

# NAVAL AVIATION NEWS



**Oldest U.S. Navy Periodical**  
**Sixty-Eighth Year of Publication**  
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Vice Admiral Edward H. Martin Deputy Chief of Naval Operations (Air Warfare)  
 Vice Admiral J. B. Wilkinson Commander, Naval Air Systems Command  
 Captain Rosario Rausa Head, Aviation Periodicals and History

**Staff**

Cdr. Howard A. Wheeler Editor JCS Kirby Harrison Associate Editor  
 Sandy Russell Managing Editor JO2 Timothy J. Christmann Assistant Editor  
 Charles C. Cooney Art Director Sherri R. Jones Assistant Editor

**Associates**

Harold Andrews Technical Advisor Cdr. Peter Mersky Book Review Editor  
 Terry C. Treadwell European Correspondent



COVER—Charles C. Cooney, *NANews*' art director, designed this color rendering of his original artwork for the official 75th Anniversary of Naval Aviation logo.

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DIANA is the new electronic bulletin board that is on line to support the Diamond Anniversary of Naval Aviation Program. If you are a computer buff, learn how you can *log on* to get the latest information on the year's activities and send stories to *NANews*. Page 1.



The annual Grampaw Pettibone Trophy for excellence in Naval Aviation safety communications goes to VA-27. The award is sponsored by Mr. Paul Warner in memory of Gramps' creator, the late Capt. Seth Warner. Page 4.



Touching on all the major programs under way that his OP-05 staff is working on, VAdm. Edward H. Martin discusses "Naval Aircraft Today" to kick off this first issue of *NANews* in the 75th Anniversary of Naval Aviation Year. Page 8.



The P-3 entered service 16 years ago. But it is a long way from being committed to the bone yard. Future NavAir programs promise to breathe new life into this proven airframe and keep it flying well into the 1990s. Page 18.



The E-2C *Hawkeye's* electronic wonders were recently put to the test during the Mediterranean intercept of an EgyptAir 737 carrying the *Achille Lauro* terrorists. The *Hawkeye's* new Bethpage engineering center will help make it do an even better job. Page 22.



The LDO Aviator Program is a chance for sharp, motivated enlisted members to become Naval Aviators and earn a commission. The opportunities have never been better to be accepted into the program. Page 24.

# Electronic Bulletin Board Supports 75th Anniversary Program

By Commander Howard A. Wheeler

If any one type of equipment is symbolic of how far Naval Aviation has come during its 75-year legacy, it has to be state-of-the-art electronics. The high-tech, unforgiving black boxes of today have replaced the guesswork and "Mk-8 eyeball" of yesteryear. Over the years, these electronic wonders have enabled naval aircraft to deliver more firepower with greater accuracy than previously possible.

During an era of information binging, it is no surprise that this milestone anniversary year coincides with widespread and ever-increasing use of micro-computers and electronic data systems. Taking advantage of this 1980's technology, the 75th Anniversary of Naval Aviation Program has entered a new phase by bringing on line an electronic bulletin board called DIANA — Diamond Anniversary of Naval Aviation.

Unofficially brought up for testing early last November, and after two weeks of debugging, DIANA went on line for 24-hour operations.

Accessible by virtually anyone with a personal computer or word processor which can communicate over telephone lines with a modem, DIANA is intended to serve as an open information exchange medium and idea forum available to all individuals interested in the year-long celebration honoring 75 years of Naval Aviation achievements and contributions to our nation's defense heritage.

The bulletin board is entirely menu-driven and contains a great deal of general information that includes lists of points of contact, area coordinators, schedules of national and international anniversary celebration events, historical data and interesting facts, magazine articles published in *Naval Aviation News (NANews)* magazine, answers to commonly asked questions, and selected public domain software. All of this information may be downloaded to any terminal appropriately equipped.

It is hoped that local and national news media, including ship and base newspapers, will access this information data base to obtain timely information on the year's events.

One added feature is DIANA's Electronic Mail which provides a means for exchanging ideas and messages with the 75th Anniversary Project and *NANews* staffs and interested individuals. In this way, users can ask questions and receive all the latest up-to-the-minute information on what is happening worldwide during the Diamond Anniversary Year.

All of the information on DIANA is open access and may be reproduced and published without restriction.

For the computer buffs among the *NANews* readers, DIANA emanates from an IBM-PC XT personal computer with 640KB RAM configured with a Hayes 1200B modem located at the 75th Anniversary Staff national headquarters in Building 159E, Washington Navy Yard Annex, Washington, DC 20374-1595.

Logging on to and using DIANA is simple using straight ASCII characters or XMODEM protocol, and the parameters explained in the sidebar to this article. When you log on the first time, you will be required to give your name, complete address and telephone number, and a password (which you will create on the first log on). From then on you simply follow the menus to find the information you wish.

## Sending Stories to NANews

The 75th Anniversary and *NANews* staffs have been working very closely together for several months as the projects and events unfolded. To also take advantage of the bulletin board, *NANews* will be depending on DIANA as a source of input to the magazine.

Naval Aviation commands or individuals wishing to submit a feature story for publication in *NANews* can do so by logging on DIANA and sending their stories directly and instantly to the *NANews* staff. The article will then be sent to the magazine's word processor for editing and, if approved for publication, typesetting. This will greatly reduce the workload of the staff and enhance the potential for the story to be published.



Naval Aviation commands should, whenever possible, begin to routinely send by this means spot news information to *NANews*, such as awards, changes of command, personal recognition, deployment news, etc. This information will be published in the People, Planes, and Places; Flight Bag; and State of the Art departments.

Instructions for "uploading files" is clearly explained in DIANA.

Photos should be sent by mail as soon as possible. No prior arrangement with the editor is needed.

If the author does not have computer modem telecommunications available, there is one other means of helping the *NANews* staff to get the story into print. The staff has the ability to read text files from over 75 micro-computer diskettes directly into its typesetter. If the story was written on one of the diskette types listed in the sidebar, the author is encouraged to include the diskette with the hard copy of the piece.

*NANews* will be looking forward to its first story received by this method.

## DIANA: Fast and Reliable Information

DIANA was a project taken on by Commander Matt Costarakis, who is one of the 75th Anniversary Program Staff's reservists brought back on active duty. Cdr. Costarakis earned his wings in April 1961 at Corpus Christi after flying the T-34B, the S-2F "Stoof" and carrier qualifying in the T-28C. During his career, he flew the SP-2E with VP-30, and P-2s with VP-5. He left active duty

(continued on p. 28)

# GRAMPAW PETTIBONE

## Last Cross-Country

An A-6 *Intruder* crew launched on an approved cross-country flight from a coastal air station to an inland airfield with a stop en route for refueling. At the stopover point the pilot, a lieutenant, and the \*BN, a lieutenant commander, filed an IFR/VFR flight plan to their destination. They launched and proceeded to the airport but, rather than land, advised the approach controller they would remain aloft. The controller advised the *Intruder* that radar flight following was terminated.

The aircraft continued on to a rural area where the crew, traveling at about 360 knots, made a couple of steep turns about 200 feet above the ground, apparently in view of a relative of the BN who lived in the area, and other witnesses.

After the turns, the *Intruder* climbed to 1,000 feet where it leveled off for a moment then rolled left to the inverted position. It maintained this attitude for two to three seconds, after which the plane continued the left roll. As the maneuver progressed, the descent rate increased significantly and the heading changed about 45 degrees. The airplane continued downward and crashed into a cultivated field at 350 knots in a shallow angle, high rate of descent, right wing tip first attitude, killing both men instantly. Wreckage of the A-6 was strewn over a wide area.



Grampaw Pettibone says:

Almost all wearers of wings want a flat-hat at one time or another. A few give way to such desires. They break the rules. Some get away with it. Some don't.

Ole Gramps has seen reports like this since way back when. They sear my soul as much now as they did then. And oh how they cost in loss of life and dollars.

Unsatisfactory airmanship is one thing. Violatin' regs is another. Together, they can spell disaster.

C.O.'s can't be mind readers but they gotta keep a wary eye on their people and on unit procedures to help prevent disregard for order and discipline before it starts. It's an individual decision whether to flat-hat, but I can tell ya this:



the genuine professional sweeps such thoughts away as if they were poison for the brain.

## Brutal Blast

An evening check crew consisting of three men headed by a petty officer second class, was preparing for a routine jettison check on a squadron F-14 *Tomcat*. Inadvertently, the crew fired four Mk 107 cartridge activated devices (CADs), located in the MXU-611/A fuel tank release mechanisms on aircraft armament stations two and seven. The forward CAD on station two was explosively ejected from the breech and struck the crew leader in the chest, inflicting fatal injuries.



Grampaw Pettibone says:

What an awful price we pay for not using checklists! Supervisors up and down the line oughta hang their heads way down low on this one.

The outfit made a bundle of mistakes that led to the tragedy. Some of the mistakes follow:

- Informed that the *Tomcat* still had CADs installed (CAD removal is required





*Naval Air is celebratin' its 75th birthday all through this year. Ole Gramps wants you to make it the safest one ever, on the ground and in the sky.*

before jettison checks), the work center supervisor violated a unit instruction by failing to direct removal of the CADs.

- Aircraft preparation and fuel tank jettison system checklists were neither present nor utilized.
- Crew member tasked with dearming aircraft pulled ground safety handles and opened doors of MXU-611/As but failed to remove CADs or to disconnect electrical connectors.
- Close proximity of the F-14 mishap to air station fuel pits exposed crew to high noise level, impeding communications.
- Nonstandard signals were substituted to compensate for hindered communications in a high-noise environment.
- Crew failed to use proper two-way communication gear.
- Crew tried to conduct maintenance at night without a flashlight.
- Crew member performing AN/AWN-464 checks left scene to get a flashlight and was absent at time of mishap.
- Crew leader directed master arm "on." This enabled the armament safety override switch in the nose wheel well. The man in cockpit then actuated select jettison switch in response to crew leader command.

The squadron's ordnance teams ap-

parently violated safety procedures routinely and the shift supervisor apparently knew about it! "We only use the checklist when someone's watching," seemed to be the attitude of this crew.

Checklists serve a purpose in this world of high-tech Naval Aviation. Is your squadron on the ball when it comes to using them? If the answer to that question is "No," better do something about it. Now!

### King of the Sea?

An H-3 *Sea King* was cleared inbound to the carrier for a night visual approach up the angle to spot 3. Winds were calm. The pilots could not see the fresnel lens as they neared the ship due to aircraft parked on the after portion of the angled-deck landing area.

The helicopter aircraft commander (HAC) told the copilot, in the right seat, to fly up the port side and slide into the spot rather than proceeding up the angled deck.

The HAC directed a waveoff when he observed another helicopter in spot 3, an A-6 positioned near spot 4, and that the landing signal enlisted was not visible.

Both flyers noted an unusual noise when power was applied but the sound was transient and considered not uncommon when coupled with power addition. The second approach was waved off due to a red deck signal from the tower and proximity of the A-6 to spot 4.

On final for the third approach, the *Sea King* was advised to land a little forward of spot 4. The H-3 proceeded with an acute, nearly perpendicular approach to spot 4. The helo was slowing to a creep and beginning to align with the deck when the HAC noted that the *Sea King* was, at 60 feet, slightly low. (Flight deck height was 52 feet.) The copilot responded by smoothly adding power and beginning a climb. During the power addition, the HAC detected the H-3 yawing slowly to the right.

As the yaw accelerated, the HAC took control and tried to arrest rotation with full left rudder. Control response seemed normal except for left rudder, even though the pedal pressure felt normal. Sensing impact with the ship was imminent, the HAC added full left cyclic in an attempt to turn away. Perceiving a tail rotor malfunction, he reduced collective then reapplied it. The H-3 rotated nearly three full turns then struck the water. The HAC's use of collective cushioned impact. The *Sea King* rolled inverted and sank, but all four crew members egressed successfully.



Grampaw Pettibone says:

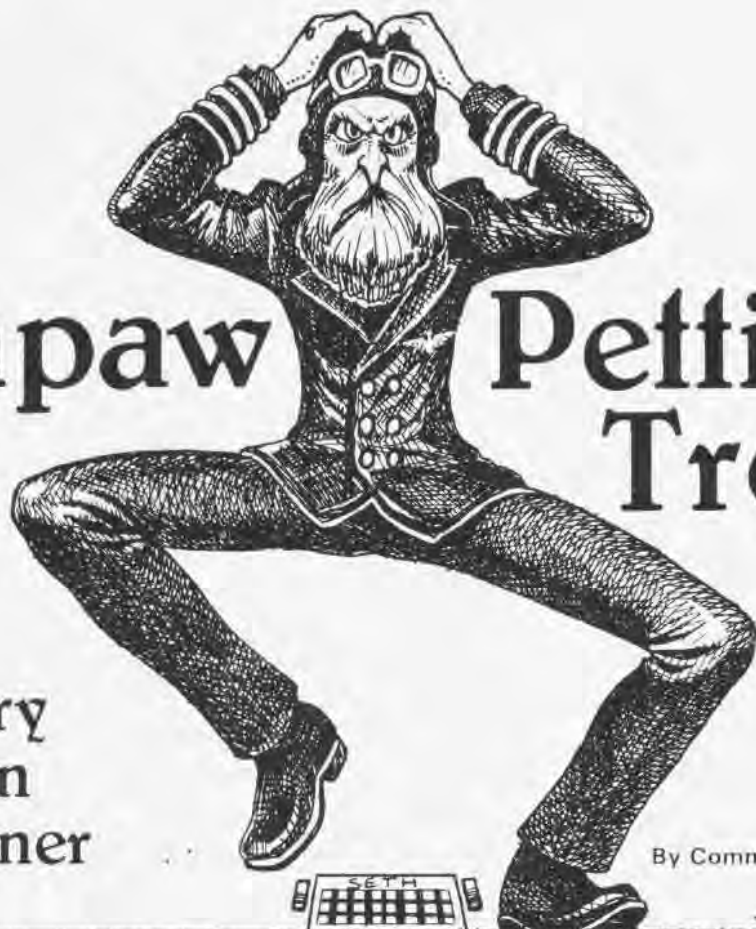
O.K., folks, we lost the helo. Probable cause: tail rotor failure. Thank heaven the troops got out of the sinking bird safely.

Helicopter drivers deserve a better break. When cleared down through the dark night for an angled-deck approach, the pilots have a right to expect an angled-deck approach. The Air Boss is no magician and the helo crew's gotta be flexible — and capable — of flyin' up alongside then slidin' in to the designated spot.

I ain't blamin' any human being for this one. But maybe, just maybe, with a little extra concern for our non-fixed-wing brothers, and better luck movin' aircraft around on deck, the next *Sea King* comin' outta the gloom of night will have a better shot at puttin' down on the spot, first time around.

# Grampaw

# Pettibone Trophy



In Memory  
of Captain  
Seth Warner

By Commander Howard A. Wheeler

**GRAMPAW PETTIBONE, USN**  
1/15/43 - PRESENT



The "Jumpin' Jehoshaphat" annual salute  
by the CNO (and Gramps)  
to the current 4.0 Communicator's efforts  
on behalf of naval aviation safety

This trophy is presented to the U.S. Navy in honor of  
**CAPT Seth Warner, USN**      **LCDR Robert Ottens, USN**  
the Unicomms who created Grampaw Pettibone. Their castaway-to-castaway (and/or life-saving  
badgering) have become a welcome naval aviation tradition.      Fall Warner, 1986

**T**he written word is a powerful medium. If used properly, it can have a profound effect on the thoughts and actions of people. Newspapers, magazines and Madison Avenue advertisers prove this on a daily basis.

Writing, however, is never an easy task. For many, the thought of writing makes them squirm because it requires concentration, discipline, time and a certain amount of skill. Few willingly submit to these demands, but those who do make the effort soon realize the power of the pen.

One Naval Aviator who realized this was Captain Hubert "Seth" Warner, USN, Naval Aviator #2,974. Besides being an outstanding pilot and leader, he was a dedicated and thoughtful man who had the courage to tackle problems when he saw them and come up with solutions.

During his tour of duty in 1942 at the Bureau of Aeronautics, Capt Warner was responsible for keeping track of naval aircraft accident statistics and he didn't like what was going across his desk. He saw an alarming trend in naval aircraft accidents that resulted in many lives and aircraft being lost. After studying the problem, he discovered that the cause of a great many of the fatalities was "stupid, 100-percent pilot error." This particularly troubled him because he had commanded three patrol squadrons, and had the reputation of looking after his men. He was compelled to do something about this needless waste in a lasting and meaningful way.

To deal with the problem, he pooled his five most valuable personal strengths — professional competence, imagination, wit, persuasiveness, and writing talent. With his knowledge of aviation, and imagination, he conjured up an image of "the oldest and wisest Naval Aviator;" his wit gave this "sage of safety" a feisty sense of humor; his persuasiveness convinced a young artist he knew — reserve Lieutenant Robert Osborn — to give shape and form to his idea, and his writing gave this characterization a means to openly express his feeling about the tragically dumb things aircrews were doing.

The outcome was *Grampaw Pettibone* — the personification of Naval Aviation's safety conscience.



Above, Capt. Seth Warner. Left, an artist's rendering of the Grampaw Pettibone Trophy.

Grampaw Pettibone was destined to jump off the pages of every issue of *Naval Aviation News* for decades, ranting and raving about accidents that could have been prevented if sound judgment and good headwork had been applied.

Gramps' mission was serious business and, to avoid being morose, Warner gave him a real personality and an unforgiving sense of humor. In this way, the lessons learned would make a more lasting positive impression.

January 15, 1985, marks Grampaw Pettibone's 42nd year of promoting Naval Aviation safety Through Gramps; the Naval Aviation community has been able to learn, and hopefully not repeat, its mistakes. Surely, hundreds of lives have been saved and countless accidents prevented as a result of Gramps' persistent intolerance for neglect, shortcuts and unprofessionalism.

Capt. Warner saw Gramps do his thing for a little over 24 years before he died on January 19, 1976. His well conceived program on communicating safety awareness, however, did not die with him.

The legacy of Grampaw Pettibone continues in the pages of *Naval Aviation News* and the minds of its readers. But one person felt that it would be fitting to make it even more durable, visible and significant.

That man is Seth Warner's son, Paul Warner, 55, who is vice president and part owner of a marketing and sales company, A.T. Hunn, Inc., in Oakland, Calif. His idea was to commission a bronze statue cast in the image of Grampaw Pettibone and use it as a perpetual trophy that would annually honor excellence in Naval Aviation safety communications. He proposed this to Vice Admiral "Dutch" Schoultz in 1984,

then Deputy Chief of Naval Operations (Air Warfare), who liked the idea. Later, the Grampaw Pettibone Trophy was announced in OPNAVINST 3590.19F.

The first recipient of the Grampaw Pettibone Trophy is VA-27 for its squadron-wide aggressive safety writing program (see sidebar on page 7).

Paul Warner's memories of his father greatly influenced his decision to produce the Gramps trophy project. He says, "My Dad really handled me well and in a realistic way. We were very close."

For Paul, life as the son of a Naval Aviator was exciting during the 1930s and 40s. He says, "I went to seven different schools before I started high school — from Hawaii to Washington, D.C., to Coronado, Calif. That was kind of fun because by the time you went back into certain areas you ran into people you'd met before who were also traveling around the United States. I enjoyed it. I think it's one of those things that either fits the person or it doesn't. In my case, it probably helped me in my future business, because when you went into a new school, you always went in cold and had to become quickly acclimated."

When asked what was the most memorable tour with his father, Paul recalled, "Hawaii, before WW II. It was a good period for us, and in the United States. In the late thirties, when Dad was C.O. of VP-10, there were only two hotels on Waikiki Beach. There was time to enjoy the environment and that's when Dad picked up tennis, which he had played at the Academy. During that tour, he won the Men's Open Singles."

Seth Warner believed in staying in shape. "At the Naval Academy, he was a good basketball player, and made his letters in lacrosse and football," said Paul. "He was always trim, very fast and very coordinated. He was a natural athlete." Paul recalled one situation that demonstrated his father's seemingly natural agility and fitness. "When I was an undergraduate at Stanford University, between football and track seasons, I thought I'd take gymnastics just to keep myself limber. In the first week I learned how to do a back flip and thought that was pretty good. I went home one weekend to Carmel where Dad happened to be watering the front lawn. I got out of my car and said, 'Hey, Dad look what I can do' and did a back flip for him. He was 55 at the time and said 'Son, that's pretty good.' Then he did a flip just like I did without even warming up. He was a real sports

model for me."

Seth Warner was the epitome of what a Naval Aviator should be. He was a bright and sensitive officer, and a skilled aviator who lived up to his own high standards. His attitude of being supportive to those around him not only included his Navy peers.

When Paul was studying radio and television at Stanford, he and two friends produced a radio show which was eventually taken over by one of the local radio stations near the university's Palo Alto campus. They had a 13-week series of half-hour programs and Paul wrote most of the material. The radio station couldn't reach Carmel, so every time Paul's program was aired, Seth Warner would take his wife in the family car and drive north toward Stanford until the signal was strong enough to be received on the car radio — a distance of nearly a 100 miles. He'd then pull off on the side of the road and attentively listen to the broadcast. When it was over, they'd turn around and return home. Paul says, "That was for me personal support. He really went out of his way... He didn't

say, 'Well, I wish I could hear it son.' He went until he could hear it. He went the distance."

Seth Warner went the distance in more ways than one. In January 1938, as a lieutenant commander, he made headlines by leading a flight of 18 PBV-2 patrol planes on a 20.5-hour, nonstop flight from San Diego to Pearl Harbor. It is believed to be the longest flight for that number of aircraft ever — a distance of 2,553 miles. It was a difficult trip that involved dodging headwinds and stormy weather.

Paul remembered this mass flight very well because it showed him the self-confidence and courage his father possessed. He said, "We got to go to the tower at Ford Island and listen to Dad on the short wave radio. During the first third of the trip, they ran into some bad weather and had to climb high to go over it. While they were at 13,000 to 14,000 feet, Dad was checking the other

New pilot Seth Warner with pet Stutz "Bear Cat" in 1923.

crewmembers and nobody was answering. He discovered that all had passed out, including his copilot, because of lack of oxygen. Dad, in his unassuming way, calmly reported the situation and returned to Coronado. He was cool and casual about the whole matter."

Their relationship grew closer over the years and, in 1965, Seth and his son agreed that it was time to do some estate planning in the event that "something should happen." For the next two years they jointly worked on establishing a family trust. Then, Paul says, "One Friday night he called me about nine o'clock and his opening line was, 'Paul, can you lend me a dollar?' I said well of course. But, why? 'Just an hour ago, Paul, I signed the trust and the bank owns everything. It is exactly the way you and I discussed and everything is all taken care of.' Dad was such a responsible man, it was like he had taken his whole life and wrapped it up with a ribbon." Seth Warner, at 71, died of a stroke an hour later.

Paul offered a few clues to what inspired his father to create Gramps. "Looking back on this, my father was struck by the numbers of accidents due to pilot error, not due to enemy action. He focused on that as being his objective, his goal, his charter. That became something he lived with and thought about, and chewed on, and got mad about, and got sad about. He revealed to me the intensity of his feelings about this matter. I was 12 at the time. He worked on the idea for a long time and came up with Grampaw Pettibone. He took it to heart. Then he got lucky and found Robert Osborn. The concept of Pettibone would have remained just that, an idea, had it not been *visualized*. The idea would not have survived without Osborn. Those two together made it happen. Pettibone took on depth when Osborn drew him. To make Grampaw Pettibone take hold, Dad and Osborn both had to be in existence. Dad's the essence of Grampaw Pettibone — Gramps' interior. Osborn was the exterior. That's why it fit."

Grampaw Pettibone's column is the longest running and, according to readership surveys, consistently the most popular section of *Naval Aviation News*, even among nonaviation readers. Paul Warner believes this is true because, "There is a respect for Grampaw Pettibone's knowledge. I respect my Dad for his knowledge, and the experiences we had together. He was wise but not pushy about it. Gramps has a platform on which he jumps up and down, Dad did not do that. That is one





characteristic in Gramps that was not a part of him. He was not ostentatious. He did things low key. He was satisfied and comfortable enough with himself to be low key and be remembered as a competent and professional person."

The memories of Seth Warner prompted Paul Warner to sponsor a Grampaw Pettibone Trophy. "It made me think about some of the most important things in my life. One of them was Dad's

importance to me. After thinking of all these stories and after having lived with him and gone through a lot of personal and professional moments, I began thinking of how to best honor the good man that he was. For me the appropriate thing to do was to honor those he cared so much about. And what better way to do this than to immortalize him with the Grampaw Pettibone Trophy that will recognize those who support Naval

Aviation safety, as my father did."

Seth Warner used his imagination and his pen to make generations of the Naval Aviation community sit up and take notice of safety. As Grampaw Pettibone continues to appear on the pages of *Nava/Aviation News*, with the long-term support of Robert Osborn, Seth Warner's dream of saving lives also endures. This is another testimony to the power of the pen. ■

## VA-27 Earns Grampaw Pettibone Trophy

By JO2 Timothy J. Christmann

About three years ago, the commanding and executive officers of Attack Squadron (VA) 27 devised a scheme to improve the communication skills of their junior officers. Little did they know, however, that their unique idea would later help earn the squadron seven of the last eight Commander Light Attack Wing, Pacific Fleet quarterly safety awards as well as the first Grampaw Pettibone Trophy.

According to Commander H. D. Connell, he and Commander Joe Hart, who preceded Connell as C.O. of VA-27, wanted the squadron's junior officers to have the necessary basic writing skills to succeed in the Navy. So, in 1982, they began lecturing their officers on how to become better communicators.

"We wanted them to learn how to proofread their work better, and how to improve their ability to get their ideas across without a lot of bureaucratic [verbiage] which only confuses people," said Cdr. Connell, who was X.O. of VA-27 from November 1981 to May 1983 and C.O. from then until October 1985. "The program went well until we stopped lecturing and requested them to submit articles. Then there were a lot of groans."

At the time, A-7E *Corsair II*-flying VA-27 was deployed aboard *Coral Sea* and the C.O. of the ship requested that every squadron submit three to four articles as part of a press package. So, each VA-27 officer was ordered to write one article about safety. Cdr. Connell said that most of the officers, particularly warrant officers, who lacked a college education, were terrified of doing any writing assignment. After all, most of VA-27's officers joined the Navy to fly jets off aircraft carriers, learn how to place payloads on targets, and perhaps become adept at managing people and equipment. But writing? That was a job for journalists.

To allay their fears, Connell said that the squadron organized an editorial

board staffed with officers who had writing experience to help the novices.

"As it turned out, once the guys who were afraid of writing found out their articles would get published and carry a by-line, they didn't mind it so much," said Cdr. Connell. "In fact, we received so many submissions that we sent in 20 [instead of the requested three]."

Since the *Coral Sea* deployment, it has been mandatory for VA-27 officers to submit at least one article each quarter for publication. And the deadlines are strict. In fact, Cdr. Connell said that once a VA-27 department head was refused liberty because he owed the C.O. an article. Laughed Connell. "The officer submitted his article within three hours and left the ship a happy man."

Although enlisted personnel are not requested to submit articles, many of the more than 80 stories written by the squadron each year are by petty officers and nonrated personnel. According to Lieutenant Commander James Kidrick, VA-27's Operation's Officer, the articles don't have to be only safety-related. "The articles can be of a general professional nature," he said. "It just so happens that most of our articles, at least 90 percent, are safety-related."

According to Cdr. Connell, who was relieved by Commander J. P. Sciabarra in October 1985, the articles have ranged anywhere from one typed page to 25 typed pages in length. Topics have concerned everything from aviation and automobile safety to flying tactics and material management. Over the years the articles have been published in a variety of periodicals, including U.S. Naval Institute *Proceedings*, *Tailhook*, *Approach*, *Mech. Fathom*, *Driver*, the *Naval War College Review*, and of course *The Golden Eagle*, the base newspaper at the squadron's home at NAS Lemoore, Calif.

According to Peter Mersky, an editor with *Approach*, VA-27 has been

"unparalleled" in the quantity and quality of their submissions."

Cdr. Connell is a strong advocate of this method because he feels it enhances the safety awareness of all hands, improves communication, and provides good public relations for the squadron. In addition, he said that having squadron personnel write articles that are published with their by-lines helps build morale and enhance team spirit.

Although few squadrons have pursued this method with as much dedication and zeal as VA-27, Cdr. Connell believes this will change. He said this not only because he thinks it's a smart program, but because nowadays squadrons' earn points toward safety awards if their personnel have safety-related articles published in Navy newspapers and magazines. VA-27 knows how important this is. The squadron has won the last four consecutive ComLATWingPac quarterly safety awards and recently became the first recipient of the Grampaw Pettibone Trophy. This award will be given annually to the squadron that does the most in communicating safety (either in the print or electronic media).

Lt.Cdr. Kidrick said that it was gratifying to most of his fellow squadronmates to receive the the Grampaw Pettibone award because "it isn't easy submitting stories each quarter when you are busy working on other squadron duties." He added that VA-27's writing program is beneficial because it makes people think more about safety and thereby improves the squadron's overall safety climate. Yet by getting articles published regularly in Navy periodicals, VA-27 personnel are doing more than improving their own safety record. They are spreading their awareness to personnel in other Navy squadrons who, unfortunately, aren't taking advantage of this successful program. ■



Photos by JOCS Kirby Harrison

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# Naval Aircraft Today

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By VAdm. Edward H. Martin, DCNO (Air Warfare)

**N**aval Aviation breathed its first breath of life 11 years into the 20th century when it bought its first aircraft, an A-1 Curtiss biplane.

Although its flying capabilities were marginal, the knowledge gained in the A-1 gave way to more advanced, and more capable, naval aircraft.

Upon this adventurous beginning, the Naval Aviators, Naval Flight Officers, aircrewmembers and ground maintenance personnel before us have built a legacy of courage, achievement and victory. In every major conflict since the turn of the century, Naval Aviation has been present. The

courageous wartime deeds of the flight crews and the superior performance of the aircraft which were expertly maintained by hardworking ground support personnel are a testimonial of their dedication as a winning team.

The entire Naval Aviation community during this milestone year deserves to share in the pride of this great heritage.

But the future begins today, and we all share in the responsibility to continue the tradition of successes that Naval Aviation has enjoyed for seven and a half decades. Those on active duty and in the reserves are part of what will surely be a greater story yet to be told. It will be a story of peace founded

on a strong deterrence, of which Naval Aviation is a significant part, and strength placed in responsible hands.

A great deal of our nation's deterrent power is Naval Aviation's responsibility, and how we manage it will have great impact on the future.

Sophistication seems the most apt word to describe the systems of Naval Aviation today compared to the rough-hewn flying machines of yesteryear.

Today, Naval Aviation is approaching a dramatic phase in its evolution which will result in major changes in carrier air wing composition, aircraft design, and weapons. And as the weapons systems change for the better, so does the way we employ our forces.

The forerunner of the new hybrids on the horizon is the F/A-18 *Hornet*. This revolutionary fighter and attack-capable aircraft has already begun changing the carrier air wing mix from the conventional 24-fighter, 34-attack blend to a new mix of 20 fighters, 20 medium-attack and 20 fighter/attack aircraft. This new structure allows the carrier to protect itself with 40 fighters, press the offensive with 40 attack aircraft, or tailor fit the aircraft mix to the task at hand.

It seems that the limit of United States technology is the only barrier to future aircraft design and capability. New lightweight structural materials, computer miniaturization and high-speed processing, fiber optics, improved engine efficiency and improved avionics are combining to produce aircraft with small radar cross sections, better maneuverability, higher velocities, less fuel consumption, and high-technology avionics which span the entire spectrum of light and electromagnetic radiation to provide targeting data or threat warning protection.

Increased computer processing ability will allow electronic management of targeting systems, threat sensors and navigation, thus freeing the crew to concentrate on flying the aircraft, tactics, and weapons use. Improved weapons guidance systems will be the fire-and-forget variety. Autonomous weapons targeting will permit the weapon to acquire new targets independent of the launch platform in case the primary target is destroyed or acquisition is lost prior to weapon arrival. Advances in stealth technology, low observables, electronic warfare and passive search and track (infrared and electro-optical) when combined with longer weapon ranges, higher velocities and a wider range of



Top, an F/A-18 Hornet from VFA-106 clears Forrestal's deck during carrier qualifications off the Florida coast. Above, filled with airborne early warning gear, an E-2C Hawkeye is launched from the carrier.

weapon launch parameters will lead to more innovative tactics based on enemy confusion and surprise.

Not all technological innovations will be centered on in-flight performance. Ground support will be simplified by modular design, longer mean time between failures, rapid rearming, and commonality of parts and components. Reductions in maintenance requirements have effected squadron manning requirements and the design of squadron spaces aboard the carrier.

Major initiatives are under way to upgrade virtually all naval aircraft, thus providing mission service beyond the year 2000. These aircraft include the A-6 *Intruder*, EA-6B *Prowler*, AV-8B *Harrier II*, F-14 *Tomcat*, F/A-18 *Hornet*, E-2C *Hawkeye*, P-3 *Orion*, S-3 *Viking*, OV-10 *Bronco*, SH-60B *Seahawk*, SH-2F *Seasprite*, SH-60F *Seahawk*, CH-53E *Super Stallion*, MH-53 *Sea Dragon*, AH-1T *Sea Cobra*, V-22 *Osprey*, and the T-45 *Goshawk*.

The largest share of our fiscal resources goes to the procurement of those aircraft and weapons which we need to keep Naval Aviation strong, young and vital. To achieve our goals, the aircraft and weapons, with supporting equipment, must incorporate our most advanced technology in order to improve the overall lethality and visibility to our force structure. We must also strive to improve our sustainability by modernizing our forces with the assets necessary to accomplish our peacetime missions while simultaneously preparing the necessary war-fighting means.

### The Aircraft

The following is a rundown of all the aircraft in the Naval Aviation inventory that will continue to be upgraded into the 21st century.

**A-6E Intruder** — As the Navy's only all-weather attack aircraft, the *Intruder* incorporates a solid state weapons release system, a single integrated track and search radar with a moving target indicating system, and an inertial navigation system. The A-6E also provides pathfinder/strike leader functions for strike groups. Powered by two J52-P-8B engines, the aircraft has a combat speed of 500 knots at 500 feet when configured with 28,500-pound bombs.

An added capability, target recognition attack multisensor (TRAM), has also been procured since 1976. This major subsystem includes an infrared sensor, a laser ranger/designator and a laser receiver. TRAM gives the *Intruder* the capability to deliver laser-guided weapons and markedly improves its night surveillance and identification capability.

The A-6E inventory is currently 353. Another 18 aircraft are under procurement.

A significantly improved model of the *Intruder*, the A-6F, is now under development with a fixed-price, research and development contract. The A-6F will emphasize improved reliability, performance and survivability through selection of higher thrust F404-GE-400D engines, modern digital avionics, and vastly improved radar and wing structural design. It will include provisions for virtually all state-of-the-art, stand-off weapons scheduled for production at the planned A-6F introduction date in early 1990. Procurement for this aircraft has already begun.

We discovered that the fatigue life of the A-6 wing did not exceed the contract specification as had been hoped. We

hoped that the wing life could be extended as much as 100 percent to 4,400 hours. This was not possible and, in examining alternatives, we have competitively awarded a contract for the design and production of a new wing. Our goal is the 4,400-hour wing to be available in 1988.

The 'new' wing will be incorporated in the new production A-6Es and A-6Fs.

The Navy is looking to replace the A-6 in the late 1990s. We are at the point of conceptual design for this potential replacement aircraft; what it is going to do, and how, is in the conceptual phase only.

**EA-6B Prowler** — A four-place, twin-engine derivative of the A-6 *Intruder*, the *Prowler* is a fully integrated electronic warfare weapon system that combines long-range, all-weather capability with advanced electronic countermeasures and electronic support measures systems. It can carry up to five jammer pods which house the high-power jamming transmitters capable of operation against various threat emitters.

The primary mission of the EA-6B is to support strike aircraft

and ground troops and provide a counter-targeting capability for battle groups by suppressing and degrading an enemy's electronic systems through tactical jamming. Secondary missions include passive early warning for fleet defense and obtaining tactical electronic intelligence within a combat area. The EA-6B is the only carrier-based aircraft which provides all these capabilities.

The *Prowler* inventory is currently 76. Twelve more are being funded.

**AV-8B Harrier II** — An improved vectored thrust V/STOL aircraft, based on the AV-8A concept and utilizing the Pegasus II engine, the AV-8B has up to twice the range or payload of the older *Harrier*. It combines aerodynamic improvements with an angle rate bombing system for increased weapons delivery accuracy and it has a new stability augmentation system to reduce pilot workload. The result is a much more capable and reliable aircraft. The AV-8B will meet the Marine Corps requirement for a light attack aircraft to provide responsive offensive air power that can operate from austere forward sites in direct support of ground forces.



There are currently 20 *Harrier* IIs in the Naval Aviation inventory. Forty-six are being funded.

**F-14A Tomcat** — The F-14A is a high-performance, maritime air superiority fighter. It is a two-place, variable-sweep wing, supersonic, carrier-based airborne weapons system. The F-14 has visual attack and all-weather capability to deliver up to six *Phoenix* missiles, plus *Sparrow* or *Sidewinder* missiles and an M-61 gun for close-in air-to-air combat. The *Phoenix* is unique because it is the only air-to-air missile in the world that can hunt a target more than 120 miles away at speeds up to Mach 5 (or more than one mile per second).

The F-14 is powered by twin TF30-P-414A engines. Beginning with the last aircraft in FY 86, the F-14A will be procured with a new engine, the General Electric F110, which will provide major improvements in both safety and performance. A major upgrade of the F-14 *Tomcat* is planned in both safety and incorporation in FY 88. The upgrade enhances operational capability with improvements in electronic counter-counter measures in the radar and digital

avionics suite.

The F-14D will feature a 30-percent increase in thrust, improved reliability, maintainability and upgraded avionics compared to the F-14A. The F-14D's heads up display and multifunction displays should make optimum use of technology already proven through the *Hornet* and *Harrier*. The advanced radar should improve capability in a severe electronic warfare environment and reduce radar intercept officer workload. Naval Aviation will begin procuring the F-14D in 1988.

The F-14A's safety record has been remarkable. In 1984, it boasted a 3.61 mishap rate per 100,000 flying hours.

The F-14A *Tomcat* inventory numbers 428. Eighteen more are being funded.

**F/A-18 Hornet** — The F/A-18 strike fighter is a twin-engine, mid-wing, multimission, tactical aircraft. The F/A-18 is employed in both Navy and Marine Corps squadrons.

A fully combat-capable, dual-cockpit version, the TF/A-18, is used in the Marine Corps tactical air control (airborne) mission and as a training squadron aircraft.

The *Hornet* can be configured to accomplish specific fighter or attack missions through the selected use of externally mounted equipment. This capability provides the operational commander more flexibility in employing his tactical aircraft in a dynamic scenario.

The F/A-18 is the Navy's first strike fighter, designed for such traditional strike (attack) applications as interdiction and close air support without compromising fighter (escort and fleet air defense) capabilities. The result is a strike aircraft with the same airframe, engine and flight control systems used for a fighter aircraft. Excellent fighter and self-defense capabilities will ensure strike mission survivability.

Development of an austere all-weather attack capability for both single and dual-cockpit aircraft began last year in conjunction with the addition of a navigational forward-looking infrared radar and night-vision goggles. This allows the F/A-18 pilot to visually navigate to, and attack, targets at



Far left, A-6 Intruders line Kennedy's deck during a Med deployment. Note the FLIR pods under the nose of each aircraft. Left top, nose up, an F-21 Kfir from adversary squadron VF-43 is launched at NAS Oceana. The squadron's 12 Kifirs are on loan from the Israeli Air Force. Left bottom, a U.S. Marine Corps CH-53E visits the battleship Iowa during recent operations.

night with virtually the same accuracy as in daylight.

Nine Navy and Marine Corps *Hornet* squadrons are operating today from eight air stations and two aircraft carriers. Total flight hours exceed 100,000.

Last year, the commander of a carrier group which was evaluating the F/A-18 aboard *Constellation* sent me a message which read, "*Hornet* integration into the fleet has been exceptional. Significant accomplishments during the operational readiness evaluation included a demonstrated 500-nautical-mile, long-range strike capability and the first F/A-18 night supersonic AIM-7F *Sparrow* shot at a supersonic drone resulted in a direct hit.

"The radar system availability was 100 percent... Overall, the F/A-18 availability averaged 97.2-percent mission-capable [compared to the 70-percent fleet goal]." The message went on to read, "Despite growing pains, fleet introduction of the F/A-18 has been extremely successful, unquestionably the smoothest entry of a carrier-based aircraft into the fleet in recent history. The F/A-18 is a force multiplier that adds significant flexibility and punch to the battle group. The full potential has yet to be demonstrated, but what we have seen to date has been impressive."

The Navy has 154 F/A-18s with another 84 in procurement.

**E-2C Hawkeye** — The E-2C is an all-weather, carrier-based, airborne early warning (AEW) aircraft. It carries a crew of five: pilot, copilot, combat information center officer, air control officer and flight technician. The E-2C has a high wing, a 24-foot rotodome mounted above the fuselage and is now being powered with two T56-A-427 turboprop engines.

The E-2C extends task force defense perimeters by providing early warning of approaching enemy units and by vectoring interceptors into attack position. In addition to this function, the *Hawkeye* also provides strike control, air traffic control, radar surveillance, search and rescue assistance, communications relay, and automatic tactical data exchange.

Fiscal year 86 began the major update of the E-2C's electronics suite which will ensure the aircraft's AEW advantage against the threat through the 1990s. The increase in aircraft weight due to these improvements and other structural modifications has brought about the urgent requirement for the upgraded T56-A-427 engine.

Naval Aviation currently supports 78 E-2Cs with six in procurement.

**P-3C Orion** — The P-3, the Navy's shore-based, long-range antisubmarine warfare aircraft, has been in production since 1969 and has enjoyed an evolutionary development of its sensor systems through a long series of update programs. The latest improvement is Update II which adds the proteus advanced signal processor, significantly improving the *Orion's* ability to detect, track and attack quieter, new-generation Soviet subs. The first Update III P-3C aircraft entered fleet service in May 1984. Currently under development is the Navy's Update IV, which will increase the capability to counter the Soviet submarine threat. This modification is scheduled to enter the fleet in 1991. Naval Aviation has 24 active P-3 squadrons, 21 of which operate the P-3C and three which fly the P-3B. There are also 13 reserve squadrons flying P-3As and P-3Bs.

The P-3C inventory is currently 232 with nine aircraft in procurement.

**S-3A Viking** — The S-3A *Viking* is a twin-engine jet, carrier-based, antisubmarine warfare aircraft which carries a crew of four. Its speed, range and detection capabilities make

it highly effective as a component of a carrier battle group's ASW posture, and for use in such missions as mining, command and control, threat warning, and surface surveillance/identification/classification.

The S-3A is no longer in production. A weapon system improvement program, or WSIP, will retrofit avionics and weapons subsystems to counter the submarine threat of the 1990s. The resultant S-3B will incorporate state-of-the-art technology for increased radar detection range and classification, advanced acoustic processing, increased electronic support measures capability, and integration with the *Harpoon* missile. Current plans call for conversion of 160 S-3As to S-3Bs.

**Light Airborne Multipurpose System (LAMPS)** — Two types of LAMPS helicopters are employed on our surface combatants to maximize their ASW and antisurface warfare capability. For those combatants which cannot handle the new SH-60s (LAMPS MK III), Naval Aviators will continue to fly the SH-2F (LAMPS MK I), that carries both active and passive sonobuoys, processes acoustic data through relay with its parent ship, and provides radar and ESM targeting for surface-to-surface missiles. An upgrade program is planned to incorporate mission equipment improvements to meet the threat.

The SH-60B *Seahawk* is the airborne subsystem of the LAMPS MK III system scheduled for FFG-7, DD-963, DDG-993 and CG-47 class ships. The total MK III system includes the SH-60B, the ship's electronics, a helicopter landing system, and helicopter support facilities. LAMPS MK III is a computer-integrated, ship/helicopter combat system that greatly increases the flexibility, combat range and effectiveness of surface combatants. The SH-60B passes sonobuoy information through an advanced secure data link to the LAMPS MK III ship for processing. In addition, the SH-60B has full on board processing capability. Electronic support measures data, radar data, and voice communications can also be passed on the data link.

Both LAMPS MK I and MK III systems can attack using ASW homing torpedoes. Some *Seahawks* will employ *Penguin* air-to-surface missiles to enhance our surface combatants war at sea capability. LAMPS ships and aircraft are needed to protect battle, replenishment and amphibious groups, and escort convoys.

The SH-2F inventory is currently 106 with 19 on order.

The SH-60B inventory is 44 with 45 on order.

**SH-60F** — In 1984, Naval Aviation conducted a competition to select a carrier inner-zone ASW helicopter, and the SH-60F was chosen to replace the aging SH-3H aircraft. A development contract was signed in February 1985 which provides a fixed price for development and production options for the first five lots of aircraft. Two SH-60Bs are being modified into SH-60Fs for test and evaluation of the weapons system. The SH-60F will employ the AQS-13F active dipping sonar and sonobuoys to detect and track submarines, and will be capable of attack using ASW homing torpedoes. Seven SH-60Fs are on order for 1987.

**CH/MH-53E Super Stallion** — The CH-53E *Super Stallion* is a three-engine helicopter designed to lift 16 tons. It is a shipboard-compatible, heavy-transport helicopter configured for both Marine and Navy missions. Marine missions include amphibious assault (providing for lift and movement of cargo and troops), and heavy-lift shore operations (including tactical recovery of downed or damaged aircraft and equipment.)

Navy missions for the MH-53E variant will include airborne mine countermeasures (AMCM) and vertical on board delivery (VOD).

The first two MH-53Es were procured in 1985. The MH-53E will have significantly enhanced AMCM capability over the presently deployed RH-53D. AMCM associated improvements will also enhance the aircraft's ability to perform utility and special missions by significantly increasing range and navigation capability.

The CH-53E inventory is currently 78 with 14 on order.

**AH-1T Sea Cobra** — The AH-1T is a two-place (pilot and gunner/copilot) attack helicopter designed and built to provide the high speed and maneuverability required for the attack mission. Maximum takeoff weight is 14,750 pounds. The armament on the AH-1T includes the *Sidewinder*, *Sidewind* and the tube-launched, optically-tracked, wire-guided (TOW) missile systems, a chin-mounted 20mm turret gun, and a wide variety of forward-firing and droppable external stores. The *Hellfire* missile system will be incorporated in the *Sea Cobra* this year.

The AH-1T is a helicopter gunship whose mission is en route escort and protection of troop assault helicopters, landing zone preparation immediately prior to the arrival of assault helicopters, landing zone fire suppression during the assault phase, and fire support during ground escort operations. With the incorporation of the TOW and *Hellfire* missile systems, the AH-1T has been assigned the additional mission of enemy armor destruction, which requires operation both at sea level and in a high/hot environment.

Currently the inventory of AH-1Ts is 46 with 22 on order.

**V-22A Osprey** — The V-22A *Osprey* (originally the JVX) program was given the go-ahead for full-scale production in May 1985, following a successful 23-month preliminary design effort. The joint nature of the program remains solidly intact with active participation in the development phase by the Navy, Marine Corps and Air Force, with the Army joining in the procurement phase for total program acquisition of 913.

The V-22A will be a vertical-lift tilt-rotor aircraft using advanced, but mature, technology to provide the U.S. military services with a self-deployable (2,100-nautical-mile nonrefueling range), multimission capability for the 1990s and into the 21st century.

The *Osprey's* weapons system will be capable of satisfying varied operational requirements: Marine Corps vertical assault lift, Navy combat search and rescue, Air Force special operations, and Army cargo/utility operations.

There were no procurement funds for the V-22A in FY 86. There were no procurement funds for the V-22A in FY 86.

**T-45 Training System (formerly VTXTS)** — An important ingredient in the continued success of the Navy's tactical forces is the modernization of the aircraft used to train tactical Naval Aviators of the future. The T-45A *Goshawk* meets this critical need. The *Goshawk* will be used by the Chief of Naval Air Training to replace the T-2C *Buckeye* and TA-4J *Skyhawk* in the intermediate and advanced phases of Navy jet training. The integrated system of aircraft, simulators and academics is being built around the following requirements: an initial operating capability to reduce the impact of shortfalls in training aircraft inventories; a procurement schedule which is executable; and an APN funding profile which is affordable. The full-scale engineering development phase has been initiated under a firm fixed-price contract.

The *Goshawk* is a derivative of the proven British *Hawk*. This

aircraft training system will be designed to produce 600 pilots each year at a significantly reduced cost.

It will have 32 simulators, including 22 with visual presentation; an academics package which contains computer-aided instruction; a training integration system to track students and facilitate scheduling; and a contractor-supported integrated logistic system.

The *Goshawk* is scheduled to make its first flight in December 1987. The IOC is scheduled for NAS Kingsville, Texas, in FY 90, followed by introduction at NAS Meridian, Miss., and NAS Chase Field, Texas.

**Adversary Aircraft** — The Navy has a requirement for 49 supersonic adversary aircraft to provide realistic air combat training to Navy and Marine tactical air crews. Congress appropriated funds in FY 84 to procure four adversary aircraft and in FY 85 10 more were ordered.

The Navy adversary version of the F-16 will be procured strictly as an air combat training aircraft. It will utilize the radar and electronic warfare suite of the F-16A and will not have a gun system.

The Israeli C-1 *Kfir* is already being used as a supersonic adversary aircraft. The *Kfirs*, which joined the adversary fleet of F-5s, A-4s, T-38s and T-2s last year, are being flown by Fighter Squadron 43 at NAS Oceana, Va. An additional squadron of *Kfirs* is scheduled for the West Coast this year.

The Navy plans to have 26 F-16s, 12 *Kfirs* and 11 F-5s in its adversary aircraft inventory by the end of the decade.

In addition to these aircraft, Naval Aviation is in the process of procuring the UC-12B transport for logistics purposes; the C-2A for rapid carrier on board delivery missions; the VH-60 helicopter for White House use; the E-6A for future aircraft strategic communication requirements; and the T-34C for training purposes.

To be effective, Naval Aviation aircraft must be young and vital.

In FY 73, at the end of the Vietnam conflict, the average age of Navy aircraft was 8.3 years. Today, the average age of Naval Aviation aircraft is 12.6 years compared with 10 for the Soviet Union. Two thirds of the Navy's aircraft are over 10 years old and more than 50 percent are over 15.

I hope that the procurement program for newer aircraft outlined for this year will bring youth and strength to Naval Aviation. Such attributes are essential as we approach the unknown threats of the 21st century. ■

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VAdm. Edward H. Martin, who hails from Savannah, Ga., was designated a Naval Aviator in 1955. He served as Operations Officer and Executive Officer for VA-34 before his A-4 Skyhawk was shot down in August 1967 near Hanoi, North Vietnam. He was captured by the enemy and held for 68 months as a prisoner of war, being repatriated on March 4, 1973.

Since Vietnam, VAdm. Martin has been C.O. of Canisteo (AO 99), C.O. of Saratoga (CV 60), and Chief of Naval Air Training. VAdm. Martin became Deputy Chief of Naval Operations (Air Warfare) in February 1985, and has the responsibility for establishing policy for the conduct of naval air warfare and determining plans and requirements for naval aircraft, air weapons systems, aircraft carriers, and specified aviation type ships. VAdm. Martin is the principal advisor to the Chief of Naval Operations for all matters involving Naval Aviation.

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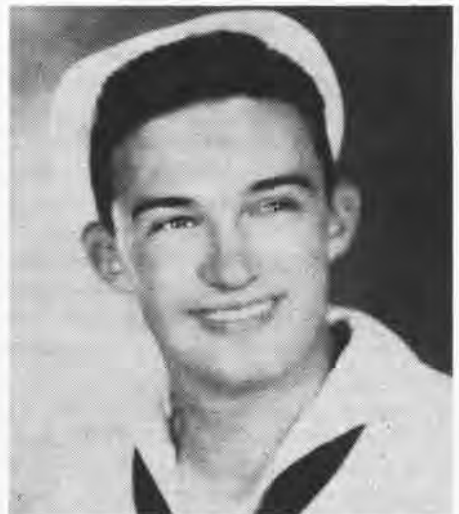


His vast knowledge of Naval Aviation made him an invaluable asset to the staff. *NANews'* editor, Commander Howard Wheeler, recently called him the magazine's "security blanket." Managing editor Sandy Russell, said, "We panic when we think Hal won't be able to see the layout before press. No matter how many times we read the copy, Hal's eagle eye can usually catch an overlooked detail. She added, "We feel that we've passed a difficult exam when he can't find any mistakes."

In every issue of *NANews*, Hal astounds the staff with his ability to recall dates and aircraft statistics, which is indicative of his extraordinary knowledge. When staff members challenge him on a fact, he's rarely wrong.

The man behind this brilliant mind doesn't fit the stereotype image of a fact-chasing, slide rule-pushing, technical brainworker. Hal is soft-spoken but not a pushover. His pleasant facial expression and demeanor befit this all-around nice guy that is well liked by coworkers.

A voracious reader, literally every room in his house has a wall filled with books.



Above left, Hal at *NANews'* layout board and, above, as a young sailor in 1944.

But he's not a typical "egghead" who buries himself in the printed word or is only able to communicate with other technical types. He's also a "people person" who takes an interest in his associates at all levels. A down-to-earth guy, Hal doesn't try to "snow" people with his intellect. He saves the technical lingo for conversations with peers.

All of these qualities add up to a unique individual who has made a lasting impression on the technical world of Naval Aviation.

## HAL ANDREWS

# NAVAL AVIATION'S ANSWERMAN

When Hal Andrews retires in January, after 30 years of civilian service with the Navy, the Naval Air Systems Command's (NavAirSysCom) stock of superior managers will be down one, and Naval Aviation will be minus its technical "answerman."

As the Associate and subsequently Technical Director under the Assistant Commander for Research and Technology, Mr. Andrews has had the major responsibility for NavAirSysCom's advanced systems and technology efforts since 1980. But he has worked for NavAir in some technical capacity since the systems command was established in May 1966.

His expertise in Naval Aviation technology led to a professional association with *Naval Aviation News (NANews)* that has endured since the late 1950s. When he was a young engineer in the Bureau of Aeronautics, he telephoned *NANews'* editorial office one day to point out a misidentified aircraft in a caption of the current issue. It turned

out that Hal was correct. In the next issue, he again pointed out an error in the description of an aircraft. Since the magazine's staff prided themselves on accuracy, they were both chagrined and thankful for the engineer's comments. But when he phoned a third time, the editor said, "Look, why don't you save us both the trouble. Could you come over here and look at all the material before we go to press?" Hal agreed, and he's been doing it ever since.

It wasn't long before this gifted aviation buff was writing articles for *NANews* and was asked to join the staff as a contributing editor and technical advisor, nonsalaried, of course. His name first appeared on the magazine's masthead in the April 1960 issue.

In the midst of his busy career, he managed to find time, usually during his lunch hour, to travel to *NANews'* office and read the final layout pages of the magazine for technical accuracy before press deadline. He also made astute editorial suggestions.



Hal's interest in "machines of all kinds" led him to model building as a youngster in Ithaca, N.Y. In later years, his budding engineer's instincts and enthusiasm for aviation steered him toward Naval Aviation.

During WW II, he interrupted his college education to volunteer for the draft, choosing the Navy because it had an electronics training program. At war's end, after service as an aviation electronics technician (AT), he was discharged. He went home and joined the Naval Reserve. Returning to Cornell University in his hometown, he graduated with a bachelor's degree in mechanical engineering in 1948.

He went to work as a design engineer with the Boeing Aircraft Company in Seattle, Wash. He said that, although he has an affinity toward Navy planes, he thinks the Air Force B-47 bomber is one of the best-looking planes ever built.

While he gained valuable experience at Boeing, he also drilled as a reservist with a local unit, taking courses to change his rating to aviation mechanic in order to qualify for the engineering officer program. Before he could accomplish this, his reserve unit was activated in 1950 for duty in the Korean conflict.

After release from the service in 1951, he moved back east with his family and took a job with the Cornell Aeronautical Lab in Buffalo, N.Y. A year later, he returned to his alma mater to graduate school in aeronautical engineering.

The combination of his Navy experience and his training in aeronautics made him a natural for a position in the field of Naval Aviation. He took a job as an engineer in the Bureau of

Aeronautics (BuAer), which became the Bureau of Weapons (BuWeps) in 1959, and NavAirSysCom in 1966.

Hal recalled his early days as a flying qualities engineer on such aircraft as the Grumman F11F and McDonnell F4H-1 as "a lot of fun" because of the intimate involvement in flight and wind tunnel testing and the entire spectrum of aircraft development. He said there have been many interesting projects in management, but his early years spent working personally with the class desk, getting the aircraft into the fleet and fixing them when things went wrong was "a very satisfying time."

Part of the satisfaction he has derived from his career comes from his working relationships. Hal cited some examples of people who influenced his career, naming only a few. George Spangenberg, the senior engineer in BuAer/BuWeps was a role model for him and other engineers of the day. Captain Walter Diehl, a well-known aerodynamics expert who wrote textbooks in the thirties, Hal called a father figure. He considered former supervisor Bill Koven to be his mentor as he came up through the ranks in NavAir.

"One of the pleasant aspects of working as a civilian for the Navy in its dual military-civilian system is the relationship that you have with military personnel," Hal remarked. "I developed associations working with people on the same aircraft programs that have lasted to this day. All of the top-notch people made it easy to come to work."

When asked if he ever wanted to be in the cockpit rather than on the engineering side of aviation, Hal

remarked that he enjoys flying but would rather let a competent pilot have the controls. He said he didn't go to NASA to get involved in the space program in the early days with many other engineers, because he wanted to stay with airplanes and be able to sample the product.

Hal summed up his 30 years of civilian service as "very rewarding." He added, "I probably ended up doing things quite differently than I expected, because I'm really a technologist now rather than an aeronautical engineer.... The extent to which we in NavAir and its predecessor organizations were given the challenge and opportunity to make a contribution created a unique environment in which to work. You made the job. Within the context of what had to be done, you carved it out any way you wanted, and that's great."

In retirement, Hal will spend more time with his wife of 36 years, Ellen, and enjoy visiting with his three children: Christopher, 32; Timothy, 29; and Betsy, 26. With his demanding jobs over the years, which included a lot of traveling, he feels his family life got the short end of the stick. "I'm very happy that Ellen stuck with me through it all," he said.

Besides the "Naval Aircraft" series of over 70 articles that Hal published regularly in *NANews* since September 1973, he also contributed to U.S. Naval Institute *Proceedings*, Grumman's *Horizons* and *Aeroplane Monthly*, a British publication.

Upon retirement, he plans to actively pursue his historical aviation interests. "I want to finish some of the articles that have been partially written since the early sixties," Hal said. He would like to submit his stories to publications such as the American Aviation Historical Society's *Journal*, *Air Enthusiast* in England, and other aviation enthusiast magazines. He expects to spend time doing research in the Naval Aviation History Office (colocated with *NANews*) and, he added, "if you at *NANews* will have me, I'd love to continue contributing to the magazine."

There is no doubt that *NANews* wants Hal to remain on board as its "answerman." His sharp eye for technical details and glib editorial comments have helped *NANews* maintain its reputation for technical accuracy and well-written text for over 25 of its 67 years of publication.

For his contributions, the magazine staff extends to Hal its sincere gratitude, and looks forward to an association that will continue for many years. ■



Hal (in helmet) checks out the TF-8A at Vought in Dallas in April 1964.

By Hal Andrews

# BF2C-1

**B**ack in the late 1920s and early 1930s, one of the best-known fighters in the U.S. was the Curtiss *Hawk*. It was used in many versions by the Army, Navy and a number of foreign countries. Retaining its biplane tapered wings and typical vertical tail shape in almost every version, the *Hawk* otherwise went through many configurational and structural changes to keep up with technical progress in aviation.

With that background, it is surprising that the last Navy production version, the BF2C-1, was less than a success. A subsequent export version, the *Hawk III*, which reverted from the BF2C-1's all-metal wing internal structure to the prior *Hawk* wood construction, was again a successful design.

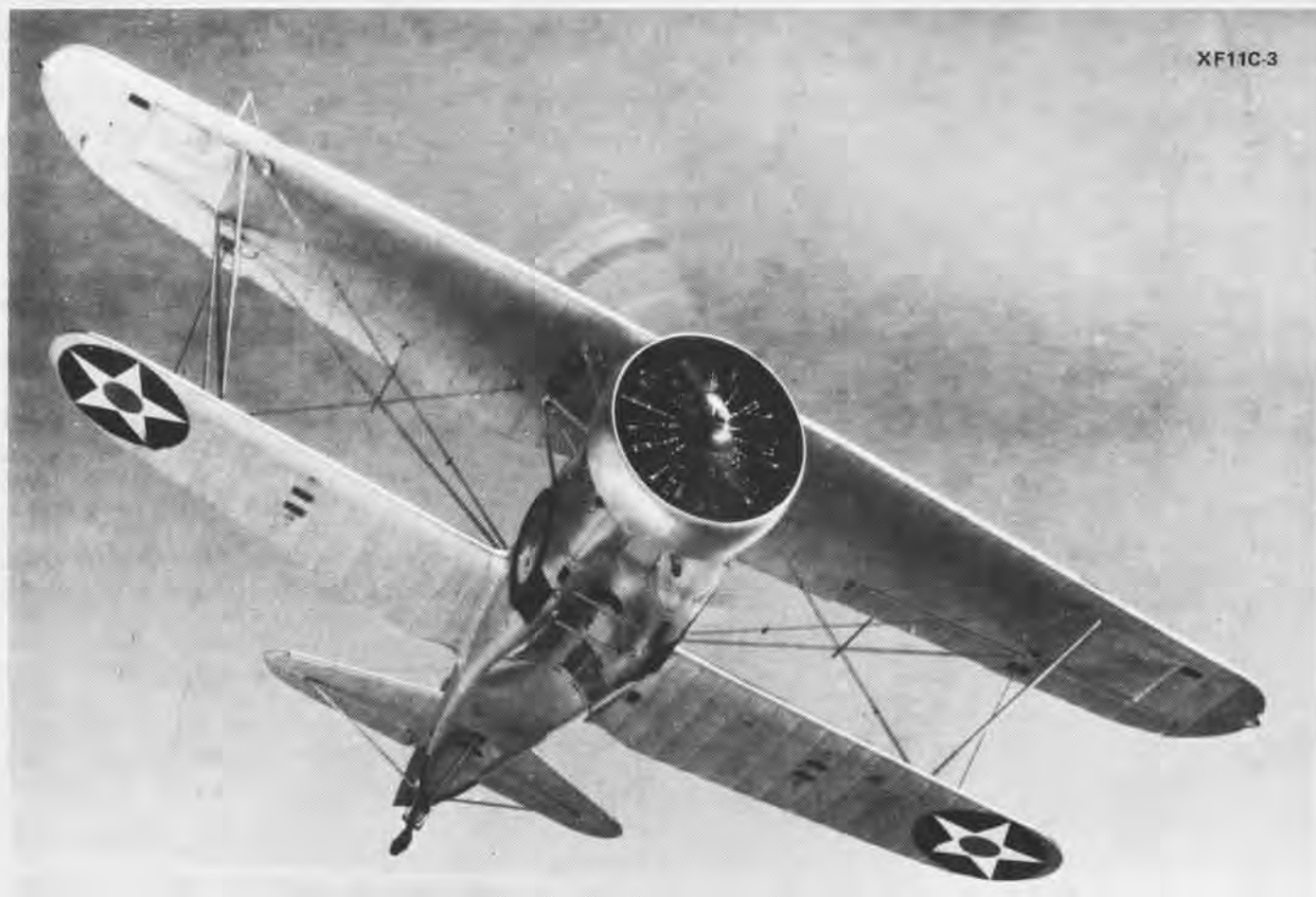
The BF2C-1 story begins with the Curtiss F11C-2 *Goshawk* (a name recently revived for the U.S. Navy version of the British Aerospace *Hawk* jet

trainer). The F11C-2 was ordered late in 1932 as an updated, carrier-based fighter-bomber *Hawk* powered by the latest Wright Cyclone engine. At this time, there was a great deal of interest in improved aircraft design features, including retractable landing gears and all-metal construction. A contract was given to Curtiss to modify one of the F11C-2s to incorporate a retractable gear that pulled the wheels up into the side of the fuselage, similar to their position on the Grumman FF-1 (see *NANews*, March 1979). A 10-percent increase in maximum speed was expected. The gear was operated by a hand crank.

While the 27 fixed-gear *Goshawks* were being completed and delivered to the Navy in the early spring of 1933, modifications proceeded to convert the fifth F11C-2 into the XF11C-3 with an updated version of the Cyclone, the retractable gear, and increased internal

fuel (and oil) tank capacity. The retracted wheels were housed in faired sections extending down from each side of the fuselage, allowing a bomb or external fuel tank to be carried between the fairings. This differed from the Grumman arrangement in which the entire lower fuselage section was extended. The actual landing gear and retracting mechanism were also a different design.

In May, the XF11C-3 was flown to Anacostia for Navy tests at the end of the month, returning to Curtiss for extensive changes in early July. One of the major changes was the replacement of the wood structure wings by similar ones of all-metal structure. The aft fuselage turtleback was also rebuilt and a sliding partial cockpit enclosure incorporated. Other changes were introduced to correct discrepancies uncovered in the Navy tests. A controllable-pitch propeller was also installed (these were just



XF11C-3

BF2C-1



coming into wide use at the time).

The revised XF11C-3 was back at Anacostia in September and a month of Navy testing there and at Dahlgren and Hampton Roads, Va., indicated that its



performance as a dive-bomber met expectations and justified operational tests. With some adjustments at Curtiss' Buffalo, N.Y. plant in October, the XF11C-3 was ferried to San Diego for operations on USS *Saratoga*. These came to an end with a barrier crash in November and the airplane was shipped back to Buffalo for repair.

On the basis of the tests completed, the takeoff run was considered overly long for carrier operations, even with the controllable-pitch propeller. There was also concern over the tail vibration experienced in high-speed dives when carrying either a 500-pound bomb or the auxiliary fuel tank under the fuselage. But overall, the XF11C-3 was generally considered to offer promise as the first Navy dive-bomber capable of maximum speeds over 200 miles per hour. Twenty-seven were ordered, which included the typical 18 for one squadron plus 50 percent spares.

Recognizing the aircrafts' primary mission as dive-bombers, they were designated BF2C-1s and the XF11C-3 was redesignated XBF2C-1 accordingly. An updated R-1820-04 Cyclone was to be

incorporated in the production airplanes, and the XBF2C-1 was modified to test the new engine installation. Flight tests using a standard *Hawk* in the spring of 1934 evolved an inverted semi-ring airfoil section extending below the lower fuselage fairings which eliminated the tail vibration in dives. With these and other planned production changes, the XBF2C-1 was back in the air in July 1934, going to Anacostia at the end of the month, and after brief trials on to Norfolk for accelerated service trials in August.

Production BF2C-1s weren't far behind. While the XBF2C-1 crashed after an engine failure in September, the first production BF2C was at Anacostia for its trials only a short time later.

Early in November, VB-5B took delivery of its 18 new BF2C-1s, the "spares" going into the Battle Force pool at Norfolk. Squadron training carried over into the new year and, in March, the C.O., Lieutenant Commander J. D. Barner, was ready to take the squadron aboard its assigned carrier, *Ranger*.

The initial operations brought a new surprise: three airplanes in quick succession ended up in barrier crashes, wiping out their landing gears along with other damage — though without any serious injuries. A previously unexperienced hook bounce was diagnosed as the cause, and subsequent carrier operations proceeded normally.

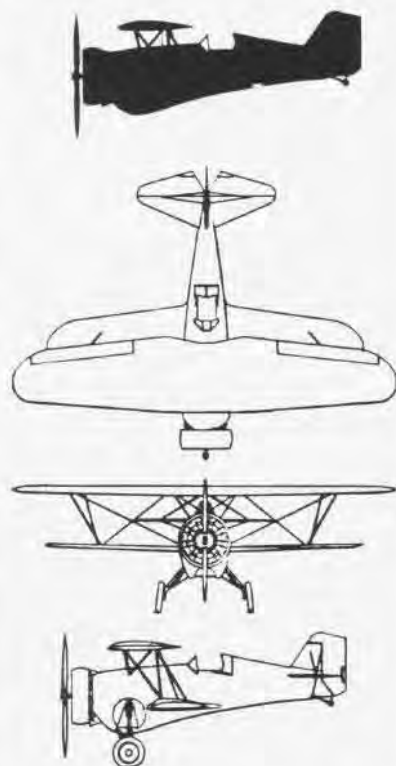
*Ranger* carried the squadron, and the pool airplanes, through the Panama Canal and to its new base in San Diego, arriving in June. Settling down for a typical squadron tour, the only real concern with their airplanes was a problem with the wing rigging, which was sometimes found loose after dive-bombing flights.

In September, a squadron pilot was killed in a dive-bombing flight, diving into

the ocean after structural failure. The accident led to withdrawal of the airplanes from squadron operations — all but one being withdrawn by the end of their first year in service. Individual aircraft were flown back to the Naval Aircraft Factory in Philadelphia, and to Curtiss for structural tests and examination. However, no further modifications were made and the BF2C-1s were surveyed in early 1937.

In the meantime, Curtiss put the wood structure wings and other improvements on the otherwise similar *Hawk III* non-carrier export version. It continued to be built for several foreign countries as late as 1938. By this time, the monoplane had taken over. While there were subsequent prototypes, Curtiss never produced another single-seat fighter or fighter-bomber for the Navy.

BF2C-1



Length:	23'
Height:	10'10"
Span:	31'6"
Gross Weight:	5,086 lbs.
Maximum Speed:	225 mph
Service Ceiling:	27,000 ft.
Maximum Range:	797 mi.
Engine:	Wright R-1820-04 700 hp
Armament:	One .50 and one .30 or two .30 guns; one 474-lb. or four 116-lb. bombs
Crew:	One

## P-3C Orion:

# Durable Plane, Demanding Mission

By JO2 Timothy J. Christmann

It is ironic that the Department of Defense, which bristles with the most modern military equipment, uses one of its oldest design aircraft for maintaining daily contact with the "enemy."

"The Army and Air Force train against fake targets representing simulated enemies and missions, but the P-3 *Orion* tracks actual Soviet submarines worldwide every day," said Captain C. T. "Skip" Moyer III, program coordinator for the P-3 Program in the Office of the Chief of Naval Operations (OPNAV), Washington, D.C. "Because of this direct contact with our adversary, we obtain a very high level of readiness, have a good measure of effectiveness, and develop confidence if we ever have to go to war."

The Lockheed P-3C, which entered the fleet 16 years ago as a follow-on to the P-3A and P-3B, is the Navy's only long-range, four-engine turboprop aircraft that helps protect the carrier battle group from enemy submarines. The P-3C shares the antisubmarine warfare mission with other Navy aircraft, including the S-3 *Viking*, SH-2F *Seasprite*, SH-3H *Sea King* and SH-60B *Seahawk*. The *Seasprite*, *Sea King*, and *Seahawk* scan the area closest to the

battle group (within 100 miles), the S-3 covers the middle territory (inside 200 miles) and the P-3 surveys furthest from the battle group (beyond 200 miles).

"The P-3C plays an important role in protecting the battle group," said Capt. Moyer. "The battle group's ability to move into the forward areas required by maritime strategy will depend a great deal on the degree the submarine threat is decreased."

Over the past decade the *Orion's* on board computer and acoustic sensors have been "updated" (I, II, II.5, and III) to better detect the continuing sophistication and quietness of the Soviet underwater fleet.

How does the detection process work?

Typically, a P-3, which normally carries a 12-man crew, will fly to a designated area on any of the world's large bodies of water and drop sonobuoys. The *Orion* can carry more than 80 of the cylindrical objects which are about three feet long, six inches in diameter, and weigh 30 to

50 pounds. Once deployed the sonobuoys, which are dropped in patterns along the ocean's surface, lower small highly sensitive hydrophones (or sensors) which listen for sounds emitted from submarines. If a sub is detected, the information will be relayed back to the P-3 where its sophisticated acoustic sensor suite analyzes such crucial data as the submarine's type, bearing and range.

In peacetime, the P-3C crew will alert the carrier battle group and antisubmarine warfare centers ashore once detection is made. Meanwhile, it will continue to monitor the submarine until another P-3 relieves it. In wartime, however, the *Orion* would show its teeth and use an assortment of weapons to destroy the enemy. Able to carry more than 14,000 pounds of ordnance, the P-3 can employ mines, torpedoes and depth charges to terminate an underwater foe.



And, since 1979, it has been configured to carry the long-range (60-plus mile), antiship *Harpoon* missile.

"The VP missions are extremely challenging," said Capt. Moyer, a P-3 driver with more than 5,500 hours. "They change flight to flight because of the varying parameters of targets, oceanic and weather conditions, surface and air threats, etc. In addition, the aircraft itself is a joy to fly. It is perfectly suited for the mission, has been able to accommodate avionics developments over the past 20 years, and has an outstanding safety record."

Although the P-3C's primary mission is ASW, Moyer said the plane is capable of other missions, such as mining operations, over-the-horizon-targeting, surface surveillance, and direct submarine support.

"The combination of the aircraft and the challenging mission helps keep people in the VP business," added Moyer, who was C.O. of VPs 16 and 31. "The mission is particularly stimulating to young pilots and NFOs who can see direct results of their skills against the targets they are going to be hunting in war. There's nothing like the thrill of...going out and actually tracking Soviet submarines."

### Detection Capability

"Our success ratio for detecting and tracking subs is very high," said Commander Vance Adler, Assistant Program Manager for Systems and Engineering for P-3 Derivatives at the Naval Air Systems Command (NavAirSysCom), in Washington, D.C. "I can't give specific numbers, but we do have a much higher success rate with the P-3C than we had tracking subs with the P-3B."

Adler, a P-3 pilot with 4,500 flight hours, added that U.S. submarines are quieter than foreign submarines but that foreign subs are getting "quieter all the time." Because of this, the U.S. Navy is continually modernizing the P-3's sonobuoys, on board sensors, and tactics.

Adler attributes the P-3's success and longevity to its sturdy airframe and on board sensor package. The active-duty Navy is currently using a variety of onboard sensor packages including Nonupdate (1969), Update I (1975), Update II (1977), Update II.5 (1981), and Update III (1984). The major difference between the original Nonupdate and its successors is the dramatic increase in

the ability to process information relayed to the P-3 by its deployed sonobuoys. However, the most advanced improvement is Update IV, which is scheduled to hit the fleet in the early 1990s.

"[Update IV] is probably two to two and a half times more capable than Update III, and eight to 10 times better than Update II," said Capt. Moyer.

Added Cdr. Adler, "Update IV will have a more modern acoustics processor and satellite communication capability...but what's revolutionary is its architecture. Instead of having one large central computer on board [like its former updates have], IV will be a series of smaller computers linked via data bus."

### USSR P-3 Counterpart

The Soviet Union uses the turboprop Ilyushin IL-38 *May*, an aircraft that looks almost identical to the P-3, to perform long-range ASW operations. But physical appearance is where the similarities end. The *May* lacks the P-3C's speed, endurance (12 hours vs. 16), sub-hunting capabilities, and diverse weapons inventory. In addition the *May*, which was put into service in 1969, usually restricts its irregular ASW operations to the North Atlantic and Mediterranean — unlike the 39 active and reserve P-3 squadrons which continually cover all major bodies of water worldwide.

"As far as we can tell, the Soviets are attempting to [perform] the same job with the *May* that we do with the P-3, but they can't do it nearly as well," said Capt. Moyer. "They are concerned with ASW, but not to the same degree as the U.S."



JOCS Kirby Harrison

Navy. [We] made the decision a long time ago that ASW was a very important part of defending the seas and keeping the fleet safe."

Moyer added that the Soviets have evolved slowly in ASW, but are quickly making up for lost time by modifying many of their ships and aircraft (particularly helicopters) to perform the sub-detecting role.

### P-3 Vulnerabilities

It isn't easy finding the enemy in all the seas and oceans of the world, and P-3C crews know that sub-hunting in the calm, deep North Atlantic Ocean beats scanning the unsettled, shallow Mediterranean Sea. However, most realize that the technology the P-3 currently incorporates is the best in the world for handling the job. Even now, many months before Update IV is loaded into P-3 airframes, Updates II, II.5, and III are enhancing the survivability of the carrier battle group by detecting subs at a pace potential enemies must envy.

What adversaries probably don't envy are the P-3's vulnerabilities. In war the P-3, due to its 200 to 400-knot speeds, would be easy prey for enemy fighters and surface-to-air missiles.

Today's technology can provide the *Orion* with air-to-air missiles or an effective cannon that could destroy Soviet jets, but the aircraft can't afford the extra weight or the extra mission. Besides, the P-3 doesn't have the maneuvering capability to fire air-to-air missiles.

"The P-3 isn't a bomber or an attack aircraft," said Cdr. Adler, "so the platform really doesn't lend itself to the air-to-air mission."

Instead of being armed to deal with air threats, the P-3 crew depends on other air and surface assets to alert them before a hostile aircraft gets too close.

"Hopefully, in war, we would have some fighter support to take the enemy planes out," said Cdr. Adler. "Right now we don't have anything to defend ourselves. We can fly in the clouds, fly down low, go slow...but really we're sitting ducks."

Capt. Moyer remarked that in most cases the P-3 operates too far away from U.S. carrier battle groups to receive timely assistance from F-14 *Tomcats* or F/A-18 *Hornets*.

A major threat to the P-3 is not land-based Soviet fighter planes as much as the VTOL Yak-36 *Forger* which operates

off Russia's small-deck (37,000-ton) carriers *Minsk*, *Kiev*, and *Novorossiysk*. Although vastly inferior to Navy tactical fighters, the *Forger* has the speed (over 800 knots) to catch the P-3 and the firepower (23mm cannon and heat-seeking missiles) to shoot it down.

For years, P-3s could operate without worrying about the threat of Soviet fighters, but it seems the Soviets plan to increase their tactical aviation capability. A major development is the construction of their first large-deck (65,000-plus-ton) catapult-equipped nuclear aircraft carrier, presumably called *Kremlin* (see "Soviet Carrier Construction Continues," *NA News*, November-December 1985). Unlike *Kiev*-class carriers, which could only carry 12 to 14 *Forgers*, *Kremlin* will be able to haul 30 to 60 more modern fighter aircraft. Said Capt. Moyer, "It will be a definite threat."

Before *Kremlin* comes to fruition around 1990, however, the P-3's vulnerabilities may be reduced considerably. Among the many improvements currently being evaluated for the P-3 is a survivability package that will give the plane better air-to-air detection capability, electronic jamming equipment, and other devices used to render incoming missiles ineffective.

### Harpoon

The addition of the radar-guided *Harpoon* missile to the P-3's weapons inventory has given the plane the capability to sink ships some 60 miles away. But this doesn't mean the P-3 is going to be ordered to attack Soviet *Kirov* cruisers or *Sovremenny* destroyers on the open ocean. Although the *Harpoon's* 97-percent reliability rate enhances the P-3's ability to carry out such a mission, its crew would probably be directed to destroy less fortified adversaries — like trawlers.

According to Cdr. Adler, the sound of a Soviet trawler engine is similar to a submarine's. And, in war, this vessel would not only be equipped with various radars and communication devices, but with surface-to-air missiles.

"If a trawler is sailing in an area a P-3 is trying to search, you need a weapon to take it out," said Adler. "*Harpoon* is that weapon."

He added that in most cases, due to the *Harpoon's* over-the-horizon targeting capability and lethal hull-snapping, 570-pound warhead, the trawler's inhabitants wouldn't know what hit

them.

"[The *Harpoon*] certainly gives another asset to the battle force commander," said Moyer, adding that the only drawback in hanging up to six *Harpoons* on a P-3's wing is that it reduces the aircraft's range.

### All P-3C Active Force

According to Capt. Moyer, the active-duty VP squadrons will all be flying P-3Cs by 1989. But this optimistic goal can only be achieved if the P-3 production line stays open and the Navy continues to receive five to nine *Oriens* each year.

Three VP squadrons in Hawaii continue to fly the P-3B TACNAVMOD, which is an updated version of the P-3B. The TACNAVMOD variety has more advanced navigation and a bigger acoustic processing package.

"One of the ways to help solve our P-3C shortage in the active Navy and help meet our 1989 goal is to utilize some P-3Cs currently being flown by our two fleet readiness squadrons, VPs 30 and 31," said Adler, who has been assigned to NavAirSysCom for three years. He added that a certain number of P-3Cs at the FRSs are being used "strictly for pilot training." To remedy this situation, NavAirSysCom plans to replace some P-3Cs used for this purpose with specially modified P-3As (called TP-3As).

"We want to take the P-3As and basically remove the ASW equipment and replace the cockpit with an upgraded P-3C cockpit equipped with Update II.5 avionics," he said. "We are planning to provide the FRSs these TP-3As [for their P-3Cs] beginning this year. The prototype was delivered in December and we'll probably have the first production aircraft delivered by May 1986."

According to Adler, approximately one TP-3A will be delivered to VP 30 or 31 each month for 12 months. "So each FRS will have six of these aircraft for the pilot training mission," he said. "Therefore, they don't have to take a P-3C Update II or Update III and slam it on the runway all day long. They can save that for the tactical portion of the syllabus."

The TP-3A will reduce FRS flexibility because it can only be dedicated to the pilot training phase of the syllabus. This presents a minor obstacle for VPs 30 and 31, because they are currently using their P-3Cs in all flying phases.

### Drug Interdiction

Since the P-3 *Orion* is such an effective

platform for long-range surveillance — thanks to its APS-80 radar — the U.S. Customs Service has obtained four of them to interdict drug smugglers.

About two years ago, Congress directed Customs to utilize some P-3As in an effort to reduce the Department of Defense's involvement in the drug interdiction role. The P-3As were equipped with APG-63 air-to-air radar (the same used in F-15 *Eagles*) to enhance its capability of detecting and tracking suspicious air contacts.

"Since the Navy is the only service that has P-3s, we were directed to do a study on several different air-to-air radars to go into the P-3A," said Cdr. Adler. "The APG-63 was the most suitable for radar available for the mission."

In addition to the APG-63 radar, Custom's P-3As have retained a portion of the APS-80's electronics to provide a sizable surface detection footprint.

"Customs will have a total of six aircraft [by the end of 1986] that they will use for flying drug missions," said Capt. Moyer. "But, because the need is so great, CinCLantFlt is being tasked with providing additional aircraft to assist the antidrug effort. These missions are flown by the active and reserve fleet and detract from our antisubmarine warfare capability...."

"Flying drug missions decreases our readiness, uses flight hours, cuts into funding and takes away ASW training time," added Moyer, who has flown drug interdiction flights. "But the mission has been deemed extremely important by the vice president and we respond to that tasking."

The P-3 has "substantially increased" Customs' capability in catching drug smugglers, according to James Mahan, spokesman for Customs in Washington, D.C. In an article titled "Naval Air War on Drugs" (*NA News*, September-October 1985), Mahan said that the first P-3A that Customs acquired from the Navy in 1984 aided in the seizure of 9,000 pounds of marijuana, 900 pounds of cocaine, nine aircraft and 22 arrests. He said recently that the figures for 1985, which have not been tabulated, are much higher.

### P-3C Replacement

According to Capt. Moyer, the P-3 community is currently involved in a major evolution of selecting a replacement for the P-3.

"The airframes we built in the 1960s belong to the reserves and will reach the

end of their service life by the early 1990s," said Moyer. "If given the opportunity to develop a new aircraft, we must give careful consideration to selecting an airframe that can carry us into the future and be able to house Update IV. Needless to say, a great deal of our time, for those of us in the P-3 business at [OPNAV] and NavAirSysCom, is currently being spent on this development."

Moyer added that the new aircraft could be a derivative of an existing commercial airliner like the 757 or MD-80. It could also be a modernized version of the P-3 itself...a P-3 that is longer with larger wings, more weight and better engines to improve fuel consumption and increase the plane's time on station.

"It is too early to speculate," said Moyer. "It could be any aircraft [757, MD-80, E-6, etc.] but we haven't pinned any down because we haven't gone to industry and asked them to make bids and proposals to us yet. That could take place in the spring, perhaps as early as March."

Although he said the decision rests with John F. Lehman, Secretary of the Navy, Moyer added that, in his opinion [commercial aircraft corporations] have as good a chance selling the Navy a new airframe as they do modifying the P-3C.

"It's probably a 50-50 toss-up right now as to what the aircraft is going to look like in the future," he said. "[An entirely new] version would probably be swept-wing and either be jet-powered or

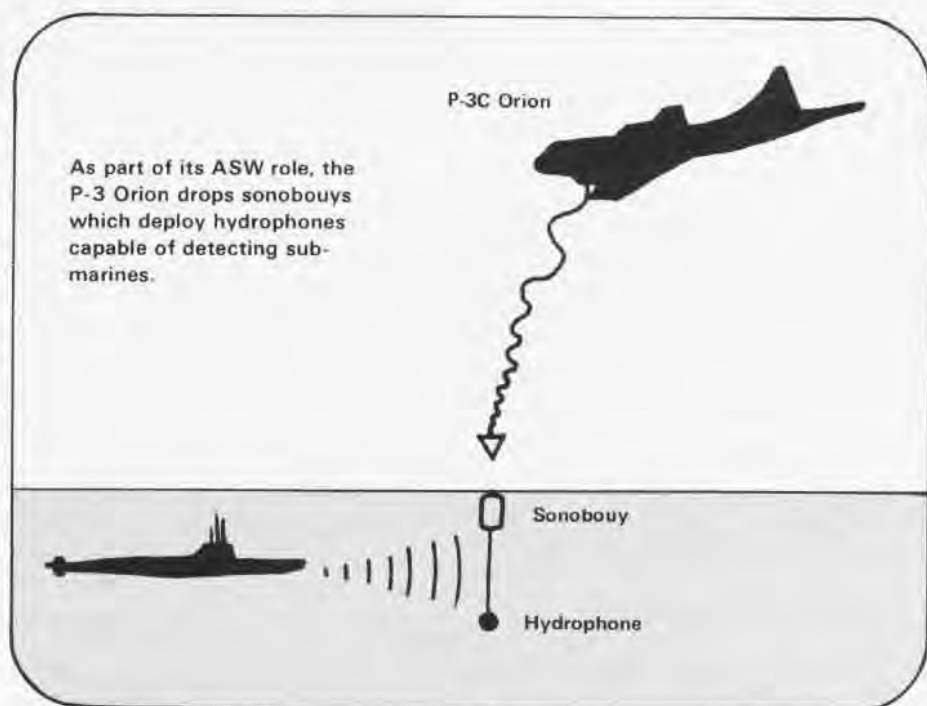
have a new type of power plant, such as the promising unducted fan engines which should be ready for production in the early 1990s."

According to Cdr. Adler, whatever platform is chosen to take on the long-range ASW role, it will definitely receive Update IV, which is a generic package that can be integrated with almost any large airframe (i.e., P-3, E-6, 757, etc.).

As far as Adler's concerned, there isn't another platform available today that can meet the overall VP mission better than the P-3.

"The turboprop engine allows you to fly fairly high (28,000-plus feet) and fairly fast, and yet operate economically at low altitude as well as high altitude, which is all part of the mission," he said. "If the Navy selects a jet turbofan type engine, we could get to an area fast and remain at altitude, but if we have to operate down low — which we do a lot of the time — it is not as efficient. The unducted fan engines that are undergoing testing are supposed to be better in fuel economy, but I'm not sure they will operate as efficiently as the turboprop over the wide operating area the P-3 covers."

Capt. Moyer agreed that despite its age, the P-3 is still a durable airframe, which has yet to be equalled. He realizes, however, that the need for long-range ASW will grow with the increasing threat and capabilities of Soviet submarines, and that a new airframe may be necessary to handle this task beyond the year 2000. ■



# SHARPENING OUR EYES OVER

Last fall, terrorists took control of the Italian cruise liner *Achille Lauro* in the Mediterranean. That forceful act resulted in the tragic death of an American passenger.

After the terrorists abandoned the ship, they attempted to make their escape aboard a chartered EgyptAir 737 passenger jet. Acting on available information, President Ronald Reagan ordered the 737 intercepted and escorted to a base where the offenders could be brought into custody.

A Navy E-2C *Hawkeye* was sent up from USS *Saratoga's* flight deck to locate the terrorists' getaway plane. Sifting through the numerous military and commercial aircraft in that congested airspace, the *Hawkeye's* sophisticated systems were able to pick the 737 out of the crowd. F-14 *Tomcats* were vectored in for the intercept and the rest is history. This headline-making event demonstrated just one of the many capabilities of the *Hawkeye* aircraft.

Military commanders have always had a critical need to know their enemy's strength and direction of attack. Getting this information was once as easy as climbing the tallest tree at the edge of a battlefield or posting lookouts atop castle battlements. The battle zone was measured in hundreds of yards. Forces could move no faster than their horses could run.

Today's battle zone is measured in hundreds of miles, and response time is measured in seconds. Supersonic aircraft and cruise missiles which can skim the earth's surface — undetected by radar until they flash over the horizon — make the need for early warning more critical than ever.

Solution: Flying radar stations that can see in all directions for hundreds of miles and spot any attacker, then direct friendly forces in for the intercept.

With its distinctive rotating radome and 10,000 pounds of electronic equipment, the Grumman E-2C *Hawkeye* is just such a station. Like a hawk, the E-2C has the sharpest eyes in the sky. This model of the all-weather, airborne early warning command and control aircraft began its U.S. Navy fleet service in 1973.



Since the *Hawkeye's* introduction, both Grumman and the Navy have continually upgraded its early warning systems to include the latest electronic technology. To accomplish this task with much greater ease and efficiency, a new E-2C systems engineering and software facility, the largest Department of Defense-authorized facility of its kind, recently went into service at Bethpage, Long Island, N.Y.

The "highly secured," three-story, 70,000-square-foot structure is the center for avionics development for both U.S. and foreign versions of the *Hawkeye*. Computing power throughout the structure is extensive and includes an integrated computer system on the first two floors and three separate computer networks on the third.

The new facility comes at a time when

the Navy is concentrating on several major E-2C programs, including a two-part update development program, the integration of the joint tactical information distribution system (JTIDS), and the development of software systems for E-2Cs purchased by Egypt and Singapore.

"We needed a building that could integrate more than one system," says Captain "Spike" Seligson, the Navy's E-2C/C-2 program manager in the Naval Air Systems Command. "We aimed for interoperability among these various programs' labs. With this capability, we don't tie up valuable aircraft assets during the development stage. The E-2C systems engineering and software facility is just what we wanted."

While the ability to integrate multiple-configuration systems is a key asset of



# THE HORIZON

By Bob Sample



the building, so is the ability to keep foreign military personnel under training separate from people working on Navy programs. "Many of the Navy E-2C systems haven't been released to our foreign customers," explains Seligson.

The first floor houses activities involving fleet requirements, design specification, hardware development, system integration and testing. Also located on the first floor are areas dedicated to radar, instrumentation, JTIDS, passive detection and communications. These areas are interconnected with each other and with computers on the second floor.

The entire second floor is devoted to the development of tactical and support software. Office and lab facilities for foreign E-2 customers are on the third floor. Separate and controlled access

points isolate the third floor from the rest of the building.

There is one entrance to the facility and no person may enter the area without authorization. Once inside, visitors may only enter certain parts of the building, and they are escorted at all times during their stay.

The pervasive concern for security even extends to the building's utility equipment. A separate utilities building is accessed through a corridor outside the E-2C facility, so that utility repair personnel need not enter the main building.

Visitor presentations take place in a visitor containment area that houses a 40-foot by 30-foot theater that can be divided into two equal size conference rooms. A closed-circuit video system makes it possible to view E-2C flight and lab activities in the theater. For instance, a video tape of an actual flight can be replayed for an audience, or real-time action aboard an E-2 flying above Bethpage can be transmitted onto the theater screen. Two cameras, two video cassette recorders and four large-screen television receivers provide displays of E-2C avionic capability and minimize the disturbance of lab activity.

The theater adjoins the E-2C integration area which has one of the six 3+1 benches in the facility. These benches consist of actual E-2C hardware and software that fly aboard the aircraft. When it is necessary for visitors to pass

from the theater to the integration area, development activities are shut down and motorized, sound-proof, light-tight draperies isolate the integration area from other work areas.

"The building also gives us the capability to use live radar during tests," says Seligson. "There is an antenna farm and an E-2C rotodome installed on the roof."

Diagnostic checks of ground support equipment are handled in a garage-like area spacious enough to accommodate large electronic equipment vans — a feature crucial to the JTIDS integration program. During tests, the equipment in the garage area can be connected to E-2C tactical systems, computers and to various antennas.

Most of the building is set up to be easily reconfigured. The floors are actually carpeted squares over a two-foot-deep subfloor that accommodates interconnected system wiring, power cables, cooling ducts and other utility equipment. Most of the furniture is of the modular, open-plan variety. Hallway widths were planned according to the size of the equipment and benches that will move through them.

"The building gives us the capability to integrate the most advanced systems into the present E-2C configuration, says Capt. Seligson. "It also lets us lay the cornerstone for future avionic systems. We're extremely pleased with the way it turned out." ■



Far left, an E-2C Hawkeye. Left, Navy personnel monitor the scopes at a 3+1 bench.

# A Success Story Unfolds

By Commander Jim Jacobsen

In today's fast-paced world, our receptor sensors are bombarded with advertising. The bumper sticker seems to be the latest message sender. There's one\* in Washington, D.C., that reads, "LDO — the only way to fly!"

This message gives us a valuable insight into one of the Navy's new and successful programs — the Limited Duty Officer (LDO) Aviator program. Late in 1979, a board of unrestricted line aviators met to provide the Secretary of the Navy with recommendations for a new program that would give enlisted members an opportunity to earn a commission and a seat in the cockpit of naval aircraft. The primary objectives of this program were to:

- Improve utilization and retention of unrestricted line aviators.
- Provide further upward mobility for qualified enlisted members.
- Increase flight instructor stability in the training command.
- Replace unrestricted line aviators with LDOs in selected billets.

The new LDO Aviator program required graduates to spend an initial tour in the training command as primary flight instructors, thus relieving unrestricted line aviators to fill billets in the fleet. After the initial tour, career-enhancing billets in the fleet would follow.

Flying LDOs (FLDOs) can expect that after the training command, their first sea tour will be on board a carrier in any number of positions, such as hangar deck officer, assistant flight deck officer and aviation fuels officer. Subsequent shore tours might be in another squadron, a training wing, or aboard a naval air station as safety, assistant operations or operations officer. Later sea tours can include assignment aboard carriers, afloat staffs, overseas air stations or with fleet logistics support or fleet composite squadrons.

Since the percentage of people who leave the LDO Aviator program for being

not physically qualified is very low, and until 1985 there were no personnel who dropped on request, the program can be considered an unqualified success. It has paid off for the Navy and its enlisted members. The possibility of selection is, by far, the best of any aviation program in the Navy. The membership represents a cross section of almost all of the ratings in the Navy. Not only are aviation-related ratings represented but others as well, including quartermaster, machinist's mate, corpsman and electronics technician.

According to Commander Tom Pruter, the LDO Aviator detailer in the Naval Military Personnel Command, the "opportunity for selection has never been greater" and "the path to commissioning has never been so attractive."

A good example of opportunity realized is Lieutenant Paul Edmondson, a Flying LDO aboard *Midway* who is assistant officer in charge of the carrier's C-2 detachment embarked from Fleet Logistics Support Squadron 50. As airframes branch officer back in the squadron, he is plenty busy and enjoys every minute of his flying time. Lt. Edmondson finds his job "really rewarding" and says "the flying is great and...the welcome was very warm."

The consensus of FLDOs is that their jobs are what they expected, and sometimes more. With all of the positive feedback from the fleet, it appears that the LDO Aviator program is heading in the right direction. The statistics in Figure 1 bear this out.

Although the FY-86 input to the program is less than desired, there appears to be a trend toward a high completion rate. So, although the

number of applications are down, the program itself is a solid success.

The original precept of creating a viable career progression and accession plan for the LDO Aviator community is working. The original group of 33 FLDOs received their wings during the period January-August 1982. Two additional groups received their wings in 1983 and 1984. When the latest class now at NAS Corpus Christi, Texas, has completed training and received their wings, the community will comprise 67 LDO Aviators.

The original FY-81 class had a 100-percent promotion rate to lieutenant. Their assignments are shown in Figure 2.

Giving enlisted members an opportunity to become Naval Aviators is not a new idea. In 1916, the first enlisted man began flight training at Pensacola, Fla. After flight training, most enlisted aviators retained their enlisted status. More than 3,700 Naval Aviation Pilots (NAPs) were trained in this manner. They participated in virtually all aspects of Naval Aviation, frequently distinguishing themselves in combat.

The last NAP, Master Chief Petty Officer Robert K. Jones, retired on January 31, 1981, after completing 38 years of active duty. The Aviation Cadet Act of 1935 created the NAVCAD program which gave enlisted personnel an opportunity to earn wings and a reserve commission. During WW II, the need for pilots was so great that the requirement for a college degree was ultimately reduced to those highly qualified with high school diplomas. The last NAVCAD to complete flight training was commissioned in 1968.

Today in the fleet, there is a new breed

FY	Applications	Selectees	In Training	In Program
81	111	44	—	33
82	35	16	—	11
83	34	19	—	10
84	47	21	5	8
85	42	17	13	—
86	42	12	—	—

Figure 1

of aviator, the LDO. The first two LDOs to complete the LDO Aviator program were Lieutenants Michael A. Gray and Douglas F. McGowan, Jr. Both are flying C-2s and were recently upgraded to carrier transport aircraft commanders. In a recent communication with his detailer, Lt. Gray said, "Our welcome to VR-24 could not have been better. The entire squadron really treated us well...The X.O. asked for me to pass on [to the detailer] that they can use all of the Flying LDOs you can spare...they want more of us!"

Very often a new program such as the LDO Aviator brings out the best in its members' motivation and performance, which ultimately determine its success or failure.

A story is told about the first two LDOs' eagerness to excel while going through

**Type Command Assigned**

CV	18
CVT	1
VRC	8
LPD	2

**Type Billet Assigned Aboard CV/ CVT/ LPD**

Fuels Officer	3	Asst. CATC	2
Admin Officer	1	Ops. Admin.	2
Asst. Admin.	2	Air Admin.	1
Asst. Hangar	4	GM Test Lnch.	1
Safety Officer	1	Asst. Flt. Dk.	4

Figure 2

the training command. In fact, they were running head to head trying to be the first to solo...the first to... anything. Fortunately, there was a wise wing commander who readily perceived that the rush for the "first" records could develop into a safety problem. He solved it to the satisfaction of both pilots. He allowed them both to solo at the same time, etc., thus preserving their spirit and eagerness.

The first group of LDO Aviators have been proving themselves in the fleet and have shown what motivation can do. Succeeding groups of FLDOs have shown this same spirit. Cdr. Pruter said recently, "There is a certain cohesive spirit or a comradeship that binds these guys together, a spirit which I've not seen for quite some time. For instance, a recent group of FLDOs decided to take their physical fitness training seriously. They ran three miles each morning to be certain that they would be in top shape for the physical rigors of the program."

One of the remarkable aspects of the LDO Aviator program is that this same spirit to excel still pervades its membership, due perhaps to the quality of individuals chosen. A cursory glance at some of the statistics on the program shows that qualified personnel have a good chance of being selected. The percentage increases with aeronautical experience, such as a private pilot's license.

No matter what qualifications a candidate possesses, the most important qualities seem to be desire, motivation and dedication. As a former enlisted man who ultimately went through the Aviation Officer Candidate program, the author speaks from personal experience when he says, "You gotta want it! It's not luck. It's desire!" ■



Lts. Dan A. Chambers (left) and Paul E. Edmondson fly the C-2A with VRC-50, providing carrier on board delivery support to all Indian Ocean and WestPac carrier battle groups.



Lts. Michael A. Gray (left) and Douglas F. McGowan go through the pre-start checklist in a VR-24 C-2A.

**Limited Duty Officer (Aviator)  
Procurement and Appointment Plan**

- Serving in paygrade E-5/6/7
- All ratings eligible (except nuclear power NECs)
- Minimum of 4 years service
- Under 30 years of age
- Completed 60 semesters or 90 quarter hours of college work (equivalent accepted)
- Academic qualification test score of at least 3
- Flight aptitude rating score of at least 5

For current details on the LDO Aviator program, see NAVMILPERSCOMINST 1131.2 of April 1985, the basic instruction SECNAVINST 1120.2, or contact Cdr. Tom Pruter, Naval Military Personnel Command, Code 432L, Washington, D.C. 20370-5432, autovon 224-4178/4596, commercial (202) 694-4178/4596.

Cdr. Jacobsen is a Naval Reservist, a former ADJ2, Naval Flight Officer and presently a public affairs specialist. In civilian life, he's an executive recruiter in Washington, D.C. He holds an ATP rating and is an FAA-certified flight instructor for single, multiengine and instruments, both land and sea. He has over 3,600 hours of pilot-in-command time.

**T**oday, Naval Aviators are much better trained and have a better understanding of the capabilities of their aircraft than my peers and I did some 40 years ago. For us, it was a time of flying by the seat of our pants and discussing ways to be a better pilot among ourselves without the benefit of any standardization, not to mention a NATOPS program.

Let me explain it this way.

When I graduated from flight school at Pensacola in 1936, I was ordered to VF-6, *Saratoga's* fighter squadron, along with a friend and Naval Academy classmate, Ensign Milton "Steve" Stephens.

On arrival, we found the fighter squadron in the midst of the annual training and bombing competition. With only four VF squadrons in the Navy at that time, competition for the "E" awarded yearly by ComAirBatFor for the best squadron in each phase of VF training was keen among personnel from *Saratoga*, *Lexington*, *Ranger* and *Langley*. Since Steve and I arrived late in the bombing season, we felt we had to "get good" in a hurry to catch up with the rest of the pilots and uphold the fine record of VF-6.

The miniature practice bombs we used were supposed to be dropped from a 70-percent dive at 2,000 to 2,200 feet altitude and pullout accomplished by 1,000 feet. If we didn't hit these checkpoints, the drop was disqualified. Done properly, the G forces in the pullout were 5 or 6. The plane was stressed for 8.5 G's.

Fighter squadrons at that time had 18 aircraft and 18 pilots, with each pilot assigned to a particular plane which he flew almost exclusively. VF-6 had just received the new Grumman F3F-1s. I was assigned #6 and my friend was assigned #18.

Between the two of us we discussed our success, or lack of it, in bombing. Ens. Stephens told me he had figured out that it was possible to wait until 1,400 feet to drop the bomb and then, with a snap or rip pullout, the plane would level by the minimum altitude of 1,000 feet. The accuracy was greatly increased and there was no tendency to black out. The only trouble was that the accelerometer read 16 G's, as I recall, on each pullout — a few more than the plane was stressed for. We reasoned that there must be a safety factor built into the stress strength of the F3F-1, which had quite a history during its test phase and a lot of publicity



**A Golden Eagle Recalls**

# Lessons Learned Are Forever

By VAdm. B. M. "Smoke" Streaan



Fifty-four F3F-1s were delivered in 1936 to serve with Navy and, later, Marine squadrons.

as an advanced fighter plane. We also wondered whether 16 G's was an accurate reading.

Steve made all of his dive bombing runs with the snap pullout, but I didn't like overstressing the aircraft. I was half-hearted about it because I was afraid that the plane would not hold together. Consequently, Steve's bombing scores were better than mine. But both of us, as new pilots, had impressive scores due to the lower release technique we had developed.

I had much confidence in a lieutenant in the squadron who was the gunnery officer. One day I went to him and asked, "Can you pull the wings off the F3F?" This lieutenant, who later became a rear admiral and a pioneer leader in Naval Aviation, answered, "There is not a man alive who can pull that plane apart."

I discussed this conversation with Steve, but he continued to use the snap pullout with 16 G's. I was still leery of using this method and continued to do it only part of the time.

On the final day of trials, the whole squadron took off with one miniature bomb on each airplane to make one dive each on the target to get a feel for the wind before the record drops.

The last plane in line was #18 with Steve as the pilot. It came apart in the pullout and the pilot and plane went straight in.

When we returned to our base at West Beach on North Island after that tragic event, the planes were grounded and the investigation begun. Shortly, my lieutenant friend, a member of the investigating team, remembered my query and asked me why I had questioned the plane's strength. I told him about the procedure that Steve and I had developed. They took my airplane apart, checked all measurements and clearances and for incipient failures, but found nothing. The planes were grounded for a period, then restricted, and finally returned to full service.

Since that experience, I have heeded the limitations as listed by the manufacturer, believed the instrument readings, and have never depended upon that mythical safety factor which may or may not be built into the aircraft.

I learned that any plane can be pulled apart by the pilot. ■

VAdm. Streaan is a member of the Golden Eagles, The Early and Pioneer Naval Aviators Association.

**T**hirty-five years ago last December, the harbor city of Hungnam, North Korea, was the scene of what has been described as an amphibious operation in reverse. It was the exit point for thousands of American and South Korean troops and civilians escaping the clutches of a massive communist force led by the Red Chinese who had entered the Korean conflict a few weeks before. Among those making the frigid, tortuous journey to the sea were U.S. Marines that had earlier taken positions at the Chosin Reservoir, 60 miles inland from Hungnam.

Captain J. Robert Lunney, JAGC, USNR-R, who submitted information for this article, was a Merchant Marine officer aboard SS *Meredith Victory* in the harbor during the evacuation. He recalled that allied units were "dangerously beleaguered by communist forces. We would not have prevailed without carrier air support." Capt. Lunney, an attorney in New York, is the Director of The Chosin Few, Inc., an organization of survivors of the Chosin Reservoir campaign, North Korea, November-December 1950. Although 35 years have passed since the evacuation, it remains an important milestone in the annals of military history.

Rear Admiral E. C. Ewen was in charge of Task Force 77 at the time. It had grown from two to four fast carriers by early December, including *Philippine Sea*, *Leyte*, *Princeton* and *Valley Forge*, the latter having been hastily recalled from the U.S.

In the daytime, carrier aircraft flew close air support and air cover missions for units within the embarkation area and, outside of it, interdicted enemy supply lines while supporting ground operations and providing air cover for the vast amount of shipping under way to and from Hungnam. At night, they flew heckling missions with the Fifth Air Force. Also, the Marine Corps recorded a milestone. U.S. helicopters from VMO-6 were used in combat for the first time, providing airlift and other support.

Task Group 96.8, composed of escort carriers *Sicily* and *Badoeng Strait* and light carrier *Bataan*, and led by Rear Admiral Richard W. Ruble, provided more air cover for ground units and the multitude of ships in the port.

The battleship *Missouri*, along with heavy cruisers *St. Paul* and *Rochester*, eight destroyers, and three rocket ships under the command of Rear Admiral

## Wall of Fire Around Hungnam



A Marine Corsair providing close air support to ground units in North Korea zooms skyward through the smoke after dropping napalm on a communist concentration.

Roscoe H. Hillenkoetter, bombarded an area stretching from 10 miles north to 10 miles south of Hungnam. Despite the circumstances, the withdrawal was expertly conceived and well executed.

The final day of withdrawal was December 24, 1950.

According to *The Sea War in Korea* (U.S. Naval Institute Press, 1957), Lieutenant R. B. Mack was the last pilot to fly over Hungnam. He said, "I was flying the last launch of the day as one of two F4U-5Ns...from *Princeton*. After a dusk launch, I received orders...to Hungnam as target combat air patrol.... After a very lonely trip, I arrived about 1900 and reported to *Mount McKinley*. The fighter director stationed me over Hungnam at 15,000 feet altitude. I had a grandstand seat for the most dismal and distressing sight I had ever witnessed.

"Below, the last of the troops and

supplies had been loaded on board the LSTs and other evacuation craft and were pulling away from the dock areas. There were fires everywhere...and, as I watched, flames broke out around the docks, growing and spreading until the whole waterfront seemed ablaze. Whatever had been left behind was being made useless for the Reds.

"As the LSTs cleared the beaches, several of our destroyers moved in and did their bit to ruin the real estate for future communist use. I circled Hungnam until 2045. The ships below formed up single file, nose and tail, like circus elephants and headed seaward and then south to Pusan.

"As I took departure for *Princeton*, I called *Mount McKinley* and we exchanged greetings. 'Merry Christmas,' we said, for it was Christmas Eve 1950...." ■

(continued from p. 1)

and continued in the Naval Air Reserve in 1964, flying P2Vs with VP-831 out of Floyd Bennett Field and with VP-741 and VP-62 at Jacksonville, Fla.

When the 75th Anniversary Program surfaced early last year, Cdr. Costarakis volunteered to leave a computer consulting business he was starting up in Jacksonville to get involved.

He says, "DIANA will allow faster and easier access to 75th Anniversary information by Naval Aviation personnel as well as the civilian community. With DIANA's Electronic Mail, the users can also give us ideas and opinions in writing on a daily basis."

For the Reserves he says, "It could save significant time and money because they can use DIANA to pass unclassified information back and forth with relative ease. The Reserves work on weekends so they can receive timely messages and information left on DIANA, respond and answer them immediately."

In terms of man-hour costs, Cdr. Costarakis has already seen real savings while using DIANA. He said, "Every time somebody logs on DIANA and downloads information it saves us at least one man-hour of work. That amounts to more than \$20, not to mention the cost in paper. It won't take long for DIANA to pay for itself many times over. It basically makes the staff's job easier."

From a technical viewpoint, he says DIANA can solve the "problem of incompatibility between computers." He

strongly recommends logging on DIANA and giving it a try.

Questions regarding DIANA should be directed to Cdr. Costarakis by calling commercial (202) 475-2739/40/1/2 or autovon 335-2739/40/1/2.

#### How to Log On DIANA

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**Baud Rate:** 300 or 1200

**Parameters:** 8 bits/1 stop bit/no parity,  
or 7 bits/1 stop bit/even parity.

All 5 1/4" diskette and cassette formats which are compatible with Naval Aviation News information systems:  
Actrix (Access Matrix) SS Associate  
ATR 8000 (Atari)  
Avatar TC10, 48 tpi  
Beehive Topper  
Byad CP/M-80  
Columbia Commander M964  
Columbia CP/M-80  
Compupro 10.5x1024  
Cromemco CDOS  
Datavue DV80  
DEC VT180  
DEC Rainbow 100 CP/M-80/86 & MS-DOS  
DECmate II WPS  
DECmate II CP/M  
DELTA Systems  
Digilog 1000 Tubodots  
Epson QX-10 CP/M, Valdocs  
Goupil III CP/M  
HP86A, 125 CP/M  
IBM-PC P-System 8 sec  
IBM-PC XT PC-DOS  
Idea Bitelux  
I.E.S.I.  
IMS 5000

ISM CP/M  
Kaypro II  
LNW CP/M 40 tpi  
Lobo Max80 CP/M  
Magic  
Morrow Designs  
NCR Decision Mate 5  
NEC PC8001a CP/M  
NEC PC801a CP/M  
NEC-DOS  
Novel  
Olivetti ETV 300 CP/M  
Olympia ETX II CP/M  
Olympia ETX 100 CP/M  
Osborne DD  
Osmosis DD (Osborne)  
Otrona Attache  
PMC Micromate DSDD 40 tpi  
Reynolds  
Reynolds TC 1000  
Sanyo 1000, 1100  
Sharp YX3200 CP/M  
Superbrain JR 35 tpi  
Superbrain QD 35 tpi  
Systel II  
Systel III  
Tandy 200 (cassette tapes)  
Teletek  
Televideo Turbodos  
Televideo TX802/803/806  
Texas Instruments Pro CP/M-80 SS  
Toshiba T100  
TRS80 Color Computer  
TRS80 Mod III FEC CP/M  
TRS80 Mod III FEC T80C  
TRS80 Mod III Holmes  
TRS80 Mod III Hurricane Labs  
TRS80 Mod III Memory Merchant  
TRS80 Mod IV CP/M Plus  
TRS80 Mod IV Montezuma  
TRS80 Mod IV Montezuma 1.44  
TRS80 Mod 100 (cassette tapes and diskettes)  
TRS80 Mod 200 w/Chipmunk Drive  
Wang MAWS CP/M  
Xerox 820 II SSDD  
Zenith w/Magnolia CP/M  
Zenith Z90 CP/M  
Zenith w/CDR CP/M  
Zenith Z100 CP/M  
Zorba SS

## PROFESSIONAL READING

By Commander Peter Mersky, USNR-R

*The History of U.S. Naval Air Power.* Ed. Robert L. Lawson.

The Military Press, New York, N.Y. 1985. 256 pp.

Illustrated. Indexed. \$14.95.

Making liberal use of color photography, this book is one of the best efforts to come along in several years. Bob Lawson is well-known as editor of the *The Hook* magazine as well as Navy photographer *par excellence*. He has collaborated with an equally impressive group of aviation writers, including Ray Wagner, Barrett Tillman, Cdr. David Erickson and Captain William Scarborough, to produce a book that is both visually exciting and interestingly written. The book covers all phases, periods and communities, from the fledgling period of 1911-1917 through the 1920s and 30s.

World War II, of course, serves as the centerpiece of the

book, with many never-before-published color photos depicting aircraft color schemes. Korea and Vietnam are equally well represented. The section on Vietnam contains the first color photo I have seen of a black RA-3B of VAP-61. Post-Vietnam Naval Air continues to the present day with interesting photography of aircraft used in the abortive Iranian hostage rescue mission in April 1980. Although the pink RH-53Ds have been seen occasionally, the views of A-7s of VA-97 and the F-4Ns of VMFA-323 with striking red and black wing bands have never been seen.

In addition to the photos, most major aircraft types are depicted with color profiles, varying in size up to two-page spreads. With a comprehensive index and glossary, this volume is a good value for the money.

## STATE OF THE ART

### F/A-18 Speed Brake



Northrop Corporation

This may look like a pet stingray but it's not. A Northrop Corporation technician inspects the outer skin of an F/A-18 *Hornet* speed brake at the company's Aircraft Division in El Segundo, Calif. The speed brake's skin is made of graphite composite which is lighter than aluminum and stronger than steel. Northrop is the principal subcontractor on the F/A-18 program to prime contractor McDonnell Douglas Corporation, St. Louis, Mo.

### Laser Maverick Missile

The first production model of the laser-guided *Maverick* missile, built by Hughes Aircraft Company for the Marine Corps, rolled off the assembly line recently.

Designated AGM-65E, the missile is intended primarily for close air support missions. Its seeker guides on the reflection of a laser beam aimed by a laser designator. This precise designation enables the *Laser Maverick* to be launched safely at targets located near friendly troops. The AV-8B *Harrier II*, F/A-18 *Hornet*, A-6E *Intruder* and A-4M *Skyhawk* are the Marine Corps aircraft currently designated to carry this missile.

Hughes presently has \$120 million in contracts for the *Laser Maverick* program. In addition to support equipment spares, the contracts call for the delivery of 275 tactical missiles by the end of June 1986.

### Coast Guard Gets New HC-130Hs

Continuing the modernization of its long-range surveillance aircraft fleet, the Coast Guard took delivery last fall of the first of six advanced model Lockheed HC-130Hs. The new propjet transport has greatly enhanced sea search and surveillance radar capabilities, advanced Allison T56-15 engines, special scanner windows and a 10-tube aft flare launch system. Thanks to its low-speed controllability, the HC-130H can fly "low and slow" over target areas. For example, on drug interdiction missions, the Coast Guard C-130s sometimes swoop down to 50 feet over the water to identify and photograph suspect ships. This information is then fed into drug enforcement agency computers.

The Coast Guard uses its long-range C-130 fleet in a variety of missions, including search and rescue, enforcement of laws and treaties, marine environmental protection, iceberg patrols and cargo/personnel transport. It is one of the largest operators of the surveillance/patrol version of the *Hercules* transport.

## awards

### Davison Award

The *Lobos* of VA-305, NAS Point Mugu, Calif., won the F. Trubee Davison Award as the best tailhook squadron in the Naval Air Reserve. During the 1985 competitive period, the squadron exceeded Commander, Naval Reserve Force training requirements, received the CNO Safety Award, and improved drill and overall attendance rates. VA-305's skipper is Cdr. Robert Lind.

The McDonnell Douglas-sponsored award honors Lieutenant 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.

### Jackson Award

Ensign John K. Einhorn is the 1985 winner of the William E. Jackson Award presented to an undergraduate or graduate student studying for a degree in aviation electronics or telecommunication systems. Sponsored by the Radio Technical Commission for Aeronautics, the award is a memorial to Jackson, an outstanding pioneer in the development and implementation of the present airways, air traffic control and aviation communication systems.

The winning paper, "Probabilistic Modeling of Loran-C for Nonprecision Approaches," was submitted by Einhorn for his master's degree in the Department of Aeronautics and Astronautics at M.I.T. He was commissioned an ensign in May 1985 through the NROTC program and reported to NAS Pensacola, Fla., the next month for flight training.

## Awards

VS-24 was recently presented the "Hook 'em" Award by VAdm. Frank B. Kelso II, Commander Sixth Fleet, during ceremonies on board *Nimitz*. This award recognizes ships, submarines and squadrons attached to the Sixth Fleet that have demonstrated outstanding ASW skills. The *Scouts* earned this award for their operations conducted in the Mediterranean during FY 85.

Lt.Cdr. Mark Milliken, VAW-125 operations officer, was named ComNav-AirLant's 1985 NFO of the Year. He was instrumental in the *Tigertails* operational readiness evaluation score of "superior" as well as the successful completion of various exercises during *Saratoga's* workups.

NAS Willow Grove, Pa., was presented the coveted CNO Bronze Hammer Award for FY 84. The station earned this honor by doing the most "self-help" improvement projects while saving taxpayers \$440,000 in contractors' fees. The projects included a base directory and paved turnaround; a fitness trail; and refurbishing the community services building and station swimming pool.

## Anniversary

One of the oldest aircraft carriers in the fleet celebrated her 30th birthday recently. Since returning to home port, Mayport, Fla., from a 28-month service life extension program (SLEP), *Forrestal* (CV-59) has completed numerous sea trials, some shakedown training and carrier qualifications. These evolutions will be repeated this spring to prepare her for an upcoming Mediterranean deployment. *Forrestal's* SLEP extended her life expectancy from 30 to 45 years.

## Photojournalist of the Year



Bill Toth

JPCS Kirby Harrison is now a three-time winner of the Navy's Photojournalist of the Year Award, presented by the Chief of Information. As the recently announced 1984 recipient of the coveted award, Senior Chief Harrison, *Naval Aviation News's* associate editor, also received it in 1972 and 1983. He is the first person to win this award three times.

During the competitive period for the latest award, Harrison led a handpicked team of photojournalists assigned to cover *Unitas XXV* and produce a commemorative book specially commissioned by the Chief of Naval Operations. *Unitas* is a joint U.S.-South American naval exercise conducted annually.

In addition to working for *NA News*, Senior Chief Harrison contributes his considerable talent to the 75th Anniversary of Naval Aviation Staff and its numerous projects scheduled throughout 1986. The 75th Staff is colocated with the magazine and Naval Aviation History staffs in Washington, D.C.

## Rescue

Six British citizens, whose yacht sank after running aground on an island off the coast of Italy last August, were rescued by crew members of HC-8, Det 1 and USS *Kalamazoo* (AOR-6).

The yacht lost its steering and rudder about a mile off the Island of Zannone and was driven against the rocks by winds gusting up to 40 knots. *Kalamazoo* received the distress signal approximately

13 miles away from the site. An Italian Coast Guard cutter and a fishing boat were on the scene but could not render assistance due to the high winds and rough seas. An HC-8 CH-46 was launched to locate the survivors who had abandoned the boat and made their way up a cliff to a lighthouse. The steepness and roughness of the terrain made rescue difficult until a narrow strip of shoreline was found for landing a mile from the wreck.

A crew member was hoisted down to recover the survivors, who were eventually brought on board *Kalamazoo* for medical examination. Following a hot meal, they were flown to Naples, Italy, and were met by U.S. Naval and British consulate personnel.

## Honing the Edge

CVWR-20 deployed 1,025 Selected Reservists in seven fixed-wing squadrons and a helicopter unit to perform their



Lt. Francois

No details were overlooked during this AcDuTra. Deck crewmen on *Eisenhower* examine arresting gear to ensure all systems are go. In the background is a KA-3B Skywarrior of VAK-208 from NAS Alameda, Calif.

annual two weeks of active duty for training on board *Eisenhower* (CVN-69). Personnel from VFs 201 and 202, NAS Dallas, Texas; VA-204, NAS New Orleans, La.; VFP-206, NAF Washington, D.C.; VAW-78 and VAQ-209, NAS Norfolk, Va.; VAK-208, NAS Alameda, Calif.; and HS-75, NAS Jacksonville, Fla., worked side by side aboard *Ike*. A wide range of tactical warfare training missions were flown in the Atlantic off Cape Hatteras, N.C.



## Reserves

For the second consecutive year, the Naval Reserve has reached its goal of 10,000 enlistments into the Sea-Air Mariner (SAM) program. The 10,000th enlistee for FY 85, James E. Keller, from Hallidayboro, Ill., is scheduled to attend recruit training and basic electronics school in San Diego, Calif.

## Records

The following units marked accident-free flight time: HC-6, 25,000 hours; HMM-365, 75,000 hours and 22 years; VAW-120, 41,000 hours and 11 years; VRC-40, 70,000 hours and nine years; VS-33, 118,000 hours and 25 years; VS-37, three years; VT-23, 124,000 and five years; and VT-25, 51,000 hours and four years.

Capt. Charles D. Godby, HMM-161, recently completed 4,000 career flight hours. He has been flying Marine helos for seven years.

Four VS-24 *Scouts* achieved 1,000 flight hours in the S-3A: Lt.Cdrs. Tom Costello and Charlie Dorsett, Lt. Joe Burson and AW2 Harry Bell.

The *Knightriders* of VA-52 have completed 45,000 hours and nine years of mishap-free flight operations. Safely performing operations such as dropping sonobuoys (in photo) has resulted in the *Knightriders* winning the CNO Safety Award in 1980, 1983 and 1984 and, most recently, the ComNavAirPac Battle Efficiency Pennant in 1984.



## Et cetera

RAdm. George M. Furlong, Jr., a Naval Aviator with 4,000 flight hours and 900 carrier landings began a new chapter in his life when he retired January 1, 1986, from active service. His new career as executive vice president of the Naval Aviation Museum Foundation, Pensacola, Fla., combines the duties of executive director and chief fund raiser.



PH1 Cliff Spencer

Two legends familiar to the Alameda, Calif., area recently returned. LtGen. Jimmy H. Doolittle, Honorary Naval Aviator No. 15, and the venerable B-25 aircraft both made their way to NAS Alameda at the request of *Air Beat* magazine, whose staff is doing a feature article on the general. The fully restored B-25 (in photo) is owned by a private citizen from Van Nuys. Alameda is the general's birthplace and it was from the air station that 16 B-25s were loaded aboard USS *Hornet* on April 1, 1942, for a raid on the Japanese homeland.



Established on July 1, 1985, at NAS Lemoore, Calif., VFA-136 recently received approval for this insignia which depicts the squadron nickname, *Knighthawks*. Currently undergoing training and becoming acquainted with their new aircraft, the F/A-18A *Hornet*, this squadron will move to NAS Cecil Field, Fla., in April 1986 to join CVW-13.

## Change of Command

ComCarGru-1: Como. Charles R. McGrail, Jr., relieved RAdm. Bud Edney.

NATC: Como. John K. Ready relieved RAdm. E. J. Hogan, Jr.

VA-27: Cdr. Joseph P. Sciabarra relieved Cdr. Hugh D. Connell.

VAQ-136: Cdr. Dana B. McKinney relieved Cdr. Thomas J. Ford.

VAW-117: Cdr. Mark E. Allen relieved Cdr. Dannie H. Allen.

VF-84: Cdr. Richard A. Kennedy relieved Cdr. John W. Craine.

VF-101: Cdr. John F. Manning relieved Cdr. Larry L. Ernst.

VFP-206: Cdr. David G. Strong relieved Cdr. Cary D. Carson.

VP-48: Cdr. Gregory A. Bushnell relieved Cdr. Dan L. Speed.

VP-50: Cdr. Denis F. Beaugureau relieved Cdr. Donald A. Giles.

VP-65: Cdr. Stephen P. Hawes relieved Cdr. David L. Hargis.

VR-61: Cdr. D. L. Creighton relieved Cdr. D. S. Wilder.

VS-0294: Cdr. John E. Hickman, Jr., relieved Cdr. Pat H. Pattison.

## Save the Lex

The only active WW II aircraft carrier, USS *Lexington*, is in her 42nd year of service and her future is in doubt. We who served on her from Tarawa to Tokyo believe that, when retired, the "Blue Ghost" should be returned to Boston as a floating memorial and tourist attraction.

We are preparing a petition to this effect that will be presented to the U.S. Navy. If any readers are sympathetic to our cause, they can help. Just write "Save the Lex" on a postcard, include your name and address, and send it to me at the address below.

John Oparowski  
2486 Corbin Ave.  
New Britain, CT 06053



## AC History

The Navy's air traffic control school command, NATTC Memphis, TN, is compiling a history of the U.S. Navy's air controlman/air traffic controller (AC) rating. Desperately needed are photos, patches, publications, sea stories and other memorabilia. Send submissions to ACC(AW), Don Gunja, AC Historian/Project Manager, c/o FACSFAC, NAS North Island, San Diego, CA 92135, autovon 951-6845, commercial (619) 437-6845/8777.

## Towers Biography

I am writing a biography of Admiral John H. Towers (1885-1955) and would appreciate correspondence, anecdotes and photographs.

Clark G. Reynolds  
1223 Manor Lane  
Mt. Pleasant, SC 29464

## Navy Memorial

A miniature of the "Lone Sailor" statue, which will be the central figure of the U.S. Navy Memorial, is admired by (left to right) Chief of Naval Operations Admiral James D. Watkins, Secretary of the Navy John Lehman and retired Rear Admiral William Thompson, President of the U.S. Navy Memorial Foundation.

The Lone Sailor symbolically repre-

sents all of the U.S. Navy "bluejackets" that have served the Navy and the nation since 1775. The memorial, an amphitheater where the Navy Band and other service bands will hold summertime concerts, is being constructed on Pennsylvania Avenue in Washington, DC, and is planned for completion in the spring of 1987. For information about the memorial, call the toll-free number 1-800-821-8892 (in Virginia, 1-800-533-4079).

## Army History of Vietnam

The official U.S. Army history of the Vietnam conflict is being published as a multi-volume series by the U.S. Army Center of Military History. All of these books will be sold by the Government Printing Office. To receive timely announcements of each volume's publication, send your name and address to the

Superintendent of Documents, Mail Stop MK, Washington, DC 20401, and ask to be put on Priority Announcement List N-534.

## Grumman Book

I am writing a book on the history of Grumman Aerospace Corporation and am seeking individual experiences of pilots and others directly involved with Grumman aircraft (all vintages).

Terry C. Treadwell  
45 Forest View Road  
Moordown, Bournemouth BH9 3BH  
England



The above insignia were recently approved by the Insignia Board.

## Aero Club

As a long-time member of the military Aero Club community, I have been conscious of the sometimes precarious

relationship between "civilian" pilots and the host naval or Marine Corps air stations where the clubs exist. It is a privilege to be able to operate an Aero Club aboard the local NAS or MCAS, and that privilege should be maintained through safety awareness and adherence to local operational procedures.

Since there is no publication for these flying clubs, I would like to solicit responses from all Navy or Marine Corps Aero Clubs to determine the need or interest in establishing a service-wide newsletter. The publication would stress safety and procedures, and include recreational and news items. If there is a forum for Aero Club pilots to discuss their particular type of flying and safety topics, I think that an all-around safer environment will exist aboard our air stations.

I hope to hear from all USN/USMC Aero Clubs, as well as USAF, USAFAUX (CAP), USA, USCG and USCGAUX clubs/flight activities. Call me at autovon 991-6759/6733 or write:

SSgt. Steven J. Robeson, USMC  
MAG-49, 4th MAW  
NAS Willow Grove, PA 19090-5030

#### CVE Book

I am researching for a book which will be called *Allied Escort Carriers of World War 2 in Action*. I would be grateful if anyone who served aboard, or their friends or relatives, would write to me about personal recollections of action with these ships in the Atlantic, Mediterranean and Pacific. I am also interested in photographs.

Kenneth Poolman  
48 Wellington Rd., Hampton Hill  
Middlesex TW12, IJT, England

#### Oldest Navy Periodical

*Naval Aviation News'* masthead has an additional notation in this issue. Allow us to blow our horn. *NA News* is one of the four oldest military periodicals and THE OLDEST NAVY periodical. *Armor* magazine (Army) was first published in 1888, followed by the *Field Artillery Journal* (Army) in 1911, *Leatherneck* in November 1917 and *NA News* in December of the same year.

#### Liftmaster

I am pursuing a research project on the Navy and Marine Corps use of the Douglas R6D-1/C-118B *Liftmaster*. I would be grateful for information, hangar tales, sea stories or photographs from former crewmen, especially those who served with the *Liftmaster* in Fleet Logistic Air Wing and Military Air Transport Service squadrons in the early 1950s.

Nicholas M. Williams  
American Aviation Historical Society  
208 Pine St.  
Waverly, IA 50677

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#### Reunions, Conferences, etc.

Covered Wagon Association, USS Whipple and USS Pecos joint reunion, May 28-31, Las Vegas, NV. Contact E. L. Dixon, 1075-275 Space Pkwy., Mt. View, CA 94043, (415) 968-5172.

USS Minneapolis (CA-36) reunion, June 25-28, San Diego, CA. Write Donald J. Bovill, 2804 Gene Lane, Arlington, TX 76010.

Naval Air Transport Squadrons, Inc. reunion, August 17-22, Washington, DC. Contact Victor Kish, 12766 Silver Lane, Sugar Creek, MO 64050.

VPB-52 Black Cats reunion, May 16-18, Orlando, FL. Contact Saul Frishberg, 1021 Jeffrey Dr., Southampton, PA 18966, (215) 357-6829.

University of Pennsylvania NROTC Alumni League being formed. For information, contact Lt. Tom Gallagher, 3000 South St., Philadelphia, PA 19104-6399, (215) 898-7436/37.

15th Biennial Scientific Session of the Joint Committee on Aviation Pathology, 7-9 October, RAF Institute of Pathology and Tropical Medicine, Halton, England. Call for papers due no later than 1 May. For details, contact Maj. Canik, Armed Forces Institute of Pathology, Washington DC 20306-6000, autovon 291-3232 or commercial (202) 576-3232.

VC-3/USS Kalinin Bay (CVE-68) reunion planned for early April 1986 in

San Diego, CA. For information, please contact Theodore H. Gardner, USS *Kalinin Bay* (CVE-68), 7 Elmhurst Pl., Cincinnati, OH 45208.

Association of Naval Aviation Symposium '86, May 6-10, Pensacola, FL. The following reunions will coincide with this meeting:

Flying Midshipmen Association. Contact Ort Rudd, P.O. Box 15489, Arlington, VA 22215, (703) 892-1400.

Mariner Association. Contact Frank Dunigan, 1106 Brantin Rd., Wilmington, DE 19803, (302) 478-3159.

SB2C Aircraft. Contact Cdr. J. Alton Chinn, USNR(Ret.), 2558 Blaze Trail, Diamond Bar, CA 91765, (714) 861-8792.

AD/A-1 Skyraider Aircraft. Contact N. Douglas Francis, P.O. Box 893, McLean, VA 22101, (202) 694-8008 or (703) 938-1361.

VPB-116. Contact Philip W. Smith, FMC, 1100 L Street, N.W., Suite 11502, Washington, DC 20573, (202) 523-5712.

VP-6. Contact A. F. Farwell, 10933 Seaglade Dr., Pensacola, FL 32507, (904) 492-0050.

Yangtze River Patrol Association reunion, May 7-10, Albuquerque, NM. Write Lt. Cdr. John H. Geyer, USN(Ret.), 1056 Bobolink Dr., Virginia Beach, VA 23451.

Industrial College of the Armed Forces Mobilization Conference, May 22-23, Fort McNair, Washington, DC. Individuals and organizations interested in presenting the results of their research or study, please send papers by February 15 to: Mobilization Conference Committee, Industrial College of the Armed Forces, Washington, DC 20319-6000, autovon 335-1794 or commercial (202) 475-1794.

Banana Fleet Marines reunion planned in 1986. Contact Hank Thalgot, Box 95, Oxford, FL 32684, (904) 748-2587.

VPB-26 Black Cats reunion, May 6-11, Pensacola, FL. Contact W. L. Williams, Rt. 11, Box 287, Milton, FL 32570, (904) 623-5740.

USS Belleau Wood (CVL-24) and attached air groups reunion, May 27-June 1, Las Vegas, NV. Contact Richard D. Fread, P.O. Box 846, Annandale, VA 22003, (703) 642-5670.

HS-5 30th anniversary celebration, January 3, Ramada Inn, Mandarin Landing, Jacksonville, FL, beginning at 1830. All former *Nightdippers* are encouraged to attend. For details, call Lt. W. P. Birch, autovon 942-5756 or commercial (904) 262-5756.

