was clear. The duty runway, 24.

Approach Control asked the A-6 to report the field in sight. At 20 miles east, the pilot did so and was directed to contact the tower. No specific frequency was given. The BN dialed in a secondary frequency listed for NAS Green's tower in the IFR Supplement. NAS Green was not monitoring this frequency; however, NAS Blue tower was, and transmitted a garbled response to the A-6 after the pilot checked in.

The *Intruder* closed to 12 miles and requested clearance. NAS Blue said, "Continue for a straight-in to runway 29." The pilot requested clearance to runway 24. The tower replied, "Report the numbers, runway 29."

Meanwhile, NAS Green was aware the A-6 was inbound but couldn't reach the aircraft on its primary tower frequency or UHF guard. NAS Blue then asked the *Intruder* if it was a prop or a jet, and what type of aircraft. By the time this was determined, the *Intruder* was over the numbers for runway 24 at NAS Green. The A-6 was cleared to break by NAS Blue!

The aircraft broke and turned downwind for runway 28, believing it to be runway 29. The crew reported "Abeam, gear, full stop." NAS Blue transmitted " . . . not in sight, cleared to land."

The tower at NAS Green saw the A-6, continued to broadcast on tower primary and guard, and gave light signals but communications were not established. Convinced the aircraft was going to land on runway 28, NAS Green issued a waveoff and warned all ground vehicles to stay clear. The *Intruder* came around and made a normal landing on 28.

The A-6 never called NAS Green specifically by name and NAS Blue did not identify itself by name, except on one of the final transmissions of this event.

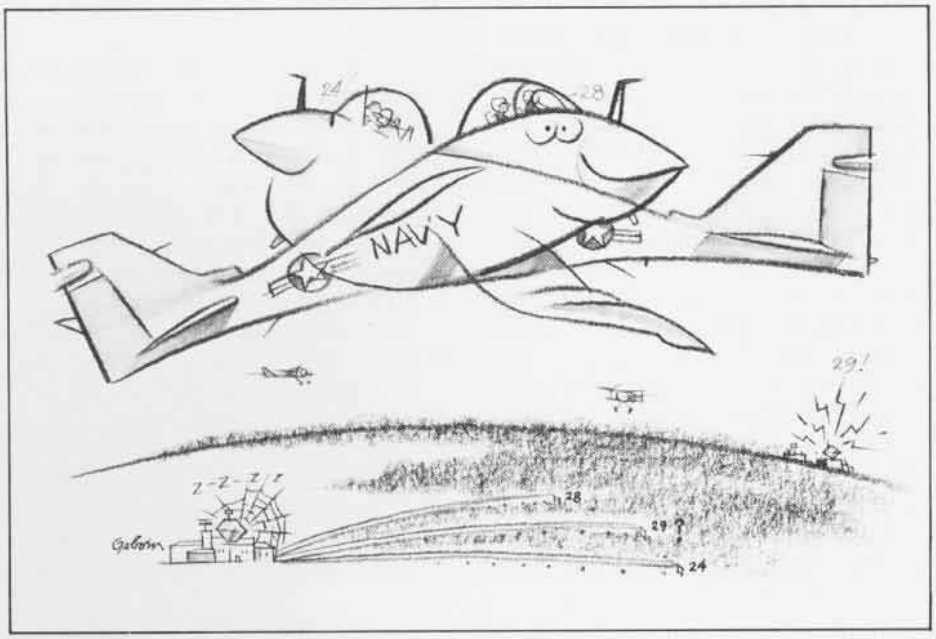
The IFR supplment denotes runway 28 for emergency use only. Happily, the weather was good, the pattern was empty of other aircraft and vehicles were safely out of the way.

Grampaw Pettibone says:

Confusin'? You bet. The players in this "episode" must have been dozin' off.

Most of you read about the airliner that landed at the wrong airport awhile back. Raised a heckuva fuss. In my younger days when airplanes had two wings, one above the other, and fresh-air cockpits so that scarfs streamed in the breeze, settin' down at the wrong airstrip was worth a few chuckles and a hearty toast to the grand and fearless spirits of aviation.

No more. In this case, lack of proper communication and double checks could have led to a disaster. Traffic was light, weather was sunshiny, and all seemed well with the world. The folks involved were lucky. The *Intruder* landed at the intended airport alright, but you'd have a tough time convincing NAS Blue of that.



Back to Basics

A highly experienced pilot in a tactical jet was approaching the lead aircraft during a night rendezvous. The wingman's relative bearing appeared to be normal but he had difficulty affecting the final stages of the join-up. He could not seem to close the last distance to achieve proper formation position. After a time, he adjusted his scan pattern, checking in particular his altitude. He then realized he had lost height during the rendezvous and failed to recover it. Thus, his airplane remained well below the leader for an embarrassing length of time before he recognized the error and took corrective action.

In a similar case at night, a pilot joining on another sensed that he was pulling up into and banking precariously toward the lead plane. His gaze was mostly out of the cockpit. In reality, he was pulling down and away from the

ILLUSTRATED BY Osborn

leader. He departed the aircraft which then entered a spin. The pilot ejected safely.

Grampaw Pettibone says:

Gol dang it! My whiskers are afire and asmokin'. There've been too many such reports lately. A trend is developin' and I don't like it.

We're forgettin' the basics — fly the aircraft, scan those instruments, pursue precision.

I know we've dropped the instrument RAGs, and that most training on the gages is done within the squadrons these days. Instrument flyin' ain't fun. It's 100-percent work. But it's the kind of work that can save your skin, not to mention a flying machine.

The pilots in the above cases didn't use their instruments. Sure you gotta look outa the cockpit. But cross-check *inside* the cockpit, too! They trusted in the old Mark I eyeball and forgot what the gages could do for 'em. On top of that, demon vertigo had himself a fine time.

"Reasonable people know that the dials and pointers (in the cockpit) are put there to be looked at, according to a regular pattern adapted to what the aircraft is supposed to be doing at the time." Ole Gramps put those words to parchment in 1954, before a lot of you troops out there checked aboard. But the message still rings true. I said somethin' else way back then, and repeat it here:

"You were told at the very start that instrument flying can be summed up in terms of two attitudes: yours and the aircraft's."

Think about that. Pursue precision. Don't settle for 50 feet above altitude, or five knots fast, or 27 degrees angle of bank when you need 30. And scan, scan, scan!

Crazy Capers

A 737 was climbing out to 10,000 feet after takeoff into the clear Alaskan sky. The crew spotted a large bald eagle circling forward and above the airliner. An air carrier safety inspector conducting an aircrew check noted, "I could see that we were going to pass under the eagle with plenty of separation but, as we did, we heard a large thump from the left side of the fuselage near the forward entrance door.

"Did we hit that bird?" asked the captain.

The FAA man didn't think so, unless there was a second bird in the same airspace. The 737 was apparently unharmed so the flight continued to the intended destination, the crew alert to any malfunction that might arise from the "hit."

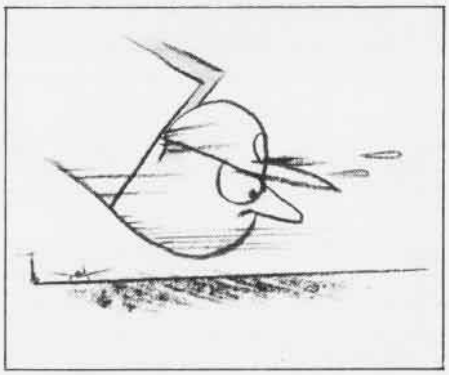
Landing was normal but, after shutdown, a perplexed maintenance crew found the remains of a four-pound salmon "wedged in near the forward door and the wing root."

The FAA inspector said, "There was no doubt about it; that was one smart bird! At that altitude, carrying a large fish was enough of a chore without taking on a 737." The eagle, needing extra lift, had surrended his dinner to the airplane rather than risk collision with the metal monster.

(FAA World recounted this unlikely fish story.)

A small passengerless transport was 4,000 feet over water when the pilot turned the controls over to the copilot so that he could go aft and check a rattle in the stairway door. As he was examining the door, the aircraft passed through turbulence. The door flew open.

The copilot looked back, couldn't see his partner, and feared he had fallen from the aircraft. He declared an emergency and asked that the Coast Guard be informed. The copilot proceeded to the airfield, made a normal landing, and parked the aircraft. He was stunned and elated to find that the pilot had clung to the stairway door and was alive! Apparently, when the door opened, the pilot grasped the cable railings as he fell onto the steps. He held on for dear life, his body oriented so that his head was toward the lower step. It was calculated that during landing, with speed at 100 mph, there was a clearance of six inches between the pilot's head and the runway.



Grampaw Pettibone says:

Once you think you've heard everything . . . you haven't!

Some NATTC air traffic control school graduates may eventually spend a tour of duty in the NAS Memphis, Tenn., tower.

Navy Air Traffic Controllers —

Story and Photos by JO2 Julius L. Evans

The nation's air travellers were in a state of panic on the morning of August 3, 1981. Total dismay followed when President Ronald Reagan fired more than 11,000 Federal Aviation Administration (FAA) air traffic controllers during the midst of turmoil between the administration and the controllers and their labor union.

Some of the controllers' Navy counterparts were diverted from their normal everyday mission of trafficking military aircraft to directing civilian 747s and DC-10s. The year 1981 proved to be critical for the air traffic control community. Although the controllers decided to strike, flight schedules of many airliners were not changed.

The seriousness of the problem made it immediately apparent that trained and skilled air traffic controllers had to be called in, and fast!

Once again, the U.S. Navy rose to meet a challenge that called for the skills of its highly trained and qualified technicians. These vital military personnel received their training at the Naval Air Technical Training Center (NATTC), NAS Memphis, Millington, Tenn.

Commanded by Captain John F. Healy, NATTC Millington is the largest Naval Aviation training activity in the world, with 20 aviation schools under the command. The air traffic control schools are comprised of maintenance and operations courses, which provide both basic and advanced instruction in the operational control of aircraft and in the maintenance and operation of associated electronic equipment.

More than 20,000 technical students per year march the grounds of NATTC Millington. Of these, some 500-plus students per year leave the grounds with their air traffic control specialist certificates and successful completion of the FAA's airman's written test for control tower operators — the required licenses to begin control of aircraft in the fleet.

The process of becoming an air traffic controller begins long before a student arrives at the NATTC Millington training grounds. He or she must first meet the Armed Services Vocational Aptitude Battery test score qualifications prior to being considered for the highly professional and skilled field.

Next, the student must pass an aviation flight physical to ensure he is physically qualified and mentally adaptable for the rigorous duties of an air traffic controller. Each air traffic controller graduate must pass an aviation flight physical annually and have a current NAVMED 6410/2 clearance notice, signed by a naval flight surgeon, on file.

Once on board NATTC, the student is assigned to a regiment that is similar to the chain of command of a regular squadron. NATTC Millington is an extension of recruit training in that the student receives monthly personnel inspections, general military training lessons and continues to march. Like boot camp, a company commander

"We're not saying that when a person leaves this school he is a qualified air traffic controller, but that person has proven that he has learned enough to go into the fleet and, with instruction, become a qualified controller."

presides over the barracks and is like a parental figure.

Three times a week, the NATTC student participates in a physical fitness program. The company commander, usually a first class petty officer, musters the company at 0520, leads them through a series of warm-up exercises and then on to a three-mile run. Afterwards, the students don their uniforms and eat breakfast, but must return to the barracks in time to march to class with the rest of their company. During the fall and winter months, physical fitness training is conducted after school, commencing at 1620.

The air traffic control "A" school course covers the fundamentals, rules and regulations of the air traffic control system. Simulated operational experiences prepare the student to function as an apprentice air traffic controller in an operational control tower and/or terminal radar environment.

"A" school is a 14-week, group-paced course that is divided into four separate blocks of instruction. Each student is required to pass every test before continuing on to the next block of training.

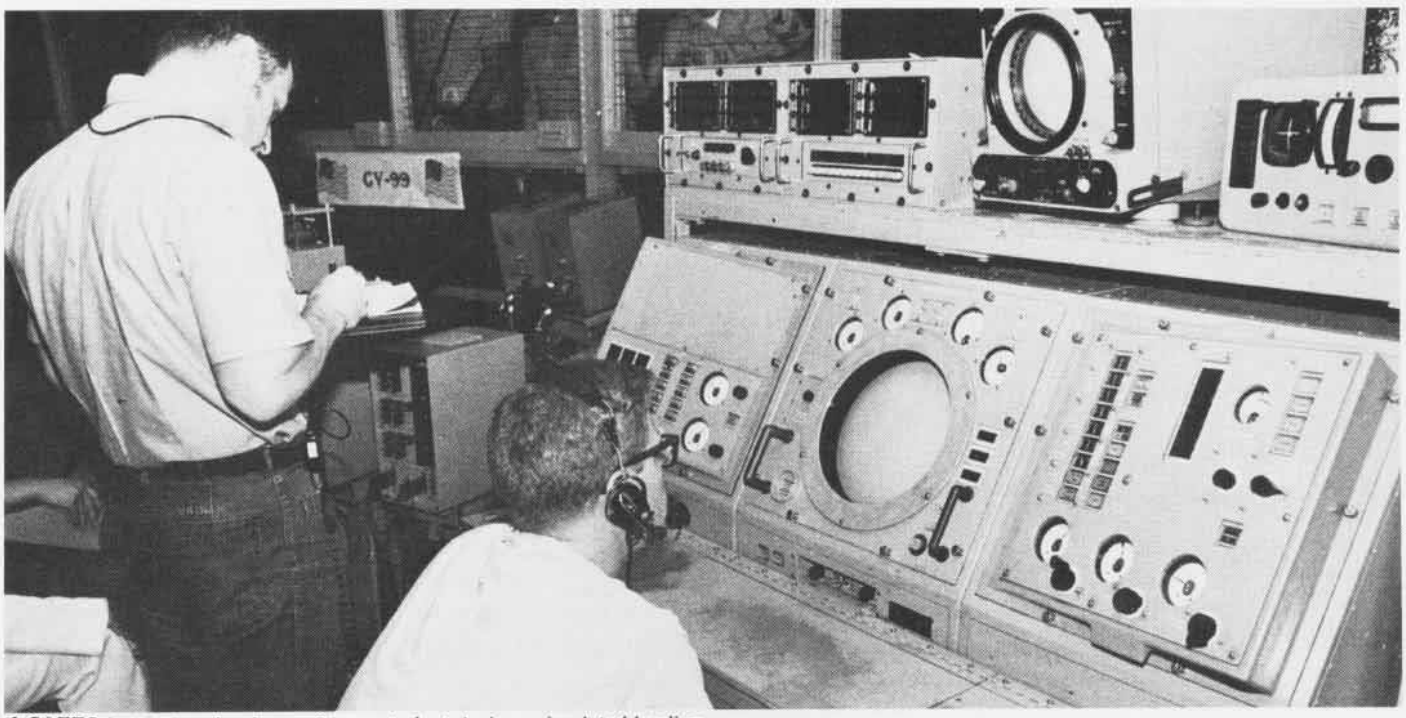
Block one, the first week and two days of instruction, gears the student toward passing the FAA airman's written examination. Here, he concentrates on control tower operations, radar and non-radar operations, high and low airway structures, minimum safe altitudes, navigational aids and weather phenomena.

Block two, three weeks and one day long, consists entirely of classroom instruction and tests. The student commences a more in-depth and detailed study of air traffic control fundamentals, navaids, aviation weather, charts and publications and flight plans. During the charts and publications and flight plans phases, of instruction, the student receives hands-on instruction by actually working with aeronautical charts and processing flight plans.

Block three, four weeks and four days in length, combines classroom instruction and laboratory working environments. The first three weeks and three days of block three consists of classroom periods covering lessons in basic aerodynamics, general control and terminal equipment, and VFR and IFR procedures.

The last week and two days of block three are spent applying the knowledge learned in a simulated control tower laboratory. The laboratory phase is divided into two separate labs, static and advanced control tower. In the static lab, the student learns the airfield layout, operating positions and phraseology to be used upon entering the large control tower lab. The advanced control tower lab allows the student to operate as a flight data technician, ground controller and a local controller. Each student rotates through each position, and all students learn the importance of total commitment to teamwork.

One Class "A" Act



A CATTC instructor closely monitors a student during a simulated landing.

Block four, four weeks and three days in length, is the student's final learning block. It combines classroom instruction with laboratories, in four phases: identification and vectoring, air surveillance radar (ASR) approaches, precision approach radar (PAR) approaches, and arrival control.

In the identification and vectoring phase, the student receives classroom instruction on basic radar theory, identification (primary and secondary) procedures, vectoring procedures, traffic calls and equipment setup and usage. In the ASR phase, the student learns coordination with tower and procedures involving airport surveillance radar, lost radar, no-gyro, and tower clearance. The PAR phase continues the student's final control learning process. The student learns how to conduct precision approaches utilizing a split-screen presentation depicting an elevation and an azimuth scan. The arrival control phase is the most complicated and difficult one. The student is required to remember and apply lessons learned in the first three phases plus separation, hand-off, emergency and special-handling procedures. Before this phase, the student has only been responsible for controlling one aircraft. In the arrival phase, the student must control three aircraft while applying all the correct rules and procedures learned throughout the school.

Night study is available should a student develop problems that cause him to fail any of the tests throughout the course. However, night school is not strictly for students with problems. It's a learning tool that can be used by any air traffic control student during set study hours to develop a better understanding of the material learned or to answer any questions the student may encounter.

The newly rated air traffic controller is in a continuous learning mode. Once leaving NATTC, he must start location training after reporting to his new command. From the time he reports, the new member of the air traffic control team will undergo one-on-one training with a senior controller to familiarize the trainee with the base's operating procedures and policies.

"The air traffic controller rating [AC] is one of the few ratings that require a person to requalify before actually doing the job he has spent months learning," said Lieutenant Mike Thompson, air traffic control schools training officer.

Learning to direct traffic at a particular base depends upon the amount of traffic which that base normally controls and the complexity of the facility's operations. Complete facility certification, including ground, air and terminal operations, may take from six months to a year or more.

Upon assignment, a student's NATTC training ensures that his command is receiving a trainable technician, who is capable of adapting to a new environment and applying the universal knowledge of air traffic control at the land base.

"We're not saying that when a person leaves this school he is a qualified air traffic controller, but that person has proven that he has learned enough to go into the fleet and, with instruction, become a qualified controller," said Air Traffic Controller Senior Chief Eugene Streicher, operations training division leading chief petty officer. "We're sending the fleet trainable personnel."

For the fleet sailors already designated in the AC rating, there are other advanced air traffic-related schools housed at NATTC. They provide instruction in facility management, terminal radar air control, carrier air traffic control and carrier air traffic control team training, all of which are "C" class schools.

Although the NATTC "A" school graduate has a long way to go before actually controlling the airways, he can rest assured that one day, because of the training received at NATTC Millington, he will be in control. ■

CATCC — The Heartbeat of Flight Operations Afloat

By JO2 Julius L. Evans

The air traffic controller who reports to an aircraft carrier must be prepared for one of the most demanding jobs in an already high-tempo field. He's en route to the ultimate air traffic control experience and, for this, more specialized training is required before reporting to the ship.

The carrier air traffic control center (CATCC) is the heartbeat of flight operations afloat. CATCC is a six-week "C" class school. The student spends a week and a half of classroom instruction covering phraseology, procedures, organization, administration, equipment and CATCC watch-stations. The remaining four and one half weeks take the student through a highly sophisticated state-of-the-art CATCC mock-up laboratory where they receive hands-on instruction in controlling aircraft during simulated fleet launch and recovery operations.

In one-on-one instruction under the close eye of an experienced CATCC controller, the student trains at the departure, marshal, approach and final control positions. In addition, he keeps track of flight profiles and information on three separate status boards. A unique challenge here is learning to stand behind the board and write backwards. This skill comes as second nature within a couple of hours' practice.

The departure control position monitors the aircraft from radar contact, immediately after takeoff, until hand-off to another agency. Additionally, the departure controller coordinates refueling operations between the overhead tanker and low-fuel aircraft.

The marshal controller stacks inbound aircraft in holding patterns and issues control instructions to choreograph a safe, orderly flow of aircraft in the initial phase of the recovery operation.

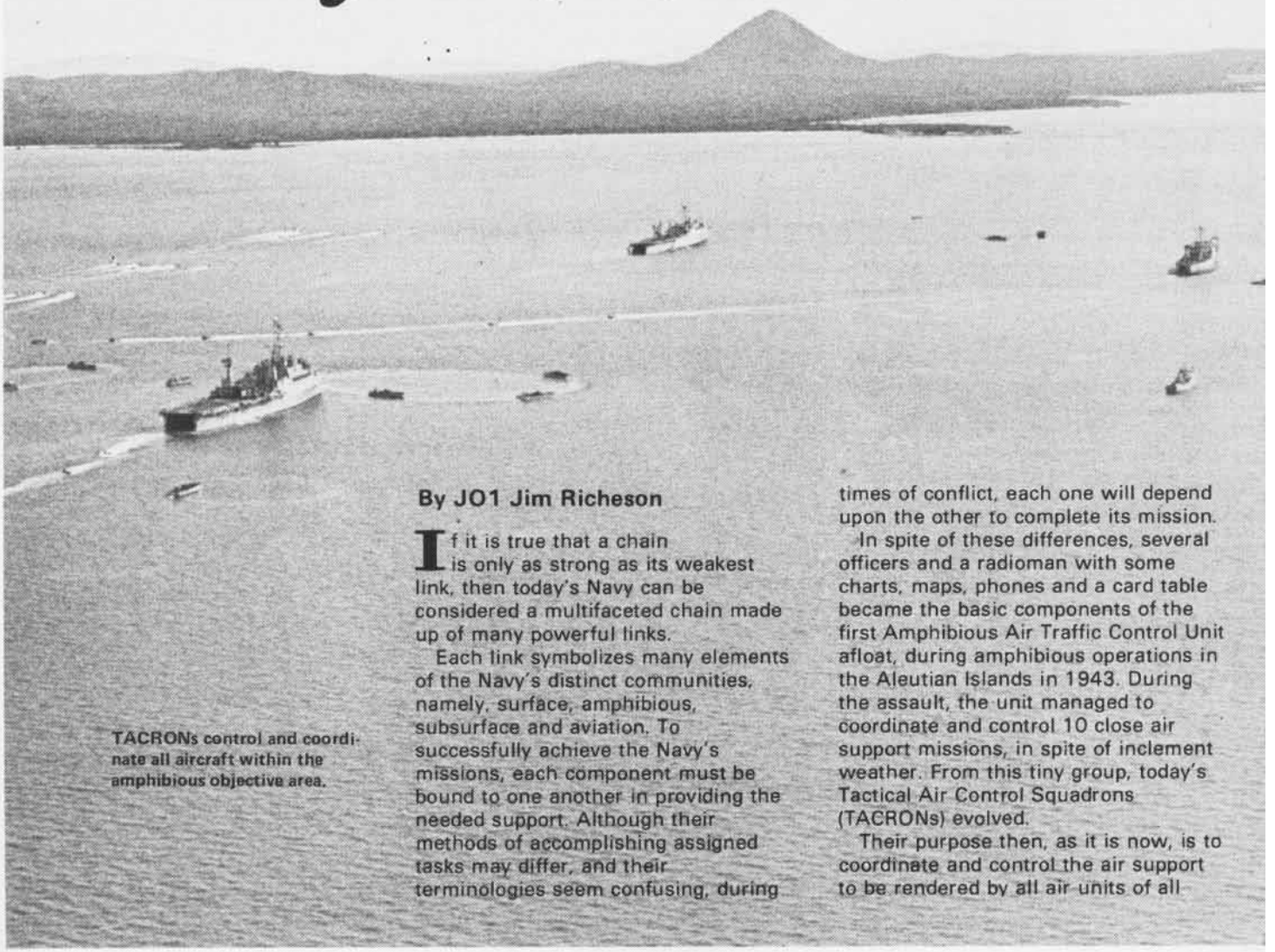
The approach controller takes control of aircraft from the marshal controller approximately 20 miles behind the ship and issues control instructions as needed to assist the pilot in setting up for a final approach. High-speed jet aircraft, flying at close intervals, quicken the pulse of even the most experienced approach controller. It is a bonafide true grit position of responsibility.

With the use of precision approach radar, the final controller issues control instruction to the pilot to fly the last six to eight miles maintaining a proper course and glidepath ratio to make a safe landing in all weather conditions. Some aircraft are equipped to make a MODE I approach to the deck. This is done via a data link system of computers, one on the ship and one in the cockpit.

The unique air traffic control situation aboard a carrier gives Navy ACs specialized experience which is unequaled anywhere in the world.

PH1 John R. Sheppard

TACRON
A Vital Link in the Navy's Chain



TACRONs control and coordinate all aircraft within the amphibious objective area.

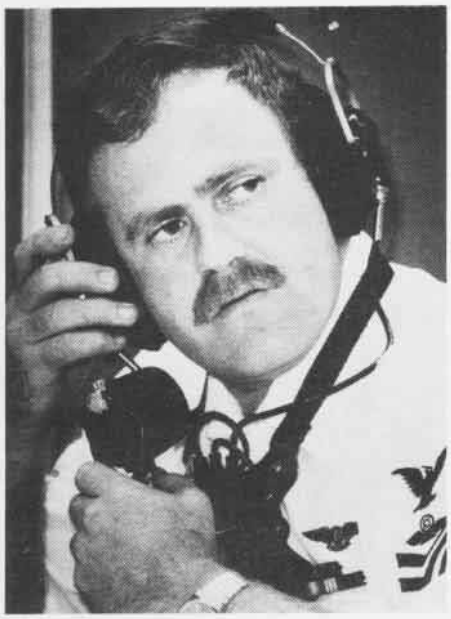
By JO1 Jim Richeson

If it is true that a chain is only as strong as its weakest link, then today's Navy can be considered a multifaceted chain made up of many powerful links.

Each link symbolizes many elements of the Navy's distinct communities, namely, surface, amphibious, subsurface and aviation. To successfully achieve the Navy's missions, each component must be bound to one another in providing the needed support. Although their methods of accomplishing assigned tasks may differ, and their terminologies seem confusing, during times of conflict, each one will depend upon the other to complete its mission.

In spite of these differences, several officers and a radioman with some charts, maps, phones and a card table became the basic components of the first Amphibious Air Traffic Control Unit afloat, during amphibious operations in the Aleutian Islands in 1943. During the assault, the unit managed to coordinate and control 10 close air support missions, in spite of inclement weather. From this tiny group, today's Tactical Air Control Squadrons (TACRONs) evolved.

Their purpose then, as it is now, is to coordinate and control the air support to be rendered by all air units of all



JO1 Jim Richeson

AC1(AW) Terrance F. Butler plays the role of tactical air director during a mock H-table exercise.

services within the immediate area of an amphibious landing.

TACRONs were normally embarked on board the amphibious commander's flagship which, at the time, was the old battleship USS *Pennsylvania* (BB-38). It wasn't until 1944, during the invasion of the Marshall Islands, that the first amphibious force flagship (AGC) was used in the Pacific.

Deep within the flagship's tactical air control center, TACRON officers receive reports on enemy positions from ground-based and airborne intelligence units. From this information, they plot targets geographically with pinpoint accuracy. They monitor and direct aircraft through voice radio. Pilots report as they approach the target area and receive a detailed description of the objective, the surrounding terrain and the proximity of friendly and enemy troops.

Although this task may seem simple enough to carry out, there were numerous problems which made it difficult for the control units to accomplish their missions.

It wasn't until 1946, long after all amphibious operations in the Pacific ceased, that the first TACRONs were officially established. Lacking the necessary personnel, they drew their manpower for each assault from the amphibious staffs. Communication and coordination also became the control units' biggest challenges during WW II.

The latter stemmed from the reluctance of aviators of all services to place their aircraft under the direct command or control of other arms of their own branches, or of nonaviation commands. Also, with their eyes glued to their military careers, the aviators shivered at the thought of being assigned to a command in which they would not be able to fly.

This problem confronted Naval Aviator Captain Richard P. Whitehead, who was assigned by Admiral Richmond K. Turner, then Commander Amphibious Forces, Pacific Fleet, to the post of Commander, Air Support Control Units for the Iwo Jima and Okinawa campaigns.

"My basic problem as Commander, Air Support Control Units was with the big carrier pilots," Whitehead said. "In the mind of most of them, providing close air support was always a diversionary effort. Just like the Army Air Force, they had their eyes focused on the wild blue yonder. Anything as mundane as circling in the target area on call for half an hour or more was pretty irksome.

"The pilots from the jeep carriers soon got in the groove and provided A-1 results, but I was constantly having to give a sales talk to the big carrier people," he continued. "I had to explain the amphibious problem to them, and also I had to explain them to the amphibious commander."

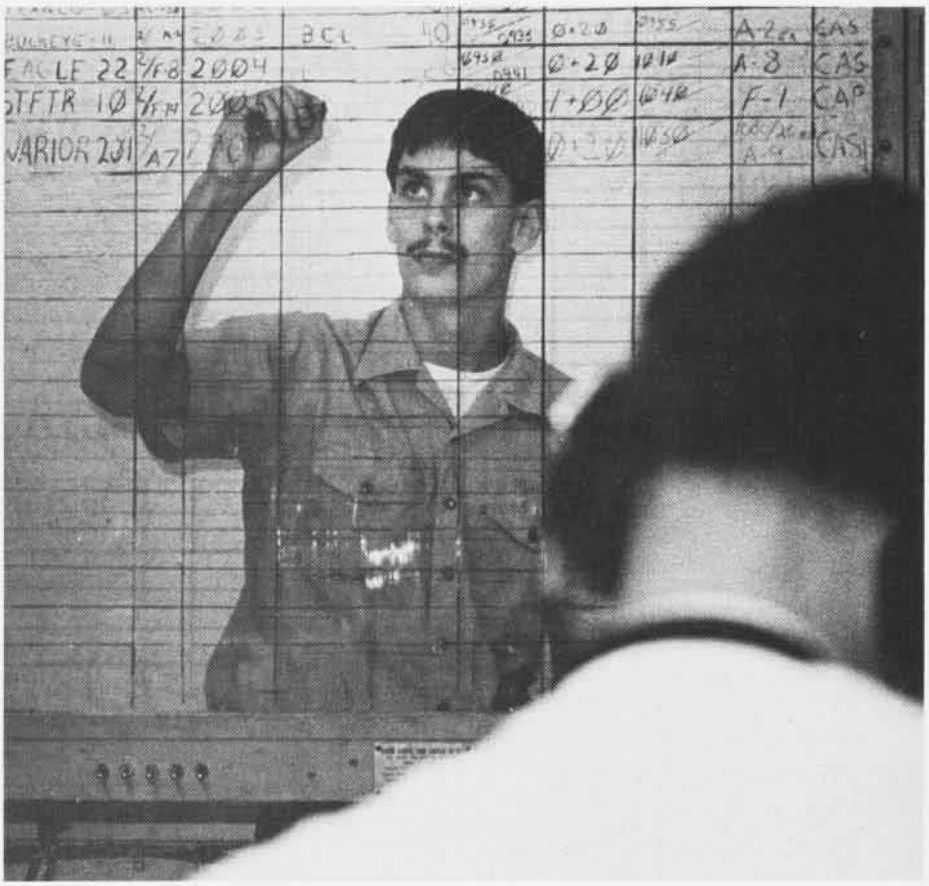
It was Adm. Turner who said that close air support was one of the essential ingredients for his successful island-hopping campaigns in the South Pacific. The amphibious commander thought that Capt. Whitehead had done a lot to develop air support and control for amphibious landings. Turner said, "When Whitehead arrived, air support for an amphibious operation was a difficult theory. When he left, it was a difficult but accomplished fact."

By the end of the war in the Pacific, the air support organization had grown to 24 units, comprising 2,329 officers and enlisted personnel. Four years after the first tactical air control squadrons were established, their services were again needed. This time they were deployed on board the amphibious flagship USS *Mount McKinley* (AGC-7).

In July 1950, TACRON One was calling in and coordinating air strikes in such locations as Pohang, Inchon, Wonsan, Hamhung and Hungnam at the beginning of the Korean conflict. TACRONs were also called upon during the Vietnam conflict and, more recently, during the Grenada invasion. Close air support has become a new and deadly form of delivering a crucial blow to the enemy.

Today, there are two active duty

Air traffic controllers maintain a status board and guide each aircraft in the objective area by voice radio.



JO1 Jim Richeson

While protecting ground troops in an amphibious assault, timing becomes a crucial element during close air support missions. A-4 lays smoke screen.

TACRONs on both the East and West coasts and they are augmented by several reserve tactical air control squadrons.

Administratively, TACRONs are under the control of tactical air control groups. Tactical Air Control Group One, with TACRONS 11 and 12, provide support to the Pacific Fleet Amphibious Force. Tactical Air Control Group Two, headed by Captain Allan D. Parnell, with TACRONs 21 and 22, home-ported at the Naval Amphibious Base, Little Creek, Va., support the Atlantic Fleet Amphibious Force.

According to Commander Roger Burbrink, TACRON 21's commanding officer, the squadron not only controls and coordinates all aircraft within the amphibious objective area, but also trains with various air elements of the Navy, Marine Corps, Air Force, Army and several NATO forces.

TACRONs regularly deploy detachments on board amphibious command ships, with the Second, Sixth and Seventh Fleets' flagships, and maintain a continuous presence with the deployed Amphibious Ready Group, the smallest Marine air-ground task force.

In addition, the squadrons plan all air operations for both U.S. joint service and NATO operations each year. These exercises include *Solid Shield, Bright Star, Ocean Venture, Northern Wedding, Team Spirit* and countless others.

Planning of these operations occurs as early as one year in advance of the proposed exercise date, according to Air Traffic Controller (AC) First Class Terrance F. Butler. It may involve air-space management, close air support, sea-air rescue, targeting, communications, and coordination with all the air, ground and sea elements participating in the exercise.

Capt. Parnell said that, with the greater infusion of recent joint service and NATO operations, there is an even greater need to understand each services' capabilities. "The amount of coordination and planning ensures success with interoperability, not to mention a better show of force once you get there," he added.

Today's squadrons, which each include two Marine and one Army liaison officer, are staffed with mostly Naval Aviators and Naval Flight Officers with flight experience in attack, fighter, airbone early warning, antisubmarine and helicopter aircraft. There are over 30 highly trained air traffic controllers assigned to each TACRON. Everyone in the squadron has been specially indoctrinated in the basics of amphibious warfare and operations by attending a one-week course at the Atlantic Fleet's Landing Force Training Command, NAB Little Creek, Va.

Cdr. Burbrink emphasized that everyone is initially introduced to amphibious warfare when they first arrive at the squadron so that they may learn the language. "This is the only spot on the East Coast where an AC is going to be able to work with the surface force," said Master Chief Air Controller Wade S. Massood, TACRON 21's command master chief.

He added, "It's very hard for me to explain to another AC what it is that we do here." The biggest difference, he said, is tactical air control as opposed to terminal air control. The latter is used by air traffic controllers assigned to air terminals and aircraft carriers during launch and recovery operations.

While in a combat environment, TACRONs rely more heavily on procedural control when guiding various aircraft in and out of the objective area. Timing becomes a crucial element of this technique. Taking into account the exact times each aircraft, separated by altitude, departs for its assigned destination, the air traffic controllers are kept informed of each aircraft's position through voice radio communications.

"We teach amphibious air controllers to be a little bit more flexible and a little more adaptive," said Cdr. Burbrink. "We want them to react quickly to constantly changing situations."

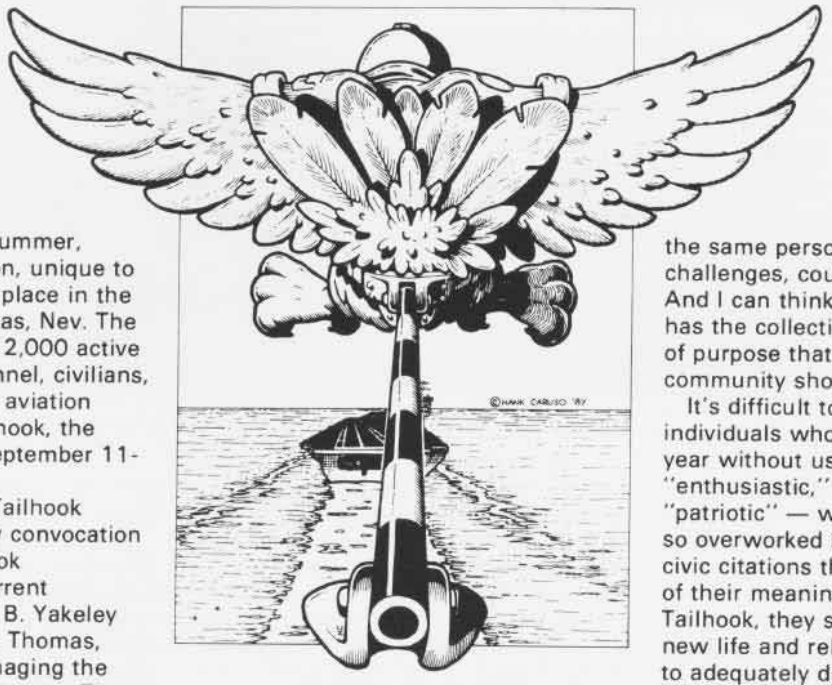
Since the days of the first air control unit on board USS *Pennsylvania*, changes in aircraft capabilities have brought new meaning to close air support. The introduction of the Amphibious Flagship Data System (AFDS), an outgrowth of the Naval Tactical Data System, has taken TACRONs a quantum leap ahead of the days of using manual air control techniques to control fighter and attack aircraft during amphibious operations.

With AFDS, tactical air control squadrons can now provide computerized positive radar control of all aircraft in the amphibious objective area and keep abreast of the entire amphibious landing force air picture.

Since their humble beginnings, TACRONs have served as a vital link between the Navy's surface, amphibious and aviation communities.

■

The Spirit of 'Hook



Copyrighted by Hank Caruso

By Hank Caruso

Every year in the late summer, a very special evolution, unique to U.S. Naval Aviation, takes place in the unlikely setting of Las Vegas, Nev. The players include more than 2,000 active duty Naval Aviation personnel, civilians, and representatives of the aviation industry. The event is Tailhook, the 31st of which was held September 11-13.

Formally known as the Tailhook Symposium, this three-day convocation is sponsored by the Tailhook Association, headed by current president Commander Jay B. Yakeley and executive director Ron Thomas, who has had a role in managing the association for the past 20 years. The Tailhook Association was founded as a nonprofit organization to "foster, encourage, study and develop support for the aircraft carrier, carrier aircraft and their aircrews of the United States of America, in their appropriate role in the nation's defense system."

This year's program included a full slate of unclassified technical briefings, featuring a summary of Naval Aviation operations in the Middle East, an update on Soviet intelligence operations, a look ahead to the cockpit of the future, a review of operations at Top Gun and aggressor squadrons, and outlines of activities at a variety of support and test squadrons. The briefings concluded with junior and senior officers' panels that investigated issues of concern to the operational Naval Aviation community. In addition, Senator John S. McCain III (R-Ariz.) held a question and answer session on military preparedness.

Besides the technical briefings, awards are presented each year to outstanding tailhook squadrons and individual Naval Aviators, recognizing their contributions, dedication and professionalism. Recognition this year included the most traps and the most night traps in each grade, the best squadrons in their separate specialties, and the association's top award — Tailhooker of the Year — presented to Captain Byron L. Duff, USN. All of this was accompanied by a first-class equipment exposition that featured a comprehensive cross section of current and future Naval Aviation systems and developments.

As important as they are, the presentations, awards and exhibits provide only a skeletal background for something much more exciting. The real spirit of Tailhook is not to be found on vu-graphs, brochures or engraved plaques. Rather, it's the special mixture of Naval Aviators and aviation supporters catalyzed by the continuity of 76 years of evolutionary growth that creates the unique chemistry that is Tailhook.

Although it would be difficult to prove academically, there is probably no other government or civilian organization that could produce an atmosphere comparable to Tailhook. I can think of nowhere else where top management would willingly and honestly rub elbows with the newest members of the organization, not for just the brief life of a dinner party, but for three full days. I can think of nowhere else where so many professionals, who have faced and consistently overcome the same personal and occupational challenges, could assemble together. And I can think of no other group that has the collective energy and direction of purpose that the Naval Aviation community shows at Tailhook.

It's difficult to talk about the individuals who meet at Tailhook each year without using words like "enthusiastic," "dedicated" or "patriotic" — words which have been so overworked by press releases and civic citations that they have lost most of their meaning and power. But, at Tailhook, they seem to be infused with new life and relevance. It is impossible to adequately describe or forget the patently intense silence that reverently cradles the national anthem at the awards dinner. It is impossible to describe or explain the unbridled fervor that greeted renowned Naval Aviation supporter Bob Hope on an unannounced visit two years ago, in spite of the fact that most of the people in the room had never actually seen him perform on tour in any theater of conflict. And it is both exciting and painfully sobering to hear young men and women speak of partying and dying in the line of duty in the same breath.

Perhaps the most fitting description was given by Lieutenant Commander Kim Callahan, on the Tailhook committee, who spoke of Tailhook as "family." I became aware of the accuracy of his description three years ago while signing an illustration for Lieutenant Joe Fagone, who requested that it be addressed to his newly born son. "Make sure," he asked, "that you add 'only three days old.'" I met Lt. Fagone last year and again at this Tailhook, where I signed an illustration to his son "on the occasion of his third Tailhook."

Yes, "family" is definitely the way to describe the feeling that binds and sustains the entire Naval Aviation community. It is a feeling that is strong and deep. It takes no vacation and shares no compromise. It is the essence and spirit of 'Hook. ■

DoD-FAA Partnership . . .

Working the Solution

JO2 Julius L. Evans

Cdr. Jim Calhoun is a limited duty officer with 31 years of Navy air traffic control experience.

DoD-FAA: "We're working together. The DoD is not the problem. We're part of the solution."

By Sandy Russell

The skies are bursting with air traffic. In order to reach their destinations, commercial airliners compete with private and military aircraft for chunks of the "wild blue." According to an article in *Navy Times*, domestic airline passenger boardings, at 273 million in 1982, will exceed 574 million by 2000. Commercial aircraft are expected to increase to 4,400 by the turn of the century, a 52-percent jump from 1985's 2,900. General aviation will put 269,000 planes into the sky by 2000, and fly 16 million more flight hours than today's 35.5 million. The Department of Defense (DoD) needs more airspace over CONUS for training. The Navy alone launched its pilots for almost 538,000 hours worth of training flights by the end of FY 87, an 11-percent increase over the previous year's 484,500.

These statistics bring to mind many questions, such as, "Where do we go from here?"

Commander Jim Calhoun is the naval officer who is responsible for ensuring that naval interests are addressed by the Federal Aviation Administration (FAA) as it works toward a solution to this problem. Cdr Calhoun is a Mustang air traffic controller with 31 years of naval service. He is deputy chief of the National Airspace System (NAS) Plan Program Office, located in FAA Headquarters, Washington, D.C. *Naval Aviation News* asked him to comment on his background and on airspace and air traffic control (ATC).

Why did you choose the Navy and the air traffic controller (AC) rating?

I joined the Navy because of the movie *Mister Roberts*, but I had no idea that the Navy had airplanes. I originally planned to become a boatswain's mate. When I got out of boot camp, I was slated for aviation boatswain's mate school but it was full. One day, I saw a sign that read, "Be an ACW and fly," and the $55-per-month flight pay was appealing. I met the qualifications and was sent to air control early warning "A" school. My rating later changed to AC.

I can assure you that being an AC is the most demanding, gratifying occupation to which I could have aspired. I've often been asked what civilian job is similar to the ATC profession. My answer: a short-order cook. You have to have a good memory, work under pressure and do a lot of things simultaneously. Like the cook in a waffle house, you're under the scrutiny of the customers. Everything a controller says is recorded, so there's no chance to slide the burned waffles off to the side and throw a new batch on the grill.

I have no regrets. This is my life, and I'll stick around until they quit promoting me.

Why were you chosen for your present job?

I was assigned to the Airspace, Airfields and Air Traffic Control Branch (OP-554) under the Deputy Chief of

Naval Operations (Air Warfare). As a collateral duty to my job as a program manager, I worked on the NAS Plan modernization initiatives. It became obvious that the complexity of the project required more than part-time support. Because of my experience in air traffic control, it was decided that I would relieve the retiring incumbent.

What are your responsibilities?

I represent the Department of the Navy on all issues associated with the NAS to ensure that any change to the plan will allow the Navy to maintain interoperability with the FAA after the NAS modernization. I am the contract officer for DoD to the Martin-Marietta Corporation, whose contract is designed to ensure that the integration of the DoD into the FAA's NAS Plan is accomplished. I am also the contract officer for Project *Blue Air*, which is a Navy intiative to study the "special use" (military) airspace requirements of Naval Aviation for the next 15 years.

Are there other Navy liaisons to the FAA?

We have Navy representatives assigned to four of the FAA's nine regional offices — in the areas that have the most Navy/Marine Corps flight activity. In the western Pacific, there's a Navy commander, an E-8 and a Marine lieutenant colonel; in the Southwest, a Navy commander and E-8; in the Northeast, a Navy commander and master chief; and the Southern region has a Navy commander, master chief and Marine lieutenant colonel. If a problem can't be solved at the regional level, it's kicked up the chain of command. When it gets to Washington, I work the problem with my FAA contemporaries.

What is the National Airspace System Plan and when will it be implemented?

The NAS Plan is an effort by the FAA to modernize the antiquated systems that it has in the field to meet today's explosion of aviation demands. The $15.9-billion program is designed to provide air traffic control service in a timely and safe manner. It was written in 1981 as a 10-year modernization plan and is scheduled for completion in the 1990s.

Is the increase in near-midairs the result of an air traffic control problem or an airspace problem?

The bottom line is that the system is safe. Of course, the more saturated the airspace, the more potential there is for two aircraft to come closer to each other than preferred. I use the term "command attention" to describe not only the Navy/Marine Corps but the general public as well. If a command stresses near-midair potential in its daily briefs, and two aircraft come close together, the individuals involved remember the briefing and submit a near-midair report. Then the public reads the statistics in the newspapers and it's like a domino effect. When something starts, others follow the trend. Obviously, we have more aircraft in the system than ever, and a more aware public through news media, so it feeds on itself.

Are there more vulnerable places in the system than others?

Sure. As you know, you can't go to heaven without going to Atlanta first. Outlying airports pick up people in rural areas and deliver them to metropolitan areas, where more airplanes take more airspace and the potential for a problem is greater. That's the case whether it's in Pensacola, Fla. — where the Navy has a lot of flight activity in the training command — or in Chicago, New York, Los Angeles or Atlanta airspace.

What can Navy aircrews do to avoid near-midairs besides normal safety procedures?

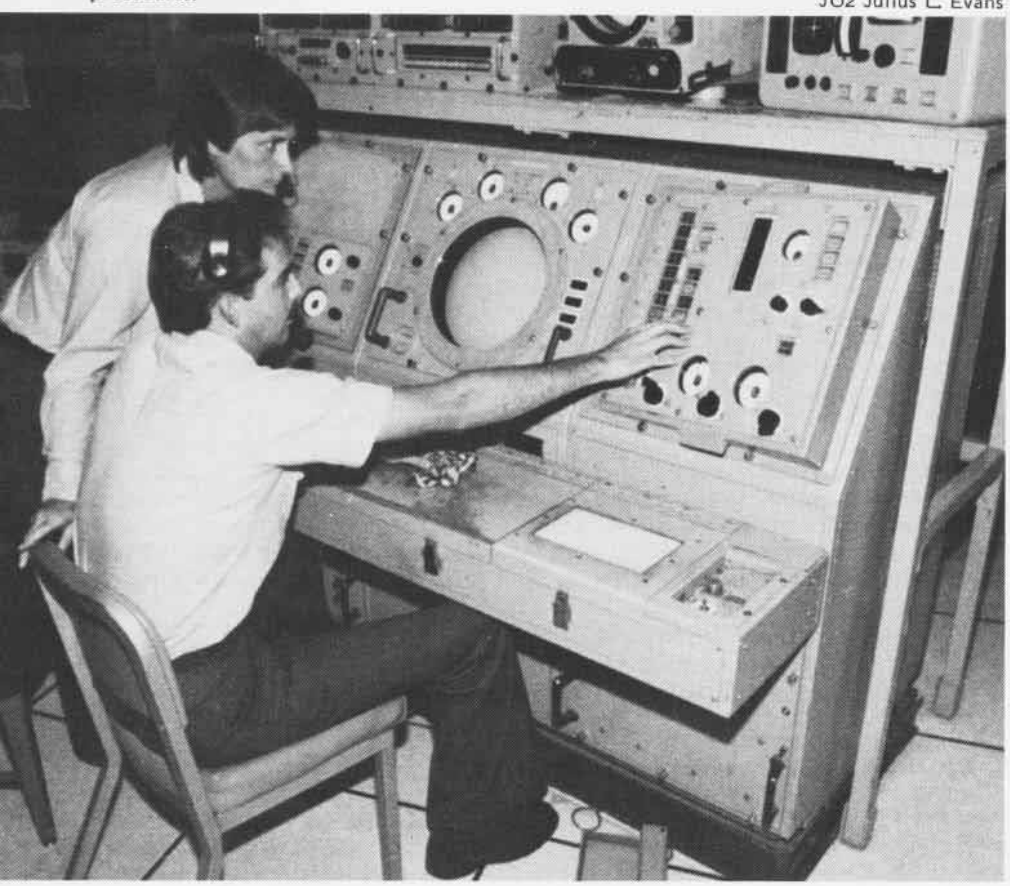
Do what they were trained to do. "See and be seen" in visual conditions is still the rule. It's like defensive driving. Put yourself as far in front of the cockpit as you possibly can.

Are there any near-term FAA procedural changes that will affect airspace?

The purpose of the NAS Plan, other than to replace antiquated equipment, is to increase the dependence on automation, which will increase controller productivity — the same amount of people can work more airplanes safely. A new advanced computer system will provide vastly improved processing capabilities at 20

"It's a significant challenge to grow an AC." ACC(AW) Debra Pewitt, left, the Navy's only female CATTC instructor at the AC school, NATTC Millington, Tenn., trains a student in final control procedures.

JO2 Julius L. Evans



major air traffic control centers, nationwide. The contract has not been let, but the request for proposal has been processed.

Some recent initiatives include expansion of some of the terminal control areas and implementation of airport radar service areas. The FAA's intent is to enhance flight safety in the international airspace system. We are constantly revisiting the airspace structure to see if modifications can ease flows or improve safety and cost-effectiveness.

Would increasing the size of aircraft help — say in commercial airliners — by moving more people?

Obviously, aircraft are much larger today than they were in the fifties. But if you have 10 747s that arrive at the same airport at the same time, you might have moved more people, but the ground congestion (getting in and out of the terminal) becomes a limiting factor. Most terminals were built for 707-type traffic. Now we have 747s and DC-10s, so fixing one problem may compound another.

Are there plans to expand any major airports?

They're being looked at all the time. Right now, the Dallas-Fort Worth airport plans to add additional runways. You read a lot about the capacity of the system but, in my view, the limiting factor is runway capacity.

There are certain separation standards which must be maintained between aircraft in trail. If the minimum separation between aircraft on the same runway is three miles, and the approach is 120 mph, that's two miles a minute. This means there's a minute and a half between airplanes, so one runway's capacity in ideal conditions is 40 per hour. How do you improve that capacity? Build more runways, but decreasing weather or malfunctioning equipment make it a sliding scale. Two runways do not ensure the capacity for 80 aircraft per hour. Many factors affect the ratio, such as airspace structure (mountains, special use airspace, other airports in close proximity, etc.).

How is the responsibility for the control of certain airspace determined?

The FAA Act of 1958 tasked the FAA with the responsibility of providing air traffic control service in CONUS and managing the airspace. When it is in the best interest of the DoD to assume control of airspace in selected areas, the FAA has the authority to delegate that responsibility to the military. In the Pensacola area, the approach control is provided by FAA controllers at the Pensacola civilian airport. At NAS Pensacola and NAS Whiting Field, there are ground control approach radars and active duty Navy control tower operators. However, the Navy runs the approach control at Naval Air Stations, Lemoore, Calif.; Whidbey Island, Wash.; Oceana, Va.; Key West, Fla.; Patuxent River, Md.; Brunswick, Maine; and Kingsville and Chase Field, Texas; among others. The Marine Corps has the approach control responsibility at Marine Corps Air Stations, Yuma, Ariz.; Beaufort, S.C.; and Cherry Point, N.C.

During the 1981 FAA air traffic controller strike, Navy ACs filled some of the vacant slots. How were the Navy air control facilities manned?

The Navy representative involved in drafting the FAA Act of 1958 was a shrewd individual. He insisted that Navy controllers have the same training and certifications of their FAA contemporaries so that there would never be a question of the Navy credentials if an augmentation such as the one in 1981 was required.

I was the ATC officer at NAS Whidbey Island being transferred to Lemoore during the strike. We had contingency plans if the FAA asked for assistance. I identified five people from Whidbey and eight from Lemoore to augment the FAA workforce. By changing the watch bill — giving the active duty people more hours to work — we could afford to support the national problem.

We knew that the ACs we sent to the FAA were good, but they exceeded everyone's expectations. Together, the Navy and Marine Corps sent about 150 controllers, and there are FAA files documenting the fantastic job they did. But I feel that those who stayed at home and did their jobs deserve high praise, too.

Do some Navy ACs leave the service to work for the FAA?

The FAA has a maximum hiring age of 31 for air controllers. We lose a certain amount to the FAA when it's hiring, but by the time a sailor acquires enough credentials to be attractive, he's close to 12 years of naval service and 31 years of age. He is usually an E-6 running a watch section, in either radar or tower. Once a person is in charge, it's difficult to revert to the student mode. The individual is also more than halfway toward a 20-year retirement.

Statistics show that there are about 2,600 fewer air traffic controllers overall than in 1981. Can you explain this?

There are fewer controllers than before the strike because the FAA felt that the organization had more than it needed. Now its workforce is at the required level.

Most people don't realize what it takes to make an air traffic controller. In my judgment, it's about a six-year evolution from the neophyte with no knowledge of ATC duties to a positive asset to the watch bill.

In the Navy, we rotate between the ship and shore. When an AC is transferred, he must requalify because the airspace structure is different and the navigational aids vary. He must go through an on-the-job training program, given at the facility and dominated by site-specific information, to be certified at that location. When you consider the attrition and other factors, it's a significant challenge to grow an AC.

The FAA is in the news daily. Some people might be wary of air travel due to the near-midairs and actual flight mishaps. Can you reassure us that the FAA and the Navy are doing what is necessary to ensure our safety?

The modernization of the ATC system may be the largest civilian initiative in history. There's no doubt that we have the most experienced personnel in the Navy that we've ever had. All but one of the Navy ATC officers are ex-white hats. We have senior ACs on the staffs of type commands who hold inspections to ensure that what should be done is being done. Every postition in the ATC chain of command is represented by a professional.

The FAA is training people as fast as it can without reducing standards. Safety is always paramount. I fly a lot and I'm never concerned about safety in the air. I know a lot about it. That's all I've done my entire career. If anyone can handle the unprecendented demand for air traffic service, the FAA is the organization that can. The DoD runs the second largest ATC system in the world, next to the FAA. It is a common system — a partnership. We're working together. The DoD is not the problem. We're part of the solution.

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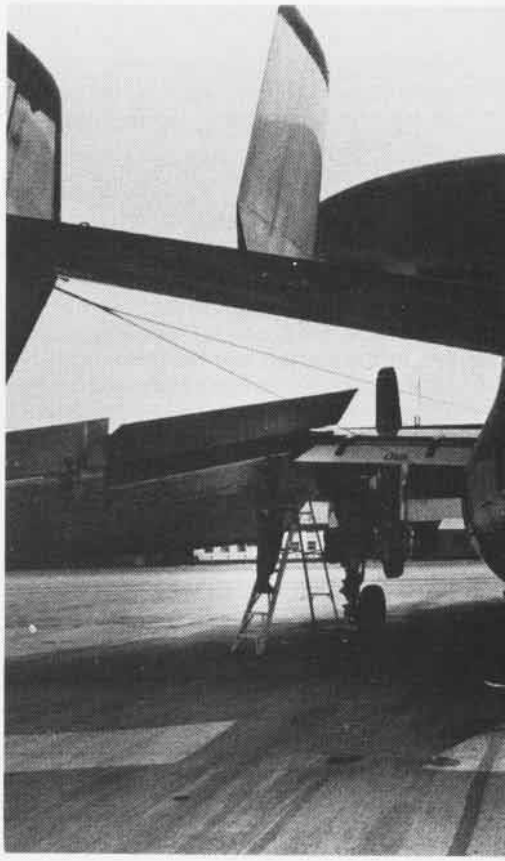
Sharpening the Eyes of the Fleet



Story and Photos by JO1 Jim Richeson

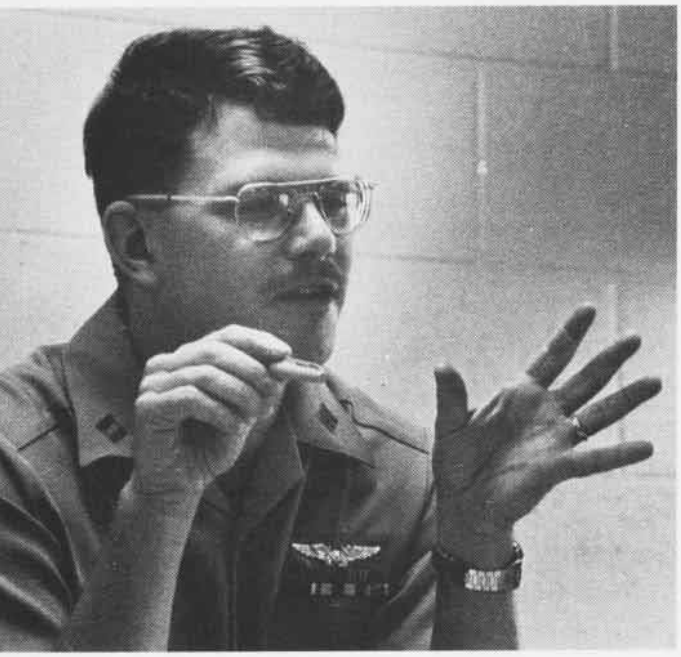
Since Japan's devasting blow to the U.S. Pacific Fleet on December 7, 1941, several Navy aircraft have proudly served as the eyes of the fleet. But the days of the TBM-3W *Avenger*, AF-2W *Guardian*, AD-5W *Skyraider*, also called the "Guppy," and the E-1B *Tracer*, affectionately known as the "Willie Fudd," are long gone.

Today's E-2C *Hawkeye*, built by Grumman, is by far the most advanced and sophisticated airborne tactical data system designed for carrier operations. One E-2C can track all surface and air traffic at 100 or more airports between Boston, Mass., and Washington, D.C.

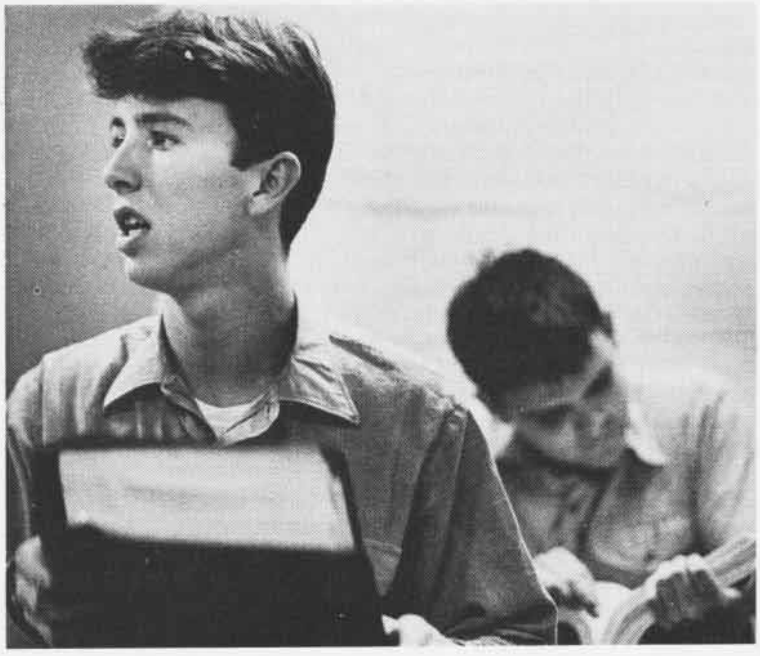
Its predecesors, the E-2A and B, advanced the state of the art with on-board sensors which gathered facts to store in their computers. The E-2C can detect and track enemy aircraft, ships and missiles over land and water in any weather conditions.

Each aircraft carries a five-man crew. This includes the pilot and copilot, a combat information center officer, an air control officer and a flight technician. The aircrews, from the pilot to the technician, were initially trained by one of the two Carrier Airborne Early Warning Training (RVAW) Squadrons — on each coast.

Since the Navy received 59 brand-new E-2A *Hawkeyes* over 20 years ago, the *Greyhawks* of VAW-120, NAS Norfolk, Va., and the *Firebirds* of VAW-110, NAS Miramar, Calif., have been training Naval Aviators, Naval Flight Officers (NFOs), flight technicians and maintenance personnel. Both squadrons were officially designated as Carrier Airborne Early Warning (VAW) Squadrons in May 1983. Although they are recognized as training squadrons, during time of war, they may be



With the help of experienced Naval Flight Officers like Lt. Billy G. Combs, student NFOs absorb all of the E-2C's electronic capabilities.



VAW-120 trains over 350 enlisted flight technicians and maintenance personnel from the fleet each year. Each student receives training in all areas of E-2C maintenance.

The E-2C Hawkeye proudly serves the Navy today as the eyes of the fleet.

mobilized like any other fleet VAW unit.

According to Lieutenant Tom Magno, VAW-120's student control and schedules officer, the students come from the fleet and various training squadrons after completing basic flight training. For the students to assimilate all of the *Hawkeye's* sophisticated and complex electronic equipment, they are subjected to long and rigorous training periods.

The Naval Aviators go through a 30-week syllabus, while the NFOs tackle 37 weeks of Airbone Tactical Data System (ATDS) training. This highly integrated system, when coupled with a skilled crew, becomes a complete airborne combat information center capable of controlling an entire carrier-launched strike.

Lt. Magno said that by the end of their training, student pilots have carrier-qualified and NATOPS-qualified in the E-2C. "They have to be 90-percent complete in each syllabus before we let them carrier-qualify," Magno said. But each student pilot must be 100-percent complete in each syllabus before becoming NATOPS-qualified.

He added, "Here, we teach student pilots how to safely fly the aircraft. They will learn how to tactically use the E-2C when they go to their assigned fleet squadrons." The student NFOs, on the other hand, become air control-qualified by earning their wings halfway through the ATDS syllabus.

With the help of the squadron's full-motion cockpit simulator, student pilots experience and learn the full operational limits of the aircraft. Some even "crash and burn," but they walk away without a scratch, and without losing a multimillion-dollar asset.

The squadron also has a realistic weapons systems trainer, which contains some of the actual aircraft avionics equipment. Student NFOs are introduced to airborne tactics with the help of this $13.8-million device.

Lieutenant Commander Tim Leighton, the squadron's fleet readiness aviation maintenance personnel officer, estimated that the squadron trains over 350 enlisted personnel per year in all areas of E-2C maintenance from avionics to maintaining the *Hawkeye's* large overhead rotating radome. The radome houses two separate antenna systems — one for search and the other for identification, friend or foe.

To handle the influx of students each year, the squadron is currently staffed with 46 officers and 272 enlisted members. VAW-120 trains with seven E-2Cs and two C-2A *Greyhounds*.

The reprocured C-2s were added to VAW-120's inventory in June 1985. Also built by Grumman, the *Greyhound*, which is used by the Navy for carrier on board delivery, has the same power plant and cockpit avionics package as the E-2C. The new aircraft gave the squadron added responsibility in creating a new training program for pilots and aircrews of fleet logistics support and aircraft ferry squadrons.

LCdr. Leighton said that in FY 88, the squadron will begin training U.S. Coast Guard personnel. With its detection capabilities, the E-2C has proved to be a valuable asset for the U.S. Customs Department and Drug Enforcement Agency by helping the Coast Guard track down illegal drug traffickers and smugglers.

To complement the E-2C's diverse capabilities, VAWs 120 and 110 have expanded their training programs to include more Navy replacement pilots, NFOs and maintenance personnel for the Navy and other aviation communities.

The E-2C, with its highly trained five-man crew, has repeatedly demonstrated the ability to control intercepts and strikes, conduct air traffic control and assist in rescue operations. It also has impressed other government agencies with its drug-interdiction capabilities. In any role, the *Hawkeye* excels as the eyes of the fleet.■

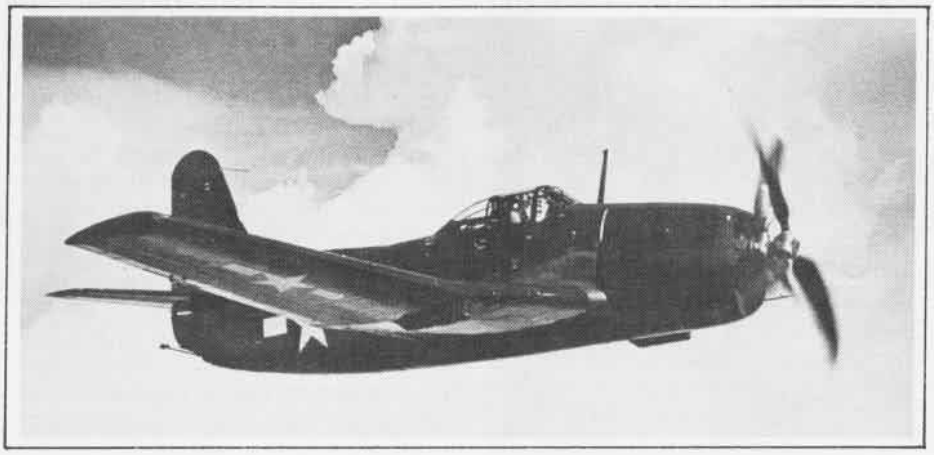
With the addition of two C-2A Greyhounds to its inventory, VAW-120 also trains pilots and aircrews of fleet logistics support and aircraft ferry squadrons.

There are many Naval Aviators still in uniform today who have fond memories of flying the Navy's first successful (as well as the last!) piston-engine, single-place dive-bomber — the Douglas AD, known in its later years as the "Spad." Of course, many others flew it during the long service career which followed its original appearance as the XBT2D-1 in 1945.

There are only a handful of former Naval Aviators who remember flying Martin's big, heavy AM-1 *Mauler*, produced in limited numbers after its 1944 XBTM-1 prototype. While the XBT2D/AD suffered some early problems with its Wright R-3350 engine, the R-3350 was clearly a better choice than the XBTM/AM's larger four-row, 28-cylinder radial Pratt & Whitney R-4360 for the single-place, carrier dive-bomber/torpedo plane which became the standard carrier attack aircraft until replaced by jet types many years later.

Far fewer flyers remember the original Navy aircraft design for this type of airplane, the Curtiss XBTC of 1942. It took the whole WW II period for this new type to materialize. That fact must have been a disappointment to those in the Bureau of Aeronautics (BuAer) who decided in January 1942 that an R-3350-powered, single-place airplane — equipped with four 20mm cannon and capable of dive-bombing and torpedo attacks — would be the best replacement for the two-place VSB types still scheduled for production at that date. Curtiss-Wright, the company requested to design the first airplane of this type, must have looked back with even more disappointment when events of the war years left them completely out of producing these aircraft after their head start.

XBTC-2 Model B



After the decision was made to initiate experimental design of an R-3350-powered VTB airplane, Curtiss-Wright's Columbus Division got the job of proposing the design — in keeping with wartime procedures intended to avoid duplication of engineering effort. Their June 1942 proposal covered the requested R-3350 airplane and an alternate version using the promising new R-4360.

Under BuAer guidance, the R-3350-powered model was as simple a design as possible with no new technology incorporated, so that its development would be as rapid as possible. An extended wing span (two feet) and more effective high-lift system would help ensure carrier suitability of the otherwise similar, but heavier R-4350-powered version, using contra-rotating propellers to utilize the additional power without requiring a longer landing gear. An internal bomb bay would carry one bomb, with provisions for carrying additional bombs or a torpedo externally.

Details of the design were worked out between BuAer and Curtiss and four experimental prototypes — two R-3350-powered XBTC-1s and two R-4360-powered XBTC-2s — were ordered by letter of intent in late June 1942, with high priority assigned. Events soon transpired to change the picture, most of them involving problems with Curtiss-Wright products.

The need to get SB2C-1s into production and then to correct their early service problems strained the Columbus engineering organization. The problems of the unsatisfactory S03C observation seaplane, as well as combat requirements for this type of airplane, lead to the assignment of a higher priority program to Columbus for the single-place XSC-1 armed seaplane scout. These events, plus difficulties with Wright's development of the R-3350 engine, all led to a decision to drop the XBTC-1 and concentrate only on the XBTC-2 with a low priority, since the R-4360 would not be available in its contra-prop version at an early date.

Wind tunnel tests revealed problems with the full-span Duplex flaps planned for use on the XBTC-2, so standard-type wing outer panels (designed for the XBTC-1) were built for the first XBTC-2, while the full-span flap panels would initially fly on the second. To distinguish them, the airplane with standard-type panels, having a straight leading edge and tapered trailing edge,

XBTC-2

Warren M. Bodie

XBTC-2

By Hal Andrews

XBTC-2 Model B

was referred to as "Model A" while the full-span Duplex flap wing with straight trailing edge and swept-back leading edge was "Model B."

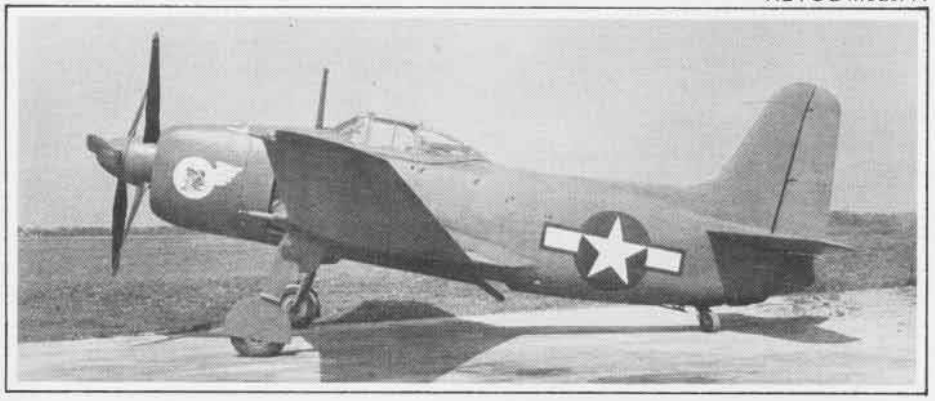
The first XBTC-2, as Model A, finally flew in January 1945. By this time, the XBTM-1 had already flown at Martin's Middle River, Md., plant, and the XBT2D-1 design and construction was well along toward its first flight in March 1945. It was already clear that, barring extremely serious problems with both, the BTC would be only an experimental design. Its one-time significant new features, such as the framed, raised, all-around-vision cockpit canopy, were already replaced by new features on the other designs, such as full bubble canopies. Doing away with internal bomb carriage reduced their fuselage size, weight and clean configuration drag. And the contra-prop was still in its infancy.

Flight testing of the XBTC-2 proceeded, though not smoothly, with a flight line cockpit fire and damage due to failure of one landing gear down lock causing delays for repairs. Other development problems were minimal, but stress surveys of the Curtiss electric contra-prop lead to its grounding, and the Aeroproducts' replacement required careful monitoring. By VJ day, troubles with the engine's dual-rotation propeller drive gears grounded the XBTC-2 program for several months.

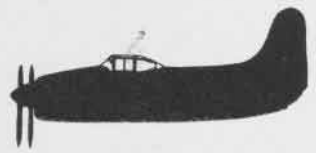
Meanwhile the Duplex flap "Model B" second airplane joined the first in the flight program, and the first had its Duplex flap panels installed. Interest in the early months of 1946 centered on the contra-rotating propellers and the full-span Duplex flaps, both of which were seen to be useful in future designs. However, with an acceptable development status achieved, the two XBTC-2s were delivered to the Naval Air Test Center (NATC), Patuxent River, Md., in July 1946, in the intended Duplex flap configuration.

Serving with NATC's Flight Test and Service Test divisions, their time there was short. The second one crashed in February 1947, while the first was lost in transfer to the Naval Air Material Center, Philadelphia, Pa., in August 1947. ■

XBTC-2 Model A



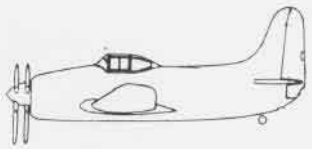
XBTC-2

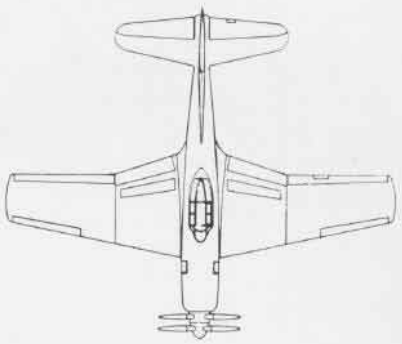


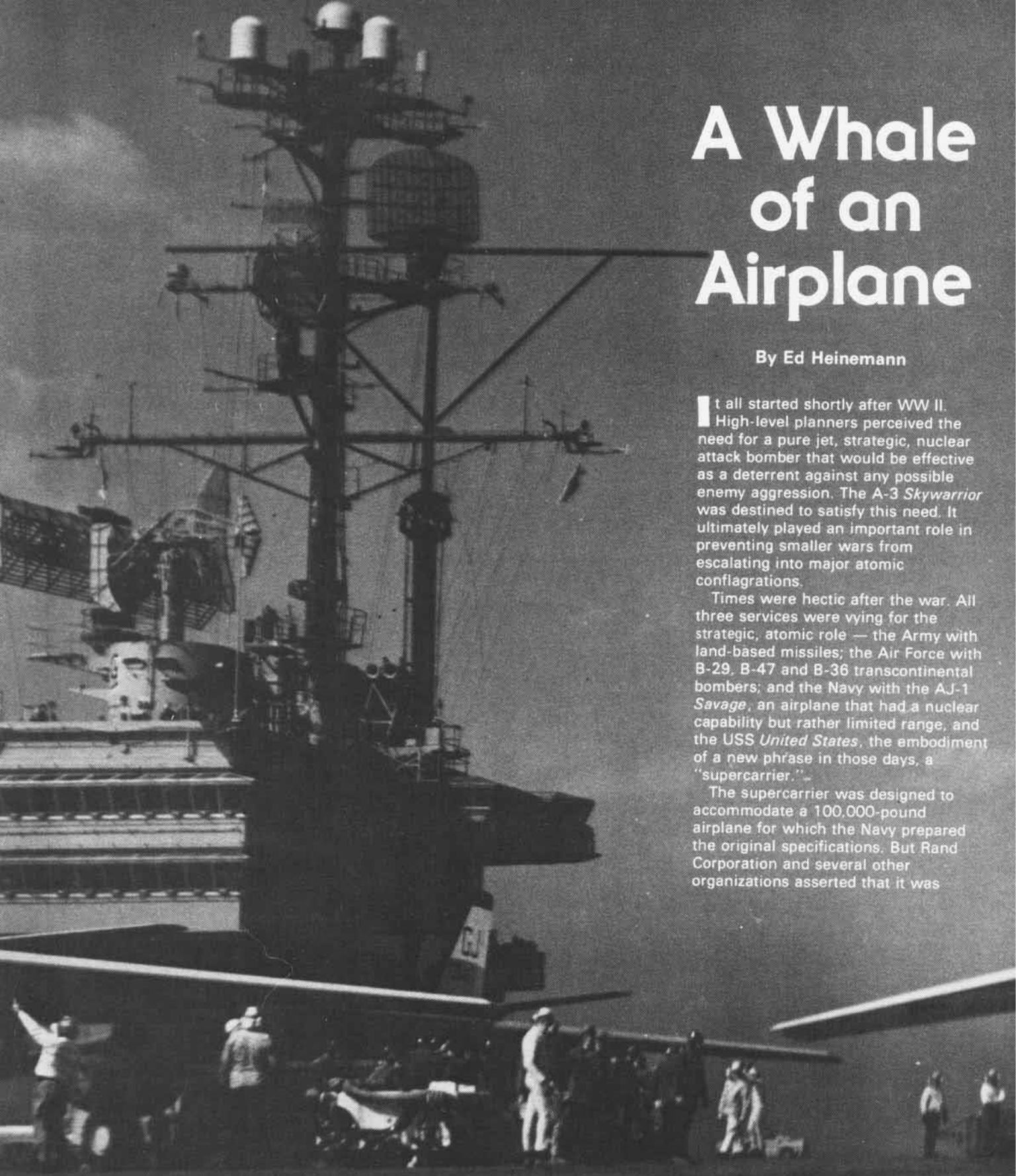
Span	**50'**
Length	**38'7"**
Height	**12'11"**
Engine	
P&W XR-4360-8A	**3,000 hp**
Maximum speed	**370 mph**
Service ceiling	**26,200'**
Range	**800 mi.**

Armament

Four 20mm cannon; one 1,600-lb. (internal) or one Mk 13-2 torpedo (under fuselage); and two 500-lb. bombs.







A Whale of an Airplane

By Ed Heinemann

It all started shortly after WW II. High-level planners perceived the need for a pure jet, strategic, nuclear attack bomber that would be effective as a deterrent against any possible enemy aggression. The A-3 *Skywarrior* was destined to satisfy this need. It ultimately played an important role in preventing smaller wars from escalating into major atomic conflagrations.

Times were hectic after the war. All three services were vying for the strategic, atomic role — the Army with land-based missiles; the Air Force with B-29, B-47 and B-36 transcontinental bombers; and the Navy with the AJ-1 *Savage*, an airplane that had a nuclear capability but rather limited range, and the USS *United States*, the embodiment of a new phrase in those days, a "supercarrier."

The supercarrier was designed to accommodate a 100,000-pound airplane for which the Navy prepared the original specifications. But Rand Corporation and several other organizations asserted that it was

The A-3 Skywarrior flew for the first time in October 1952, 35 years ago. The two-engine giant of the flight deck, built by the Douglas Aircraft Company, began as a heavy attack bomber with nuclear capability. Its sound and durable design enabled it to persevere through the years, performing numerous missions. The aircraft was modified and appeared in a variety of versions ranging from reconnaissance to tanker, from radar trainer to passenger transport. Rarely has an airplane achieved such lasting success. The guiding force of Douglas' El Segundo, Calif., division, which built the A-3, was Ed Heinemann — "Mr. Attack Aviation" and Honorary Naval Aviator No. 18. In this article, he relates some highlights about the vulnerable king of the carrier.

impossible to come up with an aircraft that could provide long-range, nuclear delivery from the flattops, at less than 150,000 pounds!

As the interservice battle proceeded, it became clear to me that the Navy's supercarrier would not survive. The secretaries of the Army and Air Force, as well as General Dwight D. Eisenhower, then a special military advisor to President Truman, were all against it.

The only viable alternative was to build an airplane that could operate from the three *Forrestal*-class carriers (*Forrestal, Saratoga,* and *Ranger*) which have a deck weight limit of 68,000 pounds.

I remember the day I walked into the office of the Navy captain who handled new aircraft proposals, early plans for the *Skywarrior* in hand. "Oh no, not you," he said. He glanced at the proposal. "You know damn good and well you can't build an airplane with that weight. I thought you were an honest engineer."

I offered to pick up my proposal and go home, if the Navy wasn't interested. The captain, John "Mother" Murphy of Murphy's Law, however, was quick to say, "Leave it here and I will have it checked out."

The next day I received a telephone call from Arthur Raymond, my boss at Douglas Aircraft in California. "I just got off the phone with General Vandenberg [USAF]," he said. "Vandenberg asked me, 'Who is this guy Heinemann, the one who is telling the Navy he can build a strategic bomber for 68,000 pounds. And will you please get him to hell out of Washington.'"

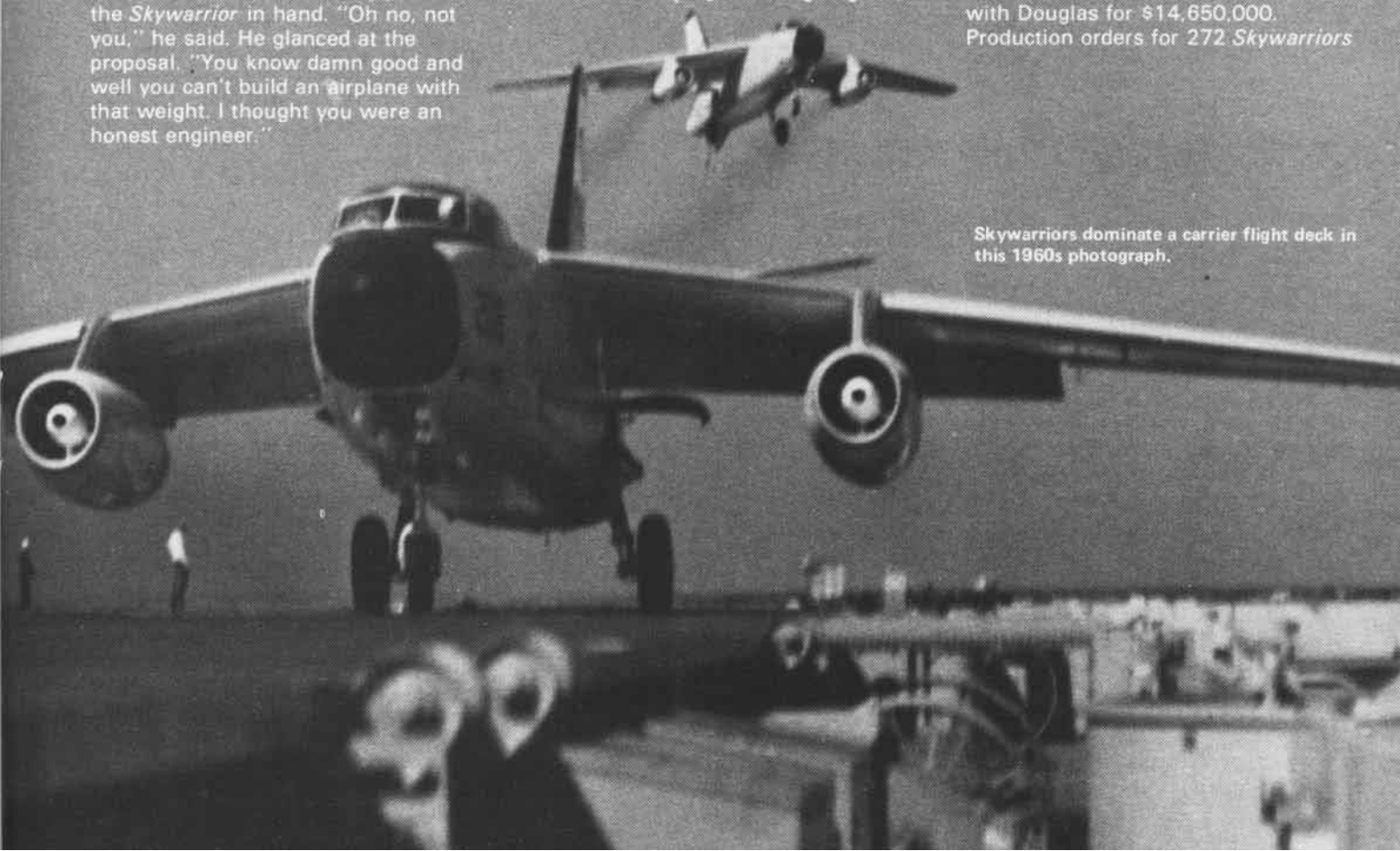
I asked Raymond, "Should I get out?"

"Not necessarily," he replied.

Next day, the captain I had spoken to and one of the high-ranking engineers apologized to me for doubting that Douglas could build such a plane. They had frantically scrutinized the proposal and agreed there was a fighting chance that a 68,000-pound attack bomber could become a reality. My rating with the Navy increased abruptly. My rating with the Air Force immediately dropped to zero.

Essentially, our design demonstrated to the Navy that there was hope for a strategic capability even if the supercarrier was cancelled, which it was.

When the request for proposal was issued by the Bureau of Aeronautics for a 100,000-pound strategic bomber, North American, a competing aircraft manufacturer, did not bid because its officials decided that such a plane could not be built at 100,000 pounds. At the time, North American had the A2J *Savage,* a turboprop plane which the company hoped to sell. North American did not feel it could handle both the *Savage* and the new design at the same time. The Curtiss-Wright Company submitted a bid for a 100,000-pound bomber. Douglas stuck to the 68,000-pound version, as promised. Study contracts were let to both Curtiss and Douglas but, after a few months, Curtiss was dropped. A prototype contract for two flight and one static test "article" was negotiated with Douglas for $14,650,000. Production orders for 272 *Skywarriors*



Skywarriors dominate a carrier flight deck in this 1960s photograph.

followed. These included bomber, tanker, countermeasure, photo, and transport configurations.

Douglas test pilot George Jensen made the first A-3 flight at Edwards AFB, Calif., on October 28, 1952, signaling the beginning of a new phase of carrier aviation — one that gave the Navy its first heavy, strategic, jet-bomber capability. In 1973, I asked an internationally recognized military affairs expert what the Soviets feared most since WW II. His answer: the U.S.'s carrier fleet and its carrier-based airplanes, especially the A-3 *Skywarrior*.

As with the conception and development of any aircraft, there were a number of memorable incidents associated with the *Skywarrior*.

In those days, there was a "mock-up board," tasked with ensuring that the cockpit arrangement properly accommodated the crew in terms of operating the aircraft. In the case of the A-3, the board honestly believed they had created the perfect arrangement. In the interest of standardization, they configured a "fighter-type" cockpit with throttles on the left-hand side so that transition from one airplane to another could be accomplished with minimum training. All members concurred that this was a great idea.

PHCS R. L. Lawson

Sometime later, a very good friend of mine and an esteemed Naval Aviator, Captain Chick Hayward, arrived at the plant to inspect the aircraft and the mock-up arrangement. He was quite pleased with everything he saw, *until* Hayward got into the cockpit. He took one look at the throttles on the left and said, "Who the hell mocked up this airplane?"

There followed some acrimony and excitement resulting in the temporary installation of a telephone, in the cockpit. Hayward, representing the Bureau of Aeronautics, called the chief himself. Hayward explained in no uncertain terms that the throttles had to be in the *center* of the cockpit.

Chick had been influenced by a recent experience while flying an AJ *Savage*, with Secretary of the Navy Floberg in the right-hand seat. The *Savage* had two piston engines on either wing and a jet powerplant in the tail. On takeoff, one of the engines quit. Hayward was busily engaged with the flight controls. Floberg had to manipulate the throttles. Had they been on the left, as we had planned in the A-3, disaster might have resulted because the throttles could not be reached from the right seat.

The incident proved dramatically the importance of operational experience in a new design.

On another occasion, one evening after a formal dinner in a Baltimore hotel, I was approached by a young captain, Thomas Moorer. He said he had an idea he wanted to discuss with me. Moorer was then in the military requirements branch. Along with one of his associates, we retired to my hotel room to talk over his proposition.

In a nutshell, Moorer wanted a refueling capability added to all A-4 *Skyhawks* and A-3 *Skywarriors*. He suggested that this could be accomplished by putting extra fuel tanks in the unused spaces and refueling equipment in the tail of those two aircraft.

I objected strenuously. These "additions" would, in my view, ruin two otherwise sound airplanes. There simply wasn't space for either tanks or hose and drogues in the tail of either aircraft.

About midnight, after a candid and full exchange of ideas, I agreed to meet Capt. Moorer in his office the next day with a proposal. Believe it or not, my idea was sketched out on the back of an envelope. (Nowadays, such a transaction would require virtual

An EA-3B from VQ-1 launches from USS Constellation's waist catapult while in the Indian Ocean, 1974.

A Skywarrior leaves the deck of USS Hancock in 1957. The original A-3 weight was 68,000 pounds. Many experts believed a heavy attack bomber with nuclear capability would have to weigh 100,000 pounds.

volumes of material.) We, the Douglas Company, would convert a small number of *Skywarriors* to tankers by installing both extra fuel and refueling equipment in the bomb bay. We would give all A-4s tanker capability by means of a 300-gallon "buddy" store on the center bomb rack and extra tanks on the outer racks, if desired.

This way, we could provide tankers to the Navy without, as I remember stating it, "lousing up my beautiful airplanes!" Moorer agreed.

Unofficially, A-3 and A-4 tankers, by providing fuel in a hurry, when needed, saved nearly 500 airplanes during the heat of the Vietnam war in the late 1960s alone. The total dollar value of planes saved was estimated to be in the billions.

It was no surprise to me that then-Admiral Tom Moorer went on to become Chief of Naval Operations and, ultimately, Chairman of the Joint Chiefs of Staff.

There was another incident, somewhat amusing, when we tried to get approval to operate the "Whale," as it came to be called, aboard *Essex*-class carriers. The Bureau of Ships, which tended to be a conservative organization, was convinced that the A-3 would break through the deck. My engineers were equally convinced that it would not.

To prove the point, we built a portable drop test rig that contained an A-3 landing gear, properly weighted. We transported this device to the shipyard in Bremerton, Wash., and repeatedly dropped it on all possible landing areas of a carrier deck. Throughout a multitude of tests, we experienced only one minor deck failure, which was easily repaired.

This was a "monkey wrench" approach to settling an issue but it resulted in the certification of the *Skywarrior* for operations from the smaller carriers, which greatly increased its operational base and effectiveness. This was not very sophisticated engineering, but it saved a lot of dollars.

The A-3 was the fastest heavy bomber of its time and set a variety of records. In March 1957, a round-trip record was established on a flight from Los Angeles to New York and return, in nine hours and 35 minutes. In the same month, it achieved another milestone when it flew from Burbank, Calif., to Miami, Fla., in three hours and 39 minutes.

The Whale was the first jet airplane to take off from an aircraft carrier in the Pacific, fly nonstop across the U.S. and land on a carrier in the Atlantic Ocean.

No doubt, the A-3 is in its twilight years. Yet it still plays an important role in Naval Aviation. KA-3 tankers fly in reserve units while early-warning, support training (ERA-3) and surveillance/reconnaissance (EA-3) versions operate around the globe with the fleet. Not many birds have had such fruitful longevity. ■

Aircrew Turnaround:

A Skipper's Perspective

By Lieutenant Commander Bob Frantz, USNR-R

The visibility was excellent. Sunday, November 9, 1986, was a clear, Virginia Beach day as 10 *Red Ripper* F-14s streaked across the resort beach, inbound for runway 23 at NAS Oceana, Va. They were part of a 34-aircraft Carrier Air Wing Six fly-in, which ended a successful Sixth Fleet deployment aboard USS *Forrestal*.

For Commander Mike Robinson, *Ripper* C.O. since the previous year, it also marked the implementation of VF-11's turnaround training plan. Although the squadron is not scheduled for major deployment until spring 1988, little time is spared in achieving and maintaining maximum readiness. Robinson explained, "We started working on the plan soon after we deployed last June. The plan covers the turnaround cycle from November 10, 1986, to December 31, 1987. Within two weeks of arrival at Oceana, we briefed Commander, Fighter Wing (ComFitWing) One and his staff.

"It's critical to start the planning process early. Long lead times are required to obtain Topgun quotas for our crews, schedule the squadron for VF-43's Fleet Fighter Air Combat Maneuvering Readiness Program (FFARP), and plan participation in interservice exercises against USAF forces.

"Coordination with the air wing and ship is very important because, most of the time, their scheduling requirements must take precedence. FitWing-1 input is also carefully considered."

Of the 14 aircrews, only eight will make the next deployment. VF-11 will receive 12 new aviators, six pilots, and six radar intercept officers (RIOs) in time for the next cruise. Four of the pilots and four of the RIOs will be nuggets on their first deployments.

The *Red Ripper* skipper tries to make the training job a bit easier by attempting to influence the selection of his new aviators. He said, "It's sort of like a pro-ball draft. We have our spies out, in the [fleet readiness squadron (FRS)], at FitWing-1, and even on the boat. We identify the guys with the good reputations and request them by name. We're looking for different personalities and different talents. We don't want everybody from the same mold. Everybody has something to offer. Opposites, properly managed, bring out the best in each other. The challenge is to be a good listener, see where a guy fits best and put him there.

"I've always felt like we were getting our fair share of the talent, and I hear the other squadrons saying the same thing," Robinson went on. "The [FRS] is turning out a good product and the fighter placement officer and FitWing are doing their jobs in ensuring that each squadron gets an equal cut."

With an influx of new people, especially nuggets, monitoring aircrew performance, particularly during sea periods, is of utmost importance. "Nuggets typically have had very little experience around the boat at night," Robinson explained. "It's important to watch for traits and patterns that, if not corrected, could cause problems. Inputs are solicited and evaluated from landing signal officers (LSOs), pri-fly, the air wing commander and the ship's C.O. Corrective action might mean sending a pilot to a bounce field with an LSO for extra field carrier landing practices."

If the situation doesn't improve, it can lead to the aviator being 'boarded.' That is, the Field Naval Aviation Examining Board could send him back to the [FRS], or it could be career-threatening. It is a decision that is made in collaboration with the carrier group and air wing commanders and the ship's C.O. It is usually a tough decision, but the consequences of not making it could be loss of life or valuable equipment.

Cdr. Mike Robinson is presently attending the Naval War College, Newport, R.I.

Robinson described the AirLant Training and Readiness Matrix as the "bible" of the turnaround training cycle. It is the checklist that drives all training. The C.O.'s job is to find the best avenue to accomplish the identified objectives, thus efficiently meeting the specified requirements.

Budgetary constraints must be considered when developing a training plan. Robinson emphasized, "The name of the game is to break even, if possible. Don't go over budget, but

Above, a cockpit view of Red Ripper F-14s at work. Opposite page, the tailhook on a VF-11 Tomcat snares the number three wire aboard USS Forrestal.

don't fail to take advantage of an opportunity, either."

He cautioned against letting a scheduling opportunity exert undue influence in development of the training plan. "It is important to take a stepping-stone or building-block approach," Robinson said. "We had an opportunity to go to Exercise *Red Flag* last January, six weeks after returning from cruise. With the stand-down and Christmas leave periods, we really had little time to operate as a squadron. The risk of making a mistake was too great and I elected to pass."

Prior to reporting to VF-11 as X.O. in June 1984, Robinson spent two years as FitWing-1 readiness officer. He feels this, more than any previous job, shaped his approach to training. "In that job I was a qualified competitive exercise (COMPEX) observer and participant," he said. "I feel strongly about the contribution that these exercises make in achieving readiness. COMPEXES have been incorporated into VF-11's training plan and include air intercept, air-to-air and air-to-ground gunnery, and missile-firing exercises." Robinson says that COMPEXES make a major contribution to positive attitude and high morale.

At the end of a deployment to NS Roosevelt Roads, P.R., for a major missile shoot, Robinson led the *Red Rippers* to Nellis AFB, Nev., to participate in *Green Flag 3-87*. The Air Force-generated exercise comprises a heavy electronic warfare component. European allies were also represented in the training, which the skipper felt provided a realistic simulation of the current threat.

Robinson considers FFARP participation essential to turnaround training. He explained that it is three weeks of intensive ACM for the entire squadron and a good opportunity for training against the beyond-visual-range, forward-quarter missile threat. "Fighting VF-43's Israeli F-21 *Kfirs* is a good experience for our crews," he said. "Getting in and taking your shot is half the mission but getting out against the high-speed, more numerous *Kfirs* is the tougher half of the challenge."

Cdr. Robinson makes maximum use of Navy Fighter Weapons School (NFWS) programs. He calls Topgun "the best training a crew could receive. If I could, I'd send everybody," he emphasized. "The professionalism and enthusiasm of Topgun is contagious. As FitWing-1's readiness officer, I never had to drum up business for Topgun. The school's image and reputation of being the standard in fighter excellence is such that I personally never met a skipper who didn't want to send people to Topgun."

The VF-11 training plan frequently specifies that lectures conducted in conjunction with, or in preparation for, major training events such as *Quick Thrust, Green Flag*, FFARP and the NAS Fallon, Nev., air wing deployment be presented by an NFWS graduate. Topics include Soviet threat aircraft, surface-to-air missile counter tactics, forward-quarter tactics, and strike planning, among others.

The *Red Rippers* also take advantage of Topgun detachments to NAS Oceana. Their one-week, simulator-based fleet air superiority training is important to their maritime air superiority training. It gives the crews good electronic warfare exposure and an opportunity to work with air and surface elements from the entire battle group. It also helps keep the squadron on step for participation in FitWing sea battle exercises.

The first time the air wing gets to work together is during the Fallon deployment. Robinson sees it as a very important opportunity for VF-11. It gives the squadron a chance to work at its power projection mission, and in its strike escort role by working closely with the attack forces.

Interspersed throughout the turnaround training cycle are sea periods which come along at any time, depending on the requirements of the ship. "We like to start bouncing three weeks before a sea period," the skipper explained. "We also start our shipboard lectures, which include the usual LSO stuff — fly the ball, landing pattern, Case III launch and recoveries (night and heavy weather), water survival and damage control.

"After a bounce period, I'll take a look at the LSO book and talk to the LSOs," Robinson continued. "If we see any traits or patterns that warrant it, we'll talk to the individuals involved. We pair experienced RIOs with new pilots, and one advantage of being a RIO myself is that it makes it easy for me to get a firsthand look at any pilot in the squadron. It's also a good time to identify crew personality conflicts and try to put pilots and RIOs together who are compatible. The bottom line is that if I see someone I think is going to be unsafe at the boat, it's my responsibility to make a move before someone gets hurt," he concluded.

According to Robinson, the most important factor for success is an outstanding maintenance department. "No matter how good your people are and how good your plan is, it all means nothing if you don't have jets to fly."

Robinson said that recruiting good people for the maintenance department is essential. "We rely on our petty officers to let us know who's around and who we want for the team," he said.

"We work very hard, but the troops know up front that hard work is going to be recognized and rewarded and we're going to have fun," he emphasized. "We don't over-manage our supervisors and we delegate responsibility to the lowest level possible."

Cdr. Robinson summed up, "We are fortunate that we have good morale and a reputation as a good place to work. It sounds hokey, and other C.O.s have said it about their squadrons, but it just seems that being a *Ripper* has always been something special." ■

On July 10, 1987, skipper Robinson was relieved by Commander Isaac E. Richardson.

Funding

When I was a junior officer flying AD — and later A-4 — aircraft, I seldom gave thought to how much it cost Uncle Sam when we logged say 3.5 hours in the *Skyraider*, or 1.8 in the *Skyhawk*. Apart from division officer duties and standing watches, our job was to fly the mission.

It's not that we thought bravo funds were unlimited. They certainly weren't. Rather, as JOs, we didn't worry about such things. I suspect that mindset hasn't changed. Nor would I expect it to.

It is our job, at the upper echelons of the Navy organization, to seek the funding necessary — get our share of the pie, so to speak — to ensure that Naval Aviation and its people have the wherewithal to perform the missions assigned. In this regard, I can assure you that we are acutely aware of the need to increase flight-hour funding support. This task is never far from our minds. It should be understood, though, that flight-hour funding is only one part of the complex equation.

It would take a stack of papers as high as the five-storied Pentagon to fully describe the whole process involved in seeking, obtaining and allocating funds. In the simplest terms, there are three major phases in the complicated, tedious and time-consuming process: planning, programing and budgeting.

These phases are carried out, virtually on a continuing basis throughout the Department of Defense (DoD) establishment, year in, year out. For example, we are already working on POM-90, which is the Program Objectives Memorandum for FY 90 and which is submitted to the Secretary of the Navy for approval before going on to the Secretary of Defense and, finally, the president and congress.

In the planning phase, potential threats to our nation are identified and the strategy needed to counter the threats is developed.

Programming entails translating plans into achievable packages, or goals. It is critical that we recognize the limited dollars we have to work with. At the same time, we must consider the ever-changing international situation and adhere to the guidance and policies set forth by DoD. Also, we must ensure that technological advances (a new aircraft or air-to-ground missile, for example) are part of our thinking.

Hughes Aircraft Company

An advanced medium-range, air-to air misile (ARAAM) streaks toward its target during a successful test at the Pacific Missile Test Center, Point Mugu, Calif. This is the first photo released of an AMRAAM launch from an F/A-18 Hornet. "The bottom line...is to obtain the best possible war-fighting capability...."

The POM alone can be 600 pages long. It is an extensive document which includes an outline of what we foresee as the requirements for Naval Aviation in equipment, manpower, logistics and operations support. The POM complements other documents which contain similar information for long-term needs.

The POM is based on inputs from various sources, including fleet commanders, who are closest to the actual action. The bottom line, the prime motivating factor in *our* mindset, is to attain the best possible war-fighting capability we can, within prescribed limits.

In budgeting, we get into the nitty-gritty, the hardcore details. We determine which programs are "executable," and make sure that the justification for the ones we want will hold up against close scrutiny by our superiors. Eventually, we will be called before congressional committees to explain why we need this or that weapons system, or money for a particular program. The push and pull, stretch and bend, are all part of a system which strains the brain — not to mention patience — but it is a system that works.

Examples of some of the biggest categories by appropriation are shipbuilding and conversion, military personnel, aircraft procurement, and research, development, test and evaluation (RDT&E). The largest chunk is dedicated to "operations and maintenance." Funding for flying hours, base operations support, and ship operations are included in this category and cover day-to-day operating costs.

Reiterating, these remarks hardly scratch the surface when it comes to explaining one of our main responsibilities at the headquarters level — garnering the dollars to do the job. If nothing else, I hope it conveys the message that we are deep into the business of supporting fleet and shore activities and, in particular, striving to obtain those precious and indispensable flight-hour funds. ■

Awards

Bravo Zulu goes to USS *America* (CV-66) and VAW-123 on their receipt of the 1987 Secretary of Defense Maintenance Award. The annual award was established to recognize the role of maintenance in keeping our forces ready and sustaining them in combat. The competition also encourages commands to improve their own material readiness and efficiency and to reduce waste.

Most Americans have a hard enough time mastering English, so they don't try to learn a foreign language. Lt. Niel L. Golightly is different. The VF-14 pilot stationed at NAS Oceana, Va., was selected by the George and Carol Olmsted Foundation as the recipient of the 1988 Olmsted Scholarship. The program allows top military officers to study for two years in a language other than English at a foreign university. Golightly, also the recipient of the David Campbell Award for fighter pilot excellence, graduated from Cornell University with a bachelor's degree in liberal arts in 1980. He will study at the University of Konstanz in West Germany.

Some people join the Navy because they want something better for themselves, and AB1 Richard D. Jones may have found it. Jones was selected Atlantic Fleet Aviation Boatswain's Mate of the Year for 1987. Assigned to the catapult test team aboard USS *Theodore Roosevelt* (CVN-71), Jones is one of the catapult safety observers and an integrated catapult control station monitor. AB1 Jones, who was recently selected for advancememt to chief petty officer, was also recommended for a commission through the Navy's Limited Duty Officer program.

Six Naval Aviators from VA-55, NAS Oceana, Va., were each recognized for their participation in the April 1986 U.S. strikes against Libya. RAdm. James E. Taylor, Commander Fighter Medium Attack Airborne Early Warning Wings, U.S. Atlantic Fleet, awarded Air Medals to: C.O. Cdr. Warren C. Chewning, LCdr. Ralph C. Miko, Lts. Robert S. Spratt and Russell P. Knight, and bombardier/navigators Lts. Timothy D. Labelle and Richard C. Harned. Former SecNav John Lehman praised the six officers for exceptional airmanship and performance under pressure. Cdr. Chewning, a Vietnam veteran and three-time winner of the Air Medal, commended his personnel for "superb performance" and assessed them as "nothing short of heroic."

Based on its recent performance during training at the Navy's Atlantic Undersea Test and Evaluation Center in the Bahamas, HSL-94 received the ComHelWingRes East Coast Antisubmarine Warfare Excellence Award. The training contingent comprised Det 5, led by LCdr. Bill Hoffman, and a composite group of squadron personnel under the direction of LCdr. Bryan Lucas.

Commanded by Cdr. William J. Hughes, Jr., the squadron trains and prepares single aircraft detachments flying the SH-2F LAMPS MK I helicopter in antisubmarine and over-the-horizon targeting support of Naval Reserve Force destroyers and frigates.

Rescues

While performing routine open-sea operations in the South China Sea, VP-48's Crew 7 performed two rescues. Operating out of NAS Cubi Point, R.P., Crew 7 had begun open-ocean surface patrols when AT3 Kyle League spotted a small, motionless craft. While making several low passes, the crew noticed refugees signaling the aircraft with mirrors and clothing. Mission commander LCdr. Wayne Beaufort directed the crew to make radio contact with nearby SS *Lucy*. After giving *Lucy* the location of the refugees, Crew 7 orbited the area until all refugees were safely embarked aboard the ship. VP-48 was cited with saving the lives of 43 people of Vietnamese or Cambodian origin. Two weeks later, Crew 7 carried out a similar rescue. Once the refugees were safely aboard the merchant ship SS *Nedi*, the crew continued their patrol operations.

It was liberty as usual for personnel attached to HC-2 Detachment 2. Although deployed aboard USS *LaSalle* (AFG-3), the det was ashore at Manama, Bahrain, to perform routine maintenance on the squadron's SH-3G helicopter, "Desert Duck." At 2150, det personnel learned that a U.S. ship had taken a missile hit. Within 70 minutes, they had returned to the hangar, placed the helicopter in an up status and launched in support of USS *Stark* (FFG-31). Carrying medical personnel and fire-fighting and survival equipment, Desert Duck successfully transferred its load and returned injured sailors to shore from the crippled ship. Det 2 flew 17.5 hours with one helicopter and two aircrews in support of the *Stark* rescue operation, but the most difficult flight for them was the last one, transporting the flag-drapped coffins of *Stark's* crewmen to an awaiting C-141 at Manama for their final voyage home.

Responding to a request from the U.S. Coast Guard, an HS-11 SH-3 *Sea King* crew launched from USS *Theodore Roosevelt* (CVN-71) to provide assistance to two civilian sailors when equipment failure disabled their craft. HS-11 crewmen rescued the two men who were attempting to sail from Point Pleasant, N.J., to St. Augustine, Fla. The men were brought aboard *Roosevelt,* where one received medical treatment. They said they were very grateful to see the Navy helicopter.

Honing the Edge

With the arrival of five Israeli F-21 *Kfir* fighters, VMFT-401, MCAS Yuma, Ariz., became the first Marine Corps aggressor squadron. VMFT-401 is scheduled to receive eight more *Kfirs*, leased from the Israeli government at no cost to the U.S. for four years. The *Kfir*, a single-seat, supersonic fighter, will be used to simulate Soviet MiG-21 and 23 aircraft and will serve as the aggressor, using enemy aerial tactics in air-to-air combat against fighter and attack aircraft and helicopters.

PHAN Chris Marquis

During an Indian Ocean deployment, USS *Constellation* (CV-64) personnel conducted a successful shoot with a NATO *Sea Sparrow* missile. The antiair/ship self-defense weapon is fired once in every 18-month Battle E competitive cycle. The missile was launched when the target was five miles away and intercepted it two-and-a-half miles from the ship.

Reserve squadron VAQ-209, NAS Norfolk, Va., spent 12 days aboard USS *Forrestal* (CV-59) during its annual active duty for training period. More than 100 squadron active duty and drilling reserve personnel, led by LCdr. M. K. Horne, supported VAQ-209's successful flight schedule, flying 85 sorties with a 99-percent completion rate. In addition to intensive flight operations, the crew received training in electronic warfare, surface search coordination, defense air combat, navigation and several shipboard safety procedures.

Norfolk-based VAW-78 joined VAQ-209 on board *Forrestal* along with other squadrons of CVWR-20. Three aircraft and 144 reserve and active duty personnel took part in the training. Skipper Cdr. Bill Castle described the squadron's job as battle management at sea.

"On the Mark" could be VA-304's new nickname as the squadron made a clean sweep during CVWR-30's annual bombing derby and air-to-air gunnery competition at NAS Fallon, Nev. The *Firebirds* of NAS Alameda, Calif., flew more than 180 sorties and delivered more than 800 bombs during two weeks of training. Flying A-7E *Corsair IIs*, the squadron practiced mostly advanced tactical training with the Tactical Air Combat Training System. Led by C.O. Cdr. Dan Kestly, the *Firebirds* team included Cdr. Pete Brady, Lt. Tim Estes and LCdr. Bob Mull, who further distinguished himself by winning the award for best "laydown" bomber in the air wing.

Et cetera

It was "Goodbye, Norfolk," and "Hello, Alameda," for personnel assigned to HM-15. The squadron completed its transition to NAS Alameda, Calif., on October 1. Under the command of Cdr. John W. Tennant, the squadron and its seven aircraft will provide an airborne mine countermeasure capability to the U.S. Pacific Fleet.

Two NAS Patuxent River, Md., pilots were selected as astronaut candidates for the space shuttle program. LCdr. Kenneth S. Reightler and Marine Corps Capt. Andrew A. Allen are among five civilians and 10 other military officers who reported to NASA's Johnson Space Center in Houston to begin a year-long program of training and evaluation.

The Naval Air Reserve is joining with the U.S. Coast Guard in an attempt to stamp out drugs. VRC-4086, NAS Norfolk, Va., began a series of drug interdiction flights which will allow the reservists to fly E-2Cs assigned to Coast Guard Air Wing 1 at Norfolk. The support gives the Coast Guard time to train its aircrews in the newly acquired aircraft. So far, VRC-4086 has participated in four deployments and has logged almost 200 hours in the USCG *Hawkeyes*.

PHCS Ronald W. Bayles

A plane captain prepares to tie down the rotor blades of a Marine CH-46 *Sea Knight* on board USS *Belleau Wood* (LHA-3). A telephoto lens captured this effect of a sea of rotor blades.

On August 20, 1987, Capt. Tom Hoivik, C.O., NAS Willow Grove, Pa., and Capt. Ray Markloff, USNR (Ret.), executive director of the Delaware Historical Aircraft Association signed a support agreement for the association to take possession of an original Pitcairn

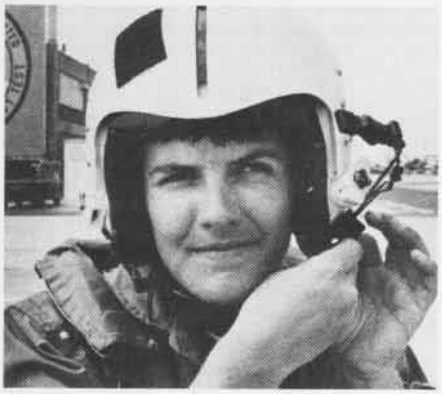
hangar on the air station. The hangar will be refurbished and will become the restoration facility for the Wings of Freedom Museum to be built by the association on air station land donated by the Navy. Upon completion, the multimillion-dollar museum will display artifacts of early military and civilian flights, depict contributions to flight which originated in the region, and provide educational hands-on exhibits demonstrating principles of flight.

PH3 Jennifer Lee Stride, assigned to the NAS photographic laboratory, has become Patuxent River's first female aerial photographer. The 23-year-old Portland, Maine, native fills an aerial photographer "special mission" billet, which does not require aircrew wings.

"Most people felt an E-4 couldn't handle the responsibility and training involved in becoming qualified," she said. But Stride proved them wrong. After completing an aviation physiology examination at Patuxent River and a selected passenger course at NAS Norfolk, Va., — consisting of water survival and the pressure chamber — she began training on high-speed motion picture camera and video and still-photography equipment.

Presently, Stride holds back-seat qualifications for the S-3 *Viking*, T-34 *Buckeye* and most helicopters at Patuxent River. Between flights and other military duties, she occupies her time as a certified scuba diver, an emergency medical technician, volunteer fire fighter and a member of the NAS sailing club.

Stride cherishes her accomplishments. "Pilots and engineers know my capabilities and rely on me. That is the ultimate compliment," she said. PH3 Stride is proving that you can be who you want to be in today's Navy.

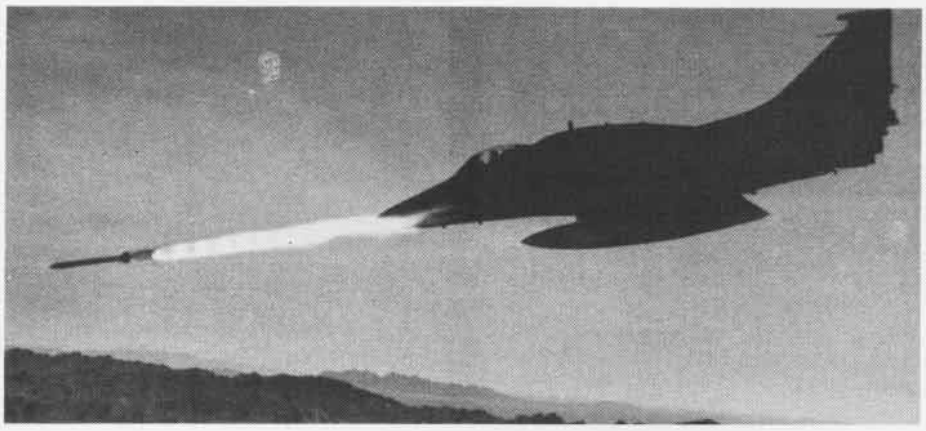


PH1 Michael Wood

PH3 Jennifer Stride thrives on keeping busy. She says, "Life goes by too fast to waste."

F-14 Marks One Million Hours

After 14 years of fleet operations, the F-14 aircraft logged its one-millionth flight hour last March 26. To pinpoint the milestone, the NavAirSysCom F-14 program office, using data compiled by the Naval Maintenance Support Office, reconstructed the flights at the time the one-millionth hour occurred and determined that 25 other *Tomcats* were airborne worldwide. Pilot Lt. Bing Stickney and RIO Cdr. Ed James, C.O. of VF-111, flying the *Sundowners'* F-14 BuNo 160666, were the first aircrew to land and log, thus becoming the captors of the historic record. The introduction of the F-14A (Plus) and the F-14D to the *Tomcat* family, will ensure that the aircraft will continue as the free world's premiere fighter.



VMAT-102 and the A-4 *Skyhawk* marked the end of an era on October 1. The last A-4 replacement aircrew training squadron in active service closed its doors. On that day, the Fleet Marine Force converted from the A-4 to the AV-8 *Harrier* and passed the training mission to MAG-49 Det B, NAS Memphis, Tenn. The squadron had emphasized the fundamentals of air combat maneuvering, deep air strike tactics and close air support. During its 18-year existence, VMAT-102 earned the reputation of "the flyingest squadron in the Marine Corps."

Change of Command

CVW-3: Capt. Jerry D. Norris relieved Cdr. Robert E. Houser.

HS-5: Cdr. Steven J. Tomaszeski relieved Cdr. John T. O'Connell.

HSL-34: Cdr. R. H. Dejaegher relieved Cdr. R. T. Ziemer.

MACS-7: LCol. Gilbert H. Davis relieved LCol. Keith H. Stivers.

MAtWing-1: Capt. R. E. Houser relieved Capt. B. K. McDanel.

MCAS Beaufort: LCol. John J. Sullivan relieved Col. D. A. Richwine.

NAS Bermuda: Capt. David B. Bellamy relieved Capt. Thomas F. Hall.

NAS Glenview: Capt. Carl. R. Karlsson relieved Capt. Ronnie J. Ackerman.

NAS Miramar: Capt. Gary M. Hughes relieved Capt. W. R. Mullins.

NAS Moffett Field: Capt. C. T. Moyer III relieved Capt. H. H. Davis, Jr.

NAS Point Mugu: Capt. Dennis L. Solomon relieved Capt. R. Moon Vance.

NAS Willow Grove: Capt. James R. Shapard III relieved Capt. Thomas H. Hoivik.

NATTC Lakehurst: Capt. John M. Kaiser relieved Capt. Needham H. Lowery.

NS Rota: Capt. J. M. Smith relieved Capt. J. C. French, Jr.

TraWing-5: Capt. Steven W. McDermaid relieved Capt. Robert V. Goodloe, Jr.

VA-37: Cdr. James R. O'Hora relieved Cdr. Jeffrey Harrison.

VA-42: Cdr. Garth A. Vansickle relieved Cdr. Robin Y. Weber.

VAQ-33: Cdr. Dennis E. Fandrei relieved Cdr. Arthur N. Rowley III.

VF-11: Cdr. Isaac E. Richardson relieved Cdr. Michael D. Robinson.

VF-213: Cdr. David L. Bunnell relieved Cdr. Richard J. Bradley.

VFA-25: Cdr. Anthony V. Colantoni relieved Cdr. Jerome L. Arbiter.

VP-11: Cdr. David A. Larson relieved Cdr. Greg A. Markwell.

VS-24: Cdr. Arne Thorgerson relieved Cdr. James Tomanelli.

VT-3: Cdr. James Y. Wallace III relieved LCol. Thomas E. Fitzpatrick.

VT-24: Cdr. Jack D. Dodd relieved Cdr. Terence L. Anderson.

VT-25: Cdr. James R. McKenzie relieved Cdr. Steven L. Counts.

VT-86: Cdr. James E. Linquist relieved LCol. William C. Westfall, Jr.

VX-5: Capt. Eric Vanderpoel II relieved Capt. A. Martin Phillips.

VXN-8: Cdr. Marshall R. Fenn relieved Cdr. Gary K. Iversen.

Flight Test Vehicle

Boeing Aerospace Company was awarded a $5-million contract by the Navy to build 10 flight test vehicles for the Naval Weapons Center, China Lake, Calif. Called "Truck," each vehicle will be used to test and evaluate components and subsystems for air-to-surface weapon systems.

The unpowered Truck will be a test bed to demonstrate such elements as inertial guidance systems, satellite-aided guidance, radio-frequency and fiber-optic data experiments and terminal sensors. Truck will be recoverable, reusable and low-cost with an integral parachute recovery system. The 14-foot-long vehicle will weigh 2,000 pounds and be built of lightweight composite materials. Truck will be designed for launch from the Navy's A-7E, F/A-18 and A-6E aircraft.

Retrofitted S-3As Become S-3Bs

S-3A *Vikings* at NAS Cecil Field, Fla., are having retrofit kits installed, converting them to the S-3B configuration. When the upgrades to the aircrafts' weapon systems are complete, the carrier-based, antisubmarine warfare aircraft will undergo Navy testing before reintroduction to the fleet. The S-3B modification provides advanced acoustic processing, expanded electronic support measures, inverse synthetic aperture radar, self-protection electronic countermeasures and the *Harpoon* cruise missile system. Eventually, 144 Navy S-3As will be modified to S-3Bs.

TAV-8B Harrier II

McDonnell Aircraft Company

The first production TAV-8B Harrier II hovers during a test flight at McDonnell Douglas in St. Louis, Mo. The company recently delivered the two-seat trainer version of the V/STOL jet to MCAS Cherry Point, N.C. The Marines have ordered 328 AV-8Bs, including 28 TAV-8Bs.

Standoff Land Attack Missile

McDonnell Douglas' standoff land attack missile (SLAM) underwent initial fit check tests under the wing of an F/A-18 *Hornet* at Naval Weapons Center, China Lake, Calif. SLAM enables carrier-based aircraft to conduct strikes against unfriendly ground forces from standoff range instead of having to fly over targets, where they are more vulnerable to antiaircraft fire. SLAM combines a *Maverick* imaging infrared seeker, a *Walleye* data link and a global positioning system receiver with a *Harpoon* missile airframe.

Reconfigured T-2

The aircraft in the photo looks like a standard T-2 but it isn't. This reconfigured T-2 is being tested at the Naval Air Development Center (NADC), Warminster, Pa. The aircraft is a one-of-a-kind, with modifications using advanced technologies which are candidates for incorporation in future tactical aircraft.

The test program demonstrates flight application of an 8,000-psi hydraulic system with a combined fluidic and electric fly-by-wire flight control system. The advantages of 8,000 psi over the 3,000 psi, in current aircraft, are decreased weight and increased combat survivability. The new system has worked flawlessly.

The dual fluidic and electric fly-by-wire flight control system replaces the aircraft's conventional mechanical flight controls. All current aircraft flight control computers

are powered by the airplane's electrical system, which presents a common failure mode: if the airplane loses all electric power, it loses its computers. Backup power sources solve the problem. Personnel at NADC believe this T-2 is the first aircraft in the world to fly with a fluidic flight control computer as a primary flight control mode. The fluid that runs the computer is compressed air from the engines. Center personnel say the new configuration actually flies better than the production airplane.

A-6F Intruder

Grumman Corporation

The first of five full-scale development A-6F *Intruders* was rolled out in August at Grumman's flight test facility at Calverton, L.I., N.Y. The first aircraft will be used to test vehicle and aerodynamic improvements and the General Electric F404-GE-400D engine. When it joins the inventory, the A-6F will be the most advanced all-weather attack aircraft ever flown by the Navy and Marine Corps. The twin-engine aircraft will perform interdiction and deep-strike missions and close air support.

AWARDS

Noel Davis Trophy

The 1986 recipients of the Noel Davis Trophy for mobilization readiness are reserve squadrons HS-85, VA-203, VAW-78, VF-301, VP-91 and VR-59. Donated to the Navy by Harry F. Guggenheim, the trophy was first presented in 1927. It symbolizes "the best" in the Naval Air Reserve Force.

The award is named in honor of Lt.Cdr. Noel Davis, a pioneer Naval Reserve aviator who was killed in a plane crash while preparing for the first New York to Paris flight — 24 days before Charles Lindbergh's successful solo transatlantic crossing.

McClusky Award

NAS Oceana's VA-55 received the RAdm. Clarence Wade McClusky Award, which recognizes the "best in attack aviation." F/A-18, A-6 and A-7 squadrons from the Atlantic and Pacific fleets vie for the title. The *Warhorses* fly the A-6E *Intruder*.

Sponsored by LTV Aerospace and Defense Company, the annual award honors the air group commander who distinguished himself while leading a bombing attack on June 4, 1942, during the Battle of Midway. Criteria for selection include achievements in combat, weapon systems readiness and development, aviation safety and personnel readiness and retention.

Davison Award

The *Blue Dolphins* of VA-203, NAS Cecil Field, Fla., were the recipients of the F. Trubee Davison Award for the best Naval Air Reserve tailhook squadron. The competitive period was July 1, 1986, to June 30, 1987.

Sponsored by McDonnell-Douglas, the award honors LCdr. Davison who, while a student at Yale in 1917, anticipated U.S. entry into WW I and organized a group of fellow students to take flying lessons. The group formed the First Yale Unit, which later became part of the Naval Air Reserve.

National Defense Transportation Award

HC-11 was the winner of the 1986 National Defense Transportation Association Award. The *Gunbearers*, based at NAS North Island, Calif., were selected for their outstanding support of fleet units in the Pacific and Indian oceans and the Mediterranean Sea during the year. The annual award is presented to a transportation or logistics unit from each of the military services for the "distinguished conduct of its operational transportation mission."

SecNav Conservation Awards

The following aviation units were FY 86 winners of the SecNav Energy Conservation Award: NAS North Island, Calif., large shore activity; Naval Aviation Depot, Norfolk, Va., industrial activity; and VP-69, NAS Whidbey Island, Wash., aviation squadron.

NAS Patuxent River, Md., was recipient of the 1986 SecNav Natural Resources Conservation Award.

WEATHER FRONT

By Capt. Neil F. O'Connor, USN(Ret.)

CLIMATE

Climate is defined as the "characteristic weather" of a specific place, based upon many years of observations of weather elements. In contrast, the flight plan prepared in "Ops" uses existing and forecast weather. (Existing weather is the state of the atmosphere at the moment.) If you are planning an exercise in the distant future, or the squadron picnic, check climatology data to make certain it is not dead center in the rainy season. The elements of climate important to aviation include ceiling, sky cover, winds, visibility and temperature.

Climatology offers an interesting insight into weather conditions during certain months, such as the typhoon season in WestPac. Then there are the "high-winds" records and the "amazing temperatures" file. Weather persons are not unlike baseball and and football fans. They have a penchant for referencing climatology statistics when discussing a "record-breaking" season — winter, spring, summer or fall, that is!

In all, climate is divided into 13 distinctive types, found in three world zones. Climate has had a major impact on the history of the world and this nation, in particular. Imagine Boston or New York's finest without it! During the weather-related Potato Famine of 1846-1850, the population of Ireland was diminished by 50-percent due to death and unprecedented migration across the Atlantic. Today, many of us of Irish extraction can trace our family roots to the exodus from the "Emerald Isle" during that critical climate period.

PROFESSIONAL READING

By Commander Peter Mersky, USNR-R

Marolda, Edward J. *The Illustrated History of the Vietnam War: Carrier Operations*. Bantam Books, New York, NY. 1987. 158 pp. $6.95.

A small "picture book" such as this paperback could be dismissed as simply another account of the war in Southeast Asia, but this book deserves closer attention.

The author is well-qualified to write on Navy activities in Vietnam. He heads the Contemporary History Branch in the Naval Historical Center and is coauthor of a recently issued volume on the U.S. Navy in Vietnam, published by the center.

Carrier Operations is a well-written, handy reference and, coincidentally, a primer on carrier operations in general. The book discusses the development of the bombing campaigns *Rolling Thunder, Proud Deep* and *Linebacker* in succinct phrasing which conveys the problems that military leaders and men in the cockpits experienced in prosecuting the war.

Several of the many photos are in color, and the overall pictorial selection shows not only the aircraft and better-known personalities among the flight crews, but also the behind-the-scene activities and individuals who directly supported the fighters and bombers that flew over the north.

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Naval History. U.S. Naval Institute, Annapolis, MD 21402.

Most readers of *Naval Aviation News*, and other Navy-oriented publications, are familiar with the U.S. Naval Institute's *Proceedings*, which carries articles of general and specific interest written by both recognized authorities and personnel in the fleet and reserves. Recently, the Institute published another periodical, devoted entirely to historical articles, entitled *Naval History*. In 1988, *Naval History* will appear quarterly and will cost $12 a year for USNI members, $24 for nonmembers.

The first issue of the quarterly was impressive and carried a gratifying mix of quality articles and first-person accounts of periods ranging from Russia's formative naval years under Peter the Great, through WW II and Vietnam. Naval Aviation was well served with stories about WW I operations in Italy, the seldom-told story of the NC-3, and a detailed account of coastal warfare in Vietnam.

Naval History's format is similar to *Proceedings*. For those with historical writing ambitions, the new publication offers an opportunity, and for those who like to read about naval history, it deserves your support.

Basel, G. I., LCol., USAF(Ret.). *Pak Six*. Jove Books, Berkley Publishing Group, New York, NY. 1987. 161 pp. Illustrated. $3.50.

Occasionally, a book appears which deserves to be read by everyone with an interest in military aviation. *Pak Six* is such a book. It tells the story of Air Force F-105 pilots in the hectic days in 1967 during the heavy raids by *both* Air Force and Navy aircraft against North Vietnamese facilities and Viet Cong sanctuaries.

The F-105 was to the Air Force what the A-4 and the F-4 were to the Navy. Originally designed as a tactical nuclear bomber, the F-105 nearly became a plane without a mission. However, Vietnam gave the *Thunderchief*, affectionately called "Thud," a chance to perform, and perform it did. A large, single-seat, single-engine fighter-bomber, the Thud perpetuated the reputation of Republic, its manufacturer, for building tough, capable aircraft. Many F-105s absorbed incredible amounts of battle damage and still brought their pilots home.

The *Thunderchief* also accounted for 27 North Vietnamese MiGs, 24 by 20mm gunfire alone — a feat not duplicated by any other American aircraft in Vietnam. Gene Basel got a MiG-17 on October 27, 1967, during a large-scale attack against railyards near Hanoi. Trying desperately to avoid the heavy flak, Basel found himself at 3,000 feet, boring in on two MiGs intent on attacking a preceding flight of F-105s. Basel fired his 20mm and destroyed one MiG.

It's all here in this little paperback. The emotions, the thrill and the fear, and the deadly fascination with trying to survive 100 missions for the return trip home. Very few books, even when written by the men who experienced them, truly "put the reader in the cockpit." *Pak Six* does that. It is one of the best accounts of combat flying in the Vietnam war that I have ever read.

The Congressional Medal of Honor: The Names, The Deeds. 1984. 1,105 pp. $27.50.

The Navy Cross, Vietnam, 1964-1973. 1987. 372 pp. $19.50.

Both are published by Sharp & Dunnigan Publications, Inc., Box 660, Forest Ranch, CA 95942.

These two books represent major additions to readily available research material on American military history, especially the Vietnam period. Both are presented in a nonillustrated format, giving the name and birthplace of the recipient and the date and place of the action described in the citation.

In *Medal of Honor*, the sequence, though alphabetical and chronological, begins with Vietnam and works backward through Korea, the world wars and the Civil War, when the medal began. Interspersed between these periods are the lesser-known medals given during the Indian wars of the 1870s, Spanish-American War of 1898, period of action in Central America and the Philippines, and noncombat awards such as that given to Charles A. Lindbergh for his solo transatlantic flight in 1927.

Our reviews are too short to do justice to these two books, but there are many surprises in store for those who consider themselves well-informed students of the period covered. This is especially true of the Navy Cross book. As the second highest award presented by the U.S. (after the Medal of Honor), and *the* highest award given by the Navy and Marine Corps, the Navy Cross has long been overlooked by historians and researchers. This book will supply pieces to the never-ending puzzle of the study of military history.

These two collections of the deeds of America's heroes are imposing accounts of patriotism, strength of will and capabilities. Both books will provide hours of reading enjoyment and increased knowledge.

Glenn Curtiss Memorial

In June 1986, the water portion of a unique memorial was unveiled at Lake Keuka, in Hammondsport, N.Y., to honor Glenn H. Curtiss for his accomplishments and association with Naval Aviation. (See *NANews*, September-October 1986, "The Glenn Curtiss Memorial — A Fitting Tribute," page 8). Recently, the land portion of the memorial (in photo) was completed, which consists of a concrete plaza, obelisk and flagpole on the lake's shore.

XN5N-1 Trainer

I would like to know whatever became of the Naval Aircraft Factory-built XN5N-1 trainer and would appreciate hearing from anyone with information on this plane.

William A. Nelson
Box 199B, RD #2
Chester Springs, PA 19425

Military Timepieces

I collect military clocks, watches, chronographs and wings. I seek information on these timepieces/wings, such as technical manuals, listings, etc.

Mike Kirkpatrick
P.O. Box 70224
Bellevue, WA 98396

Reunions, Conferences, etc.

Navy Armed Guard reunion, Toledo, OH. For information, write Leonard Carlson, 5894 N. St. Albans, Shoreview, MN 55126.

Patrol Craft Sailors Association reunion, March 17-21, 1988, Jacksonville, FL. Contact J. Ollie Durham, 3921 Maybreeze Rd., Marietta, GA 30066.

HMM-163 (1967-68) reunion planned for March 1988 in Memphis, TN. Contact Rick Rivers, 200 Wagner Pl., Suite #1004, Memphis, TN 38103, (901) 526-2045.

Corrections to NANews, September-October 1987:

Page 28 — In "Card Stunts," USS Monterey was inadvertently spelled with two r's.

Page 35 — In "National Aviation Hall of Fame," USAF LCol. Virgil Grissom was incorrectly listed as a Marine aviator.

Historical Trivia

Captain William E. Scarborough, USN(Ret.), contributed this bit of historical trivia: The early aviation units aboard USS *Langley* used the cavalry bugle call "Boots and Saddles" to alert pilots to man their aircraft. It was originally employed to call soldiers to mount their horses.

In reply address not the signer of this letter but Bureau of Navigation, Navy Department, Washington, D. C.
Refer to No. NAV-14-GEW A6-3 (A) (7)

NAVY DEPARTMENT
BUREAU OF NAVIGATION
WASHINGTON, D. C.

June 9, 1928.

BUREAU OF NAVIGATION CIRCULAR LETTER No. 37-28

To: All Ships and Stations.

Subject: Bugle Call for Flight Quarters.

Reference: (*a*) CinC, Battle Fleet letter dated January 18, 1928, file S65-4 (373) 15/E(O).

(*b*) Sixth Indorsement of reference (*a*) dated March 2, 1928, file OP-13A-FL, A6-3, (aa)QN/(280228).

1. The U. S. Army bugle call "Boots and Saddles" has been adopted by the Navy as the call to Flight Quarters. This call should be inserted in publications as follows:

(*a*) In "Ship and Gunnery Drills, 1927," on page 350:

119. Flight Quarters.

(*b*) In "Landing Force Manual, 1927," on page 477:

73. Flight Quarters (119).

R. H. LEIGH.

Department Distribution:
I, II, III, IV, V, VI, VII, VIII, IX, X (*a*, *b*, *c*.)

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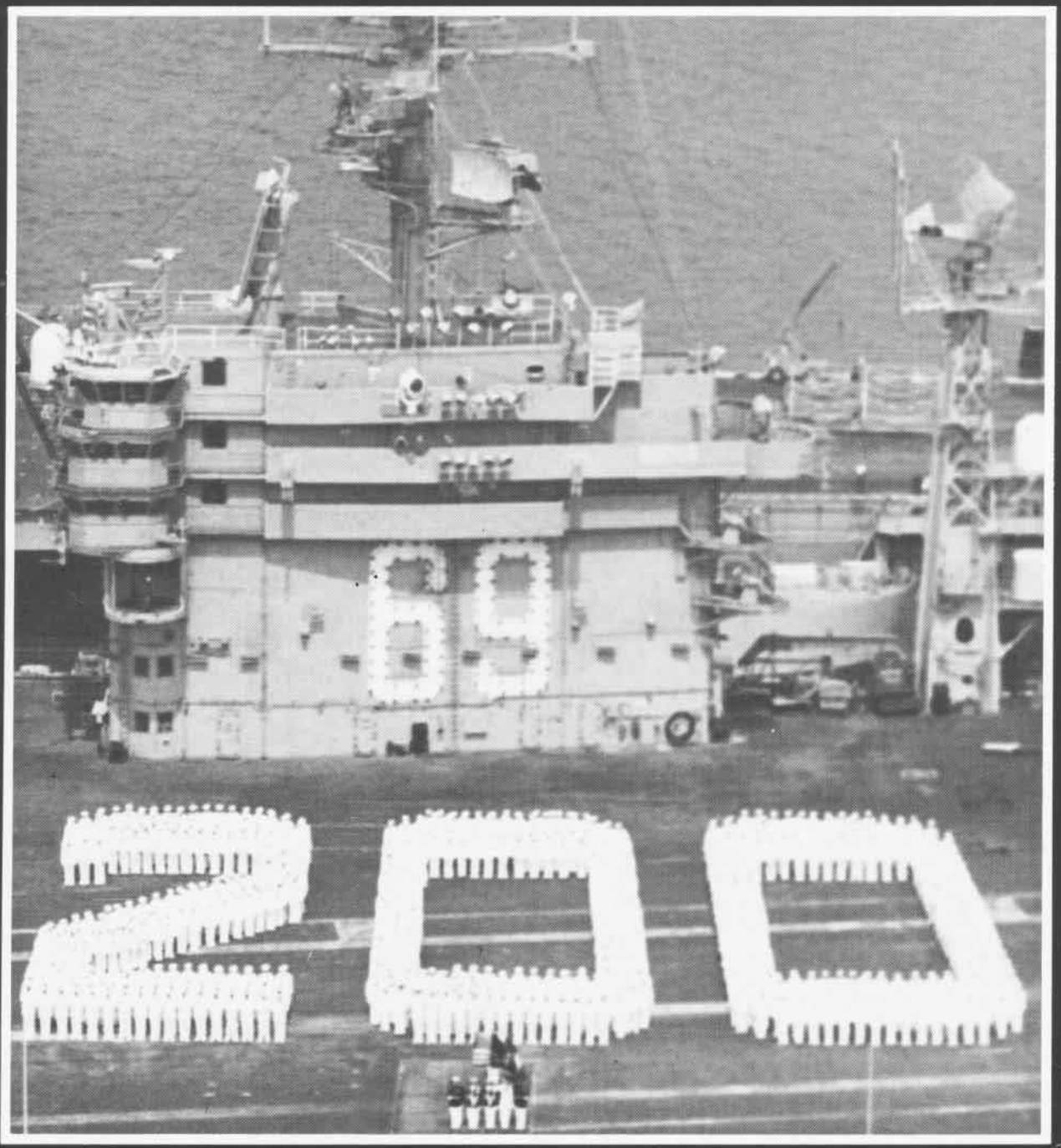

NAVAL AVIATION NEWS