NAVAL AVIATION NEWS

LSO

NAVAL AVIATION NEWS

Oldest U.S. Navy Periodical
Volume 70, No. 2
(USPS 323-310/ISSN 0028-1417)
Flagship Publication of Naval Aviation
Vice Admiral Robert F. Dunn Deputy Chief of Naval Operations (Air Warfare)
Published by the Naval Historical Center
under the auspices of the Chief of Naval Operations
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COVERS—Front: Peter Mersky filmed the *Tomcat* snaring a wire. LSOs in lower photo are, L-R, Lt. R. Broadaway, VAW-117; LCdr. P. Grandfield, CVW-11; and Lts. B. Hebner, VS-21; B. Kenison, VF-114; D. Canin, VA-22; and J. Shattuck, VA-95. Paddles were using the manually operated visual landing aid system aboard *Enterprise* during World Cruise 1986. Back: JO2 Julius L. Evans filmed the recently unveiled Navy Memorial in Washington, D.C.

Features

Departments

Naval Aviation News is the flagship publication of Naval Aviation. Its mission is to publish current and historical information which encourages pride and professionalism, enhances safety and advances the goals and objectives of the Chief of Naval Operations. Naval Aviation News is published bimonthly by the Chief of Naval Operations and the Naval Historical Center in accordance with Navy Publication and Printing Regulations P-35 (revised May 1979). Opinions expressed are not necessarily those of the Department of the Navy. Reference to regulations, orders and directives is for information only and does not by publication herein constitute authority for action. All material not copyrighted may be reprinted. Naval Aviation News offices are located in Building 159E, Room 512, Washington Navy Yard Annex, Washington, D.C. 20374-1595. Phone (202) 433-4407/8/9, autovon 288-4407/8/9. Annual subscription is available through Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Phone (202) 783-3238. Second-class postage paid at Washington, D.C., and additional mailing offices. POSTMASTER: Send address changes to GPO Order Desk, Superintendent of Documents, Washington, D.C. 20402.

Captain Zip Rausa visited the Navy's landing signal officer school. While there he had some frank discussions with instructors and students covering what it takes and the career impacts of the "Paddles' Profession." **Page 4**

Under Secretary of the Navy, H. Lawrence Garrett, speaks on the uncertain skies that lie ahead for naval aviation, in light of national deficit reduction plans. His remarks to a gathering of aviators in the Washington, D.C., area call for strong leadership at all levels. **Page 10**

Two articles review the role of remotely piloted vehicles. In a reprint from Naval Institute's *Proceedings,* Cdr. Daniel Parker covers the history and current applications for RPVs while JO2 Evans takes an in-depth look at the *Pioneer,* now undergoing operational testing. **Page 12**

Airspace management is a giant job for small commands. The Fleet Area Control and Surveillance Facilities play an important role in scheduling, controlling and preserving this valuable resource. FACSFac Virginia Capes is a "Giant Killer" in airspace management. **Page 20**

A photo essay depicts the people, places and aircraft that played an important part of the mission over the years. The photographs are part of the personal collection recently donated to the Naval Aviation History Office by Mr. Dino Brugioni. **Page 22**

In a continuing series of articles relating his personal experiences in flight training, Ltjg. Roorda writes about first-time carrier qualifications. "To Qual" relates his view of the most difficult skill a Naval Aviator must master. **Page 28**

Helicopter Emergency Egress Device

Fifty percent of the 897 survivors of helicopter mishaps at sea over a 12-year period had to escape from a submerged aircraft. In 102 ditchings studied, there were 82 fatalities. Of those, 29 were drownings with many more suspected drownings.

Help was found on the commercial market in the form of a tiny scuba tank. After a three-year study, the tank was approved by the Navy for use by aircrew. Known as the helicopter emergency egress device (HEED), it provides two to four minutes of air for helicopter crewman. The 22-ounce tank is carried on the crewman's survival vest in a zippered pocket. The valve is opened before takeoff. To breathe, the crewman simply puts the device in his mouth and inhales.

The Aviation Physiology Training Unit at MCAS El Toro, CA, has been training Marine Aircraft Group 16 aircrewman to use the HEED since early 1987. Before a HEED bottle is issued, an aircrewman must successfully complete the instruction, which is part of water survival training. HEED is a backup system to normal egress. If the exit from the aircraft is blocked, the HEED provides extra time which may save an aircrewman's life.

F/A-18C Delivered

The newest version of the McDonnell Douglas F/A-18 *Hornet* was delivered to the Navy. The F/A-18C can protect itself from enemy weapons systems by using the airborne self-protection jammer (ASPJ) to confuse enemy radar signals. The new *Hornet* can employ the advanced, medium-range, air-to-air missile (AMRAAM), and the infrared imaging *Maverick* air-to-ground missile. Included in the upgrade program are a faster, higher-capacity mission computer; a flight incident recording and monitoring system (FIRAMS); and provisions for reconnaissance equipment and the Navy aircrew common ejection seat.

The new strike fighter was flown, by LCdr. John Bell, from the McDonnell Douglas plant in St. Louis, Mo., to the Naval Air Test Center, Patuxent River, Md., where the plane is scheduled for testing.

McDonnell Douglas Corp.

The F/A-18C made its first flight from company facilities in St. Louis in September 1987.

F-14A (Plus) Tomcat

The first production F-14A (Plus) *Tomcat* was accepted by the Navy on November 16, 1987, at Grumman Corporation's Calverton, NY, facility. This aircraft will be assigned to the Naval Air Test Center, Patuxent River, Md., for flight testing. The most significant feature of the F-14A (Plus) is its two new, more powerful General Electric F110-GE-400 engines. This power plant increases the F-14's total available thrust from about 42,000 pounds to over 56,000 pounds. It also provides the *Tomcat* with improvements in operability, reliability, maintainability and fuel consumption.

By 1990, Grumman is scheduled to produce 38 F-14A (Plus) aircraft, and to remanufacture 32 existing F-14As to the new configuration.

Grumman Corporation

The first F-14A (Plus) production aircraft at Grumman's Calverton, NY, flight test facility.

S-3B Contract Mod

The Navy awarded Lockheed Aeronautical Systems Company a $49.6-million contract for the procurement of support and test equipment for the S-3B *Viking* weapons systems improvement program. This is a modification to the original S-3B retrofit contract which gives the Navy's S-3A improved antisubmarine warfare capability. The mod provides for the procurement of the balance of the required support equipment, including automatic diagnostic software and associated hardware to test S-3B avionics.

RPV Contract

Northrop Corporation was awarded a $3-million design contract by the Navy in the Navy/Marine Corps/Air Force medium-range, remotely piloted vehicle (RPV) and target variant competition. The NV-144, Northrop's contender, is an advanced, high-subsonic, unmanned airborne vehicle designed to provide day and night tactical reconnaissance and targeting capabilities. The 19.5-foot-long vehicle can be launched from land, ship or aircraft and can accommodate a maximum 300-pound payload for reconnaissance, weather data collection, electronic intelligence and electronic warfare missions. It has a range of over 950 nautical miles and can be recovered from land or water.

Step and Stop

It was after sunset, there was a solid overcast, and the airfield was very busy with planes, especially P-3 *Orions*. Daytime construction was underway which reduced parking space. In fact, some P-3s were positioned between the hangars.

An *Orion* landed, taxiied in and was assigned a spot between the hangars by maintenance control. A lineman signaled the aircraft to proceed toward the spot. A fuel truck, unattended, was parked near the hangar along the route. The lineman wanted the *Orion* to proceed past the truck but his supervisor on the ramp and the pilots in the cockpit decided this might be unsafe. The aircraft was halted short of the fuel truck. The crew shut down the engines. When the props stopped turning, the cabin door was opened and the ladder extended downward.

Crew members involved in the tactical aspects of the flight departed for the debriefing room while the others began a post-flight inspection. The station ground crew, however, had to move the P-3 because another *Orion* was coming in. The intent was to tow the first aircraft past the fuel truck and into another parking spot.

After two crew members descended the ladder, the ground crew, without communicating its intentions, folded the ladder back against the fuselage and prepared to tow the plane. From inside the P-3, looking out the door toward the dimly lit ramp, the ladder appeared to be in the proper position for debarking. A third crew member stepped on the top rung but noticed that the ladder was set at an unusually steep angle. He nearly fell out the door but caught himself at the last instant. He could have dropped 10 feet to the pavement and certain injury

Grampaw Pettibone says:

About 2,500 years ago, that Greek historian fella, Herodotus, put it down that "Haste in every business brings failures." (Once in awhile ole Gramps dusts off Bartlett's.) Imagine, all those years have gone by and we're still makin' the same mistakes from hurryin'!

Sometimes ya gotta hustle. But short of a fire igniting or some other catastrophe, why rush movin' planes around, 'specially when it's dark out? Just when you think you're runnin' outa time, that's the time to tarry, or at least stop, look, listen and COMMUNICATE!

Wanna bet that crewman's next stop would be the dispensary, or worse, if he'd taken that first long stride straight down?

Missing Manual

A NATOPS manual was used by a qualified member of a squadron's maintenance department to troubleshoot the main electrical load center in a P-3 *Orion*. Upon completion of the job, the technician returned to his work center. Another member of the shop noticed that the manual was missing from the set of publications. Personnel searched for the manual but couldn't find it.

The individual who last had the manual was asked where he might have left it. He said he did not know, but he "knew for certain" that it was not left on the aircraft. His shop supervisor accepted this statement but did not report the missing manual to his division chief or maintenance control.

Three days later, the manual was found on the floor in the main electrical load center by an aircrew member on a routine interior inspection.

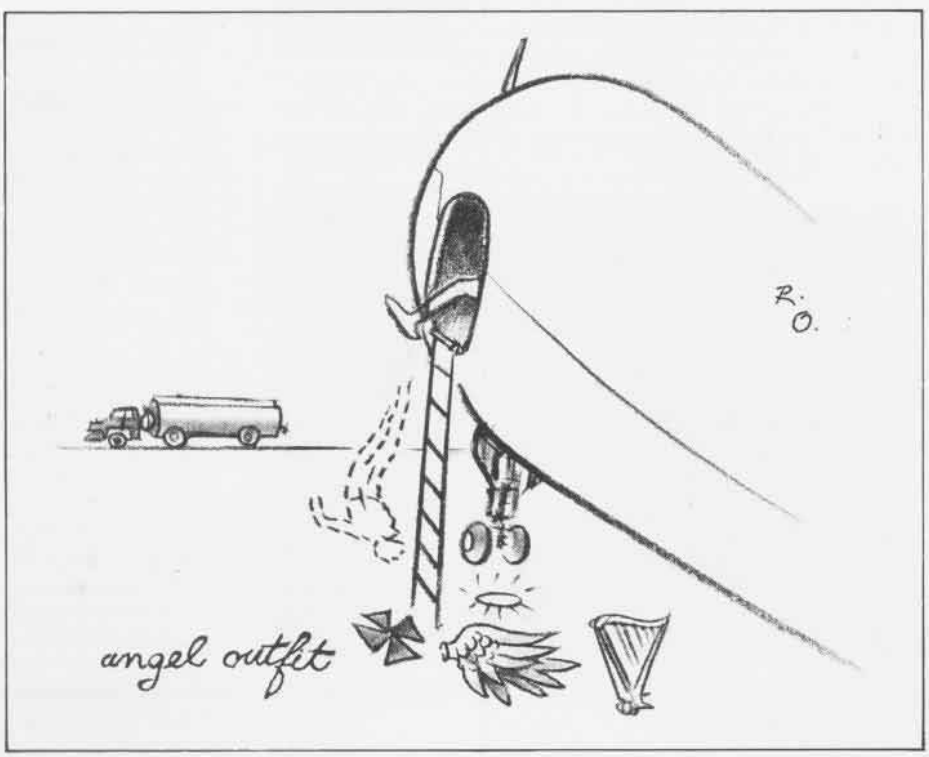
Grampaw Pettibone says:

No big deal, right? Just a book left adrift on the deck, right?

Wrong.

A book the size of a NATOPS or technical manual could be tossed about by turbulence in flight and do some damage. In this case, the bird could lose electrical systems, have a fire, or worse.

The division chief took responsibility for the missing manual and investigated the case. First off, the loser of the book should have reported it. So, too, the work center supervisor. Also, he



ILLUSTRATED BY Osborn

shouldna taken as gospel the person's word that the manual wasn't on the aircraft. I'm all for trust and confidence, but when it comes to aircraft, there are times when we go beyond those commodities. Follow-up is a must.

Others pointed out that the manual really wasn't a tool and therefore not subject to inventory. Maybe not. But common sense oughta have prevailed here.

Your ole Gramps doesn't want to make a mountain out of a mole hill but I know a few mole hills that can trip you up.

This squadron did the right thing. They looked at the problem, modified inventory control procedures and, as the C.O. put it, reemphasized "the vital importance of openness for the sake of safety."

Danger Zones

On the flight deck, 11 aircraft were scheduled for a daytime launch. An A-6E was on catapult number four. On cat three was an A-7E and behind it and the jet blast deflector (JBD) was another A-7E. The *Corsair II* on cat 3 launched normally. The *Intruder* began final preparations to go into tension. The pilot of the *Corsair* behind cat three radioed primary control and signaled his flight deck director that he had a turbine outlet temperature gauge failure. Word was passed that this aircraft was down and was to be spun clear of the catapult in order to allow the launch to proceed.

The Fly 3 (the aft third portion of the flight deck) petty officer decided to spot the *Corsair* aft along the starboard side.

The director signaled the A-7 to taxi ahead a short distance, then gave the pilot a right turn signal. At the same time, the *Intruder* on cat four went into tension with full power. Two final checkers were on either side of the A-6, behind the wing tips and abreast of the tail. The right side final checker was in the standard final checker posture, facing the aircraft with his body lowered down on one knee and his other leg fully extended toward the JBD. He held a padeye with one hand. His other arm was raised upward with a thumb up, indicating the aircraft was ready to launch. His back was toward cat three.

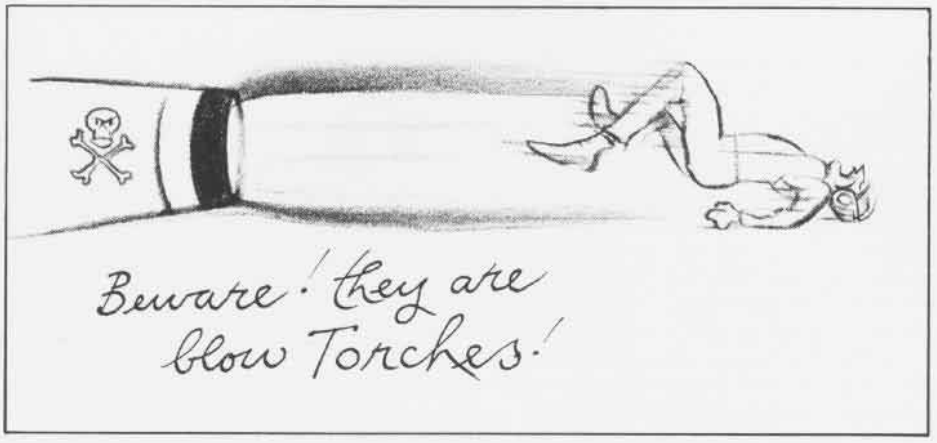
The *Corsair* pilot added power above idle to complete his right turn. As the A-7 traveled through 40 degrees of turn, the director passed control of it to the Fly 3 petty officer who was situated to the right of the A-7 just ahead of the number four cross-deck pendant.

As the *Corsair*'s nose passed through 90 to 120 degrees of turn, tail exhaust swept across the area where the *Intruder*'s starboard side final checker was positioned. The tailpipe was 25 feet from the checker. He was knocked down by the exhaust and began sliding on his back, feet first, toward the tail of the *Intruder*.

At the 120-degree point, the *Corsair* lost momentum and momentarily stopped. The A-7's exhaust was pointed at the downed checker for one to two seconds. The *Corsair* continued the turn, at which time the nose went out of limits. The aircraft jerked to the right about three feet.

The *Corsair*'s director then saw the checker sliding and signaled the A-7 to stop. The checker continued to slide on his back directly toward the tail area of the *Intruder* awaiting launch at full power.

As the checker entered the exhaust flow from the A-6, he was accelerated aft at a tremendous rate, slamming into the JBD. The exhaust flow carried him up and over the deflector about 20 feet above the flight deck and over the side into the sea. He was retrieved within minutes by a whale boat from an escort ship, but CPR failed and the checker was pronounced dead after two hours of resuscitative efforts.



Grampaw Pettibone says:

Ole Gramps has a special place in his heart for the men who work the flight deck. And it breaks that heart to lose one like this. The people who keep 'em flyin' are the very strength of Naval Aviation. We can't afford to lose a single one!

Communications were poor during this aircraft move, and one of the directors lacked the necessary experience to operate without supervision during high-tempo flight deck ops.

We talk about problems with "situational awareness" in the sky. Problems of situational awareness on the flight deck sure played a part in this awful loss. The hard, hot wind that comes out the blow torch end of jet machines is brutal, strong and merciless. If it's not vectored in the right direction, it can kill.

Some of the troops involved in this accident had to be tired. They were working on four hours of sleep and had been up for 10 to 11 hours straight. There ain't much we can do about this, except to appreciate the problem, help each other out, and remember that the flight deck is one big danger zone with a lot of smaller danger zones inside it.

ATTENTION TO BRIEF!

A Naval Aviator recently lost his wings because of a flathatting mishap in the helicopter he was flying. He deviated from the assigned mission to fly around a friend's house. The helo developed power difficulties, ran into power lines, and landed safely, although the aircraft was damaged (class B).

Amazingly, he told the flight leader during the preflight brief that he *intended* to proceed to the friend's house. The flight leader let it happen!

C.O.'s: Would the climate of professionalism in your outfit lead to such a breach of conduct? If there is any doubt, you had better turn those attitudes around, and fast!

LSO School and the

It's a one-of-a-kind operation and the kind-of-one that nourishes the very heart of U.S. naval carrier aviation. It's the Navy's Landing Signal Officer (LSO) School at NAS Cecil Field, Fla. With only four officers and four enlisted personnel on the staff, and rather modest classroom accommodations on the second deck of hangar number 67 at the Jacksonville base, it is a learning institution which is small in stature but huge in importance.

Lieutenant Commander Craig Cuninghame is officer in charge (OinC) of the LSO school. He flew A-7s — now pilots F/A-18s — has 2,700 flight hours, 500 traps and an abundance of long days and nights "waving" aircraft from the platform at the back end of carriers and the approach end of shore-based runways.

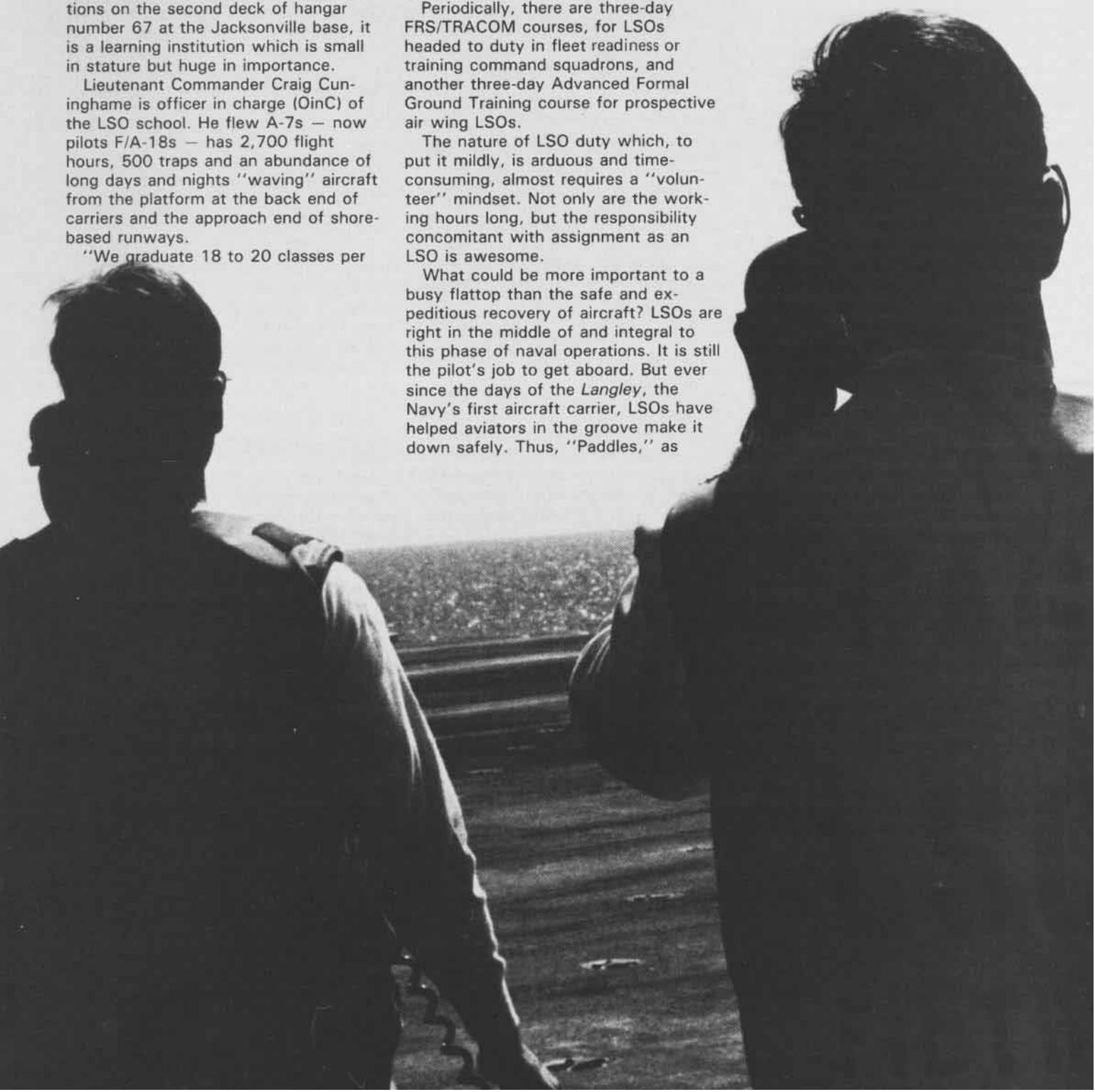
"We graduate 18 to 20 classes per year," he explained. "Each class is usually comprised of 14 to 17 officers from the Navy and Marine Corps. With rare exception, they are all volunteers and all are strongly recommended by their C.O.'s. We also train LSOs from the French, Argentine and Brazilian navies."

Periodically, there are three-day FRS/TRACOM courses, for LSOs headed to duty in fleet readiness or training command squadrons, and another three-day Advanced Formal Ground Training course for prospective air wing LSOs.

The nature of LSO duty which, to put it mildly, is arduous and time-consuming, almost requires a "volunteer" mindset. Not only are the working hours long, but the responsibility concomitant with assignment as an LSO is awesome.

What could be more important to a busy flattop than the safe and expeditious recovery of aircraft? LSOs are right in the middle of and integral to this phase of naval operations. It is still the pilot's job to get aboard. But ever since the days of the *Langley*, the Navy's first aircraft carrier, LSOs have helped aviators in the groove make it down safely. Thus, "Paddles," as LSOs are known because of signaling devices resembling small tennis rackets that they used until the early 1960s, have been and will continue to be permanent fixtures in the carrier aviation scenario.

Fortunately, the caliber of LSO is



Paddles' Profession

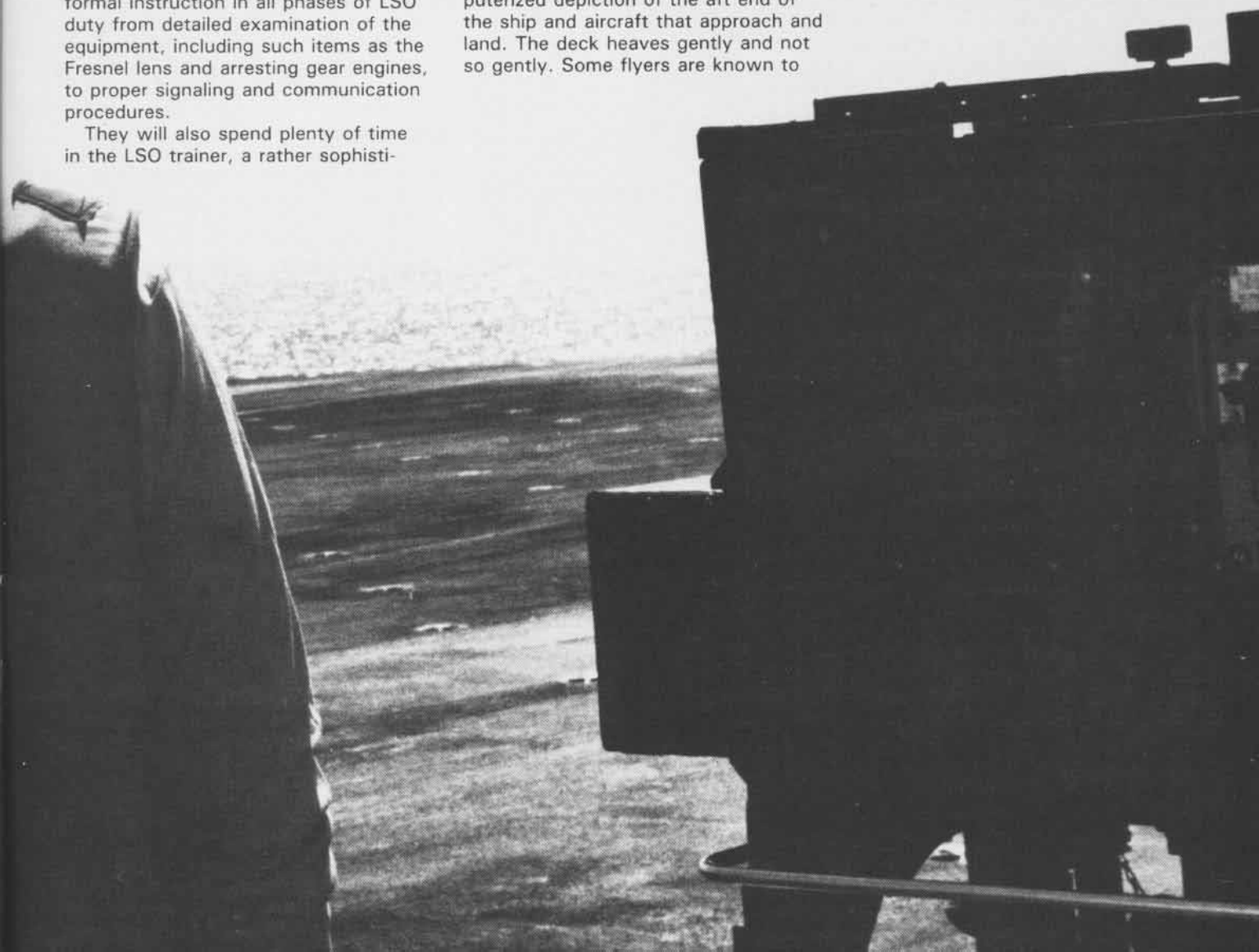
first-rate throughout the fleet. This is manifested in the carrier landing mishap rate, which has achieved historic lows, and in personal attributes characteristic of the typical LSO.

Lt. Baron Asher, VAW-117, and LCdr. Phil Grandfield, CVW-11 LSO, whose improbable tactical call sign is "Filthy," "wave" an E-2C Hawkeye.

Students at the LSO school are excellent examples. They are normally first-tour types who have already spent apprentice time on the LSO platform. They want to be LSOs. They are above-average performers all the way.

They are ordered to the school for formal instruction in all phases of LSO duty from detailed examination of the equipment, including such items as the Fresnel lens and arresting gear engines, to proper signaling and communication procedures.

They will also spend plenty of time in the LSO trainer, a rather sophisticated device consisting of a dome-like, darkened chamber which contains a simulated LSO platform and a computerized depiction of the aft end of the ship and aircraft that approach and land. The deck heaves gently and not so gently. Some flyers are known to have become a bit seasick within the dome. In the near future, new, state-of-the-art trainers will be operational, one each for West and East coast units. They will be located at NAS Oceana, Va., and NAS Miramar, Calif., respectively. These will further en-



"There is no other job that I'm aware of wherein you take on such great responsibility."

LCdr. Craig Cuninghame, OinC of LSO School.

JO3 Doug Gabos

hance LSO training and Paddles' ability to do the job. The LSO school, by the way, will be moved to NAS Oceana early in 1988.

Key to the curriculum are the briefings by Cuninghame and his staffers. Experience is the best teacher and these officers have it. Assistant OinC, for instance, is Major Tim Ghormley, the U.S. Marine Corps' "senior LSO." Because the recipients of the instruction are willing and eager to begin with, the instructor's task is less difficult than it might be for other audiences.

Here's a sampling of members of a September class at the LSO school:

Lieutenant Bob Ayres, VA-34, *Intruders*. He was "volunteered" for the school. "I didn't fight it, however. I look forward to the duty." He has 1,700 hours, 240 traps.

Lieutenant Greg Wallace, VS-24, *Vikings*. "I like the responsibility that goes with being an LSO. I like the challenge." He has 1,000 hours and 140 traps.

Lieutenant Mike Chandler, VRC-30, *Greyhounds*." I want the experience. An LSO becomes familiar with a number of aircraft. Also, I hope that being an LSO will enhance my chances of one day getting into the jet community." Mike has 500 hours, 75 traps.

Lieutenant Rob Hunt, VA-72, *Corsairs*. He said, "I like the idea of being deeply involved in carrier flying. Being an LSO contributes to that. I've wanted to be one since flight school." He has 500 hours and a 100 traps in the logbook.

Lieutenant Rusty Martz, VFA-151, *Hornets*. Commenting on the sacrifice to flight time that happens in the community because of unyielding commitments to duty on the platform, he said, "It's something you swallow. It's not a pleasant reality. You take it with the business. On the other hand, you become a better pilot due to the experience gained as an LSO. This is a good payback." Lt. Martz has flown 750 hours and has 85 arrested landings.

Lieutenant junior grade Robert Allen, VF-41, *Tomcats*. Said Allen, "The climate for learning here at the school is excellent. The professionalism is impressive." Allen has 800 hours and 100 traps.

Lieutenant Pat Leary, VF-142, *Tomcats*. On being an LSO, Leary said, "I enjoy being on the back end of the boat and just being a part of it. Watching airplanes come in. Trying to help them. It's great."

The majority of LSOs would presumably echo Leary's feelings. One student officer noted, "Others watch the landing process on the PLAT [pilot landing aid television] in the ready room. As LSOs, we are a step closer to the action."

When asked if they were prepared to handle a C.O. or some other senior officer who contests his landing grade, the collective response from students was, "There's not much you can do about that. You call them as you see them. Fortunately, such incidents are rare."

Because every landing is analyzed, graded and debriefed to each pilot, there is a competition among aviators in ready rooms aboard all the carriers. Virtually all squadrons keep a status board, annotated with the shorthand vernacular familiar to carrier aviation next to each landing.

"OK, 3," of course, reflects a perfect approach and landing. The pilot deviated slightly from the prescribed flight path, was on speed, and snagged the third of four cross-deck pendants, or cables, rigged across the landing portion of the deck. Said Lieutenant Commander Jack Ross, Chief of Naval Air Training (CNATra) LSO, "The perfect pass is tough to get and is usually achieved by only the very best aviators."

An "OK [not underlined] (SIC)" pass is excellent but the pilot "settled in close" a little on the final phase of the approach. "(OK) FAW," translates to "fair pass, fast all the way." Receiving a grade without the letters "OK," in or out of parentheses somewhere in the description is not desirable. The pass was below average. If a pilot were to consistently record such approaches, he or she would become the object of extra scrutiny and assistance. Students at the LSO school learn this long before they come to study in hangar 67 at Cecil Field because, above everything else, they must be excellent carrier pilots before assignment to the course.

Like big league umpires, LSO reputations can hinge on how they "call" the approaches. Most carrier aviators will agree, however, that the caliber of Paddles across the board is such that their comments are respected and accepted. This is another reflection on the truth that LSOs are above-average performers.

What are the most important characteristics an LSO must possess?

Lieutenant Commander Marty Allard is staff LSO for Commander Naval Air Force, U.S. Atlantic Fleet (CNAL). His purview includes all the Paddles in the CNAL organization. "The most important attribute," he asserts, "is the ability to keep cool under pressure. Secondly, he must have excellent eye-to-hand coordination. This means the ability to observe what an aircraft is doing in terms of the approach and to provide appropriate signals, or guidance, accordingly."

Commander Naval Air Force, U.S. Pacific Fleet (CNAP) head LSO is Lieutenant Commander Phil Grandfield.

He added two more qualities needed by Paddles: 'A good LSO must be a better-than-average carrier pilot. In order to see deviations in others, he must be awfully good himself. Additionally, and maybe it's part of what I have just described, he must have credibility. He has got to be able to get aboard consistently — and consistently well — himself."

LCdr. Cuninghame holds discussions at the school on the various aircraft in the Navy-Marine inventory and how they behave in the landing pattern. "The 'Whale' is the most difficult plane to wave aboard," he admitted. "Not only because of the size of the A-3 but because the *Skywarrior* does not enjoy the newest technology with respect to flight control systems."

Continued Cuninghame, "At the other extreme is the *Hornet*. "It's a piece of cake. I must quickly add that 'coming aboard' is never a simple matter but, from a pilot's and an LSO's point of view, the F/A-18 is the easiest to fly aboard as well as the easiest to wave aboard."

The F-14 has had some carrier landing problems and is the subject of much discussion throughout the LSO community. Said Cuninghame, "Lineup is especially critical in the *Tomcat*, particularly due to its wide wing span. Its turbofan engines make power response critical. If power is reduced and suddenly needed, the pilot must be careful."

The *Viking* is considered relatively easy to wave and has an extremely high boarding rate (fewer bolters and waveoffs than most other aircraft) but can be one of the most difficult from the pilot's standpoint to get aboard correctly. An LSO might be a bit lenient in allowing an S-3 pilot to deviate from the glide path because the comparatively slow speed of the airplane permits time for corrective action. The LSO school cautions against giving excess leeway to any aircraft in the groove. The *Viking* also has excellent fuel capacity and thus seldom runs low. This enhances the S-3's overall ability to get aboard.

Other carrier aircraft have their idiosyncracies. It is the LSO's job to know them. The school focuses attention on these. But it is just as important that he know the human being in the cockpit, his tendencies, his shortfalls, his strengths. In the close-knit fraternity of deployed carrier air wings, LSOs become quite familiar with the skills and capabilities of the flyers within their own units and in other outfits as well.

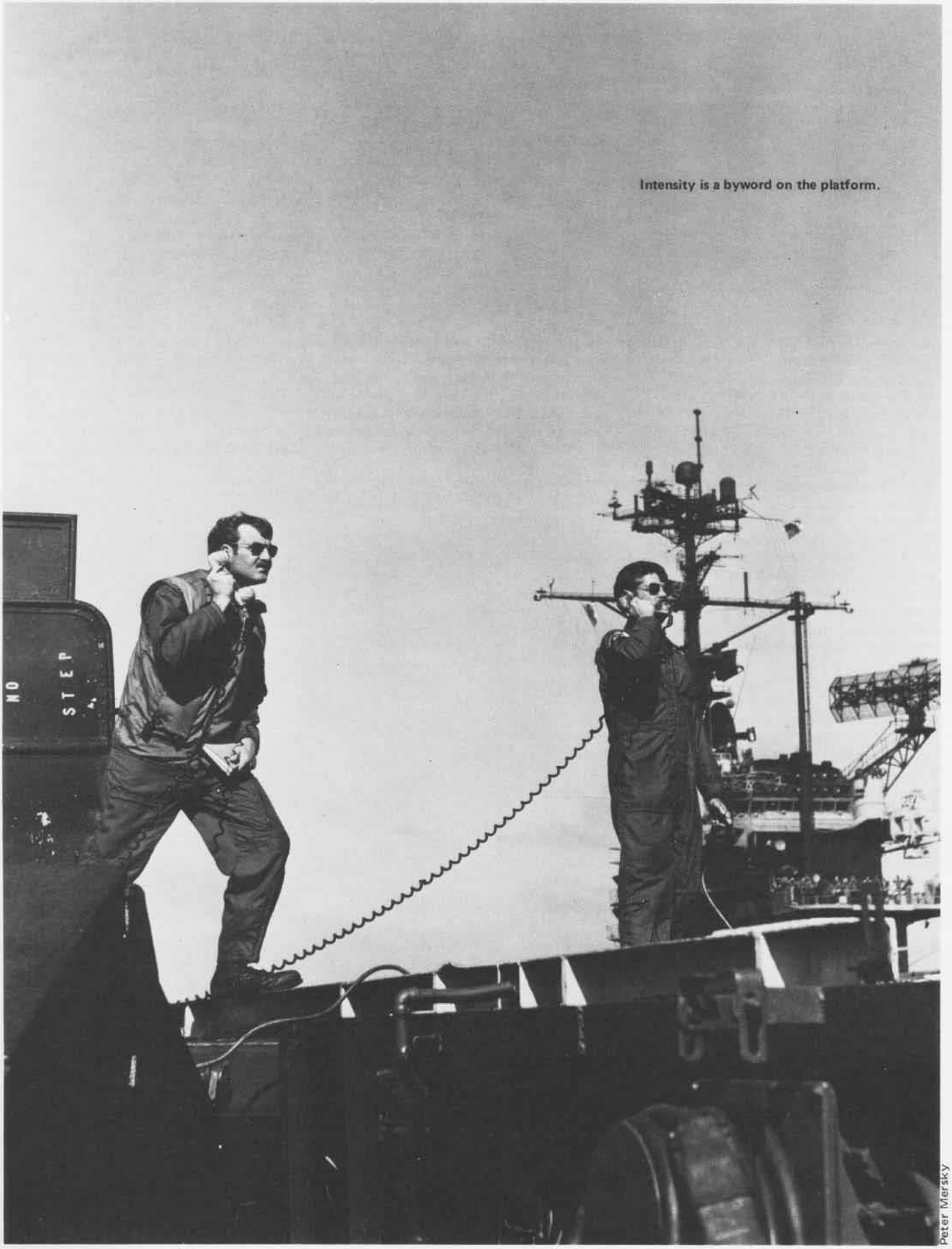
The LSO school is actually a second step along the career path of a typical LSO. The first usually is apprentice duty alongside the squadron and air wing Paddles during the pilot's first cruise. Ideally, the preparatory period encompasses a good part of, if not the entire, six or seven-month deployment. The LSO school would follow and after that the newly trained Paddles returns to his squadron where he becomes eligible for "CAG team duty." Typically, air wings have two LSOs on the staff and five to seven teams of LSOs comprised of squadron Paddles. Each team serves a 24-hour watch. Thus, an LSO can expect duty once every five to seven days. He may be able to fly during the 24-hour watch. Importantly, apart from team duty, he will usually be on the platform on a daily basis when his squadron has aircraft scheduled for recovery, to increase his exposure to the landing environment.

The subsequent shore duty assignment for an LSO would be in a fleet readiness squadron or a training command unit. After this, the officer could likely be assigned as an air wing LSO. Except for the small handful of officers who achieve the CNAL, CNAP, and CNATra LSO jobs, not to mention the OinC's position at the LSO school, it is unlikely that the LSO will do any more waving after the air wing assignment. By this time, he has been groomed for a department head job in a squadron. In effect, the LSOs peak at the lieutenant commander level. The experience gained as Paddles, however, remains and contributes for years to the officer's professional development.

CNATra's LCdr. Ross may be on shore duty, but he goes aboard USS *Lexington* and other carriers 10 times a year for student carrier qualification periods that last 10 to 13 days at a stretch. A *Viking* pilot with 2,400

LSO in flight gear guides A-7 Corsair.

Peter Mersky



Intensity is a byword on the platform.

Peter Mersky

hours and 300 arrested landings, Ross has also served as Carrier Air Wing Six LSO and as an LSO school instructor. He currently has 26 LSOs under his cognizance throughout the training command complex. They are assigned to five A-4 *Skyhawk* and four T-2 *Buckeye* squadrons.

"The small cadre of LSOs in the training command has the immense task of introducing all Navy and Marine Corps jet student aviators to carrier aviation," explained Ross. "Also, CNATra LSOs get about 25 flight hours per month compared to other instructors who average 40 hours. When working with 30 students, which is common in T-2 *Buckeye* squadrons, there is so much FCLP [field carrier landing practice] work to do, coupled with the *Lexington* deployments, that it's hard for Paddles to match their flight time with contemporaries."

In FY 87, 1,100 fledgling] aviators qualified aboard the carrier in *Buckeyes* and *Skyhawks*. (Roughly 12 percent of the student aviators do not qualify.) The thousands of FCLPS that preceded these qualification periods give an indication of the tremendous workload that burdens LSOs in CNATra. There is no authentic FCLP without an LSO out at the approach end doing his thing.

LCdr. Ross pointed out that 33 percent of CNATra LSOs will stay in the Navy. The balance will answer the call to airline jobs or other civilian pursuits.

"There's not much we can do to substantially increase an LSO's flight time in the training command," said Ross. "But we have initiated a couple of programs to enhance morale. There's the LSO of the Year award, based on performance and other factors, and an LSO Landing Derby aboard *Lexington* with LSOs as the exclusive participants. Winners of each receive a free trip to the Tailhook Convention in Las Vegas held in September." Ross indicated that other programs are being reviewed to help LSO retention.

Ross said that "Opportunities for the career LSO achieving command billets are great." He added an interesting, if ironic, point relative to flight time: "Because LSOs usually have an air wing LSO assignment for their second sea tour (following fleet readiness squadron or training command duty), and fly during that assignment, they ultimately catch up and may even surpass their counterparts whose equivalent sea duty may be in a nonflying billet, such as catapult or CIC [combat information center] officer."

"In AirLant, there are 10 to 11 carqual deployments lasting about six days each, plus a few other short-term cruises," said LCdr. Allard. "My main concern is ensuring that training of the LSOs is up to speed. Regarding flight time, I believe that our first-tour LSOs are getting their fair share. C.O.'s are apparently making the effort to ensure that their Paddles are not short-changed."

Allard, an A-6 pilot formerly of VA-35 with 2,500 hours and 520 traps, noted an unusual dilemma with respect to LSOs as above-average performers. "Because they are top-notch," he said, "we lose some of them to Test Pilot School or Top Gun training — choice assignments."

CNAP's LCdr. Grandfield, whose fighter background includes 2,000 hours and 400 traps primarily with VF-21 and VX-4, stated that when it comes to fitness reports, "LSOs break out on top. They are strongly motivated officers."

Grandfield said, "There are a lot of late nights in the LSO business. It's the nature of the assignment. But, traditionally, the type of officer who becomes an LSO is willing to spend the extra time. He wants that responsibility."

It would be improper to discuss LSOs without some reference to the difficulties encountered during night carrier landings. LCdr. Cuninghame agrees that getting aboard in the dark brings the most perspiration to foreheads and other places. Insightful, though, is his notion that "To our detriment, I think, we talk about the night landings no end. We are quick to advise aviators to 'suck it up a little extra' at night. In some cases, we are excessive in such remarks and talk people into a wrong attitude. This is not to say we should downgrade the difficulties of night work."

In 1969, an analysis was conducted on "The Landing Signal Officer." While the information in it is far from current, the findings in the report remain, for the most part, accurate.

The report corroborated the unsurprising fact that LSOs work long hours. Eleven and 12-hour days were common and, on deployments, that figure jumped several hours above that.

Among the advantages of being an LSO were: having more than a fair share of responsibility early in an officers's career, respect of others, prestige, self-satisfaction, getting to know more aviators, and the increased chances of remaining in operational billets makes you a better pilot.

The perennial disadvantages are long hours (especially night work) and less flight time than others. Also listed was "limited chances for promotion." LCdr. Grandfield observed, "The perception has been that a CAG LSO tour hurts promotion opportunity because it is noncompetitive. There are only two officers ranked against each other. My experience has been different. I've seen plenty of C.O.'s who were ex-CAG LSOs. CAG LSOs have the opportunity to work for an air wing commander and with *all* of the squadron skippers. I don't see this as a disadvantage now."

Suggestions to improve the LSO's lot included providing incentive compensation. LSOs now receive $110-per-month flight deck hazardous duty pay. Exempting LSOs from watch standing and other duties was also recommended. There are no statistics available to indicate how many are, in fact, exempt from squadron duty officer, boat officer, and other watches. Overall, according to Grandfield, Ross, Allard and Cuninghame, there have been major improvements in this area on the part of squadron commanders. It is a matter foremost on the minds of LSOs, one that requires continuing and aggressive support from unit skippers.

Detrimental effects on the career of an LSO listed the "narrow experience and restricted career development." LCdr. Grandfield commented, "Other 'development' jobs like Postgraduate School, ship's company tours, etc., are most difficult to get nowadays. Pilots are so scarce that they are assigned cockpit jobs."

The report included criteria considered important in the LSO selection process. Reaction under stress, ability to instill confidence, motivation and aviation ability were key factors.

Why do some LSO trainees drop out of training? Lack of motivation is the principal cause, followed by "too much work," "didn't like waving," and lack of ability. Why do some trainees fail to qualify? Lack of motivation is the main reason. Poor perceptual ability and the inability to control aircraft properly/safely were next, followed by "poor reaction under stress."

There is no doubt that LSOs are among the hardest working individuals in carrier aviation. The self-satisfaction they experience is silent reward for their endeavors. The LSO school is only one element in the progression toward achieving that self-satisfaction.

For the time-tested Paddles, who has waved countless aircraft from first cruise as a nugget through the last one as an air wing Paddles, his operational experience has been enriched beyond measure and he will gain from that throughout the remainder of his career in the Navy. As for the junior lieutenant just getting started on the platform, LCdr. Cuninghame, declared, "There is no other job that I'm aware of wherein you take on such great responsibility and have such immediate impact on carrier operations." ■

Leadership on a Budget

The following remarks were made by the Honorable H. Lawrence Garrett III, Under Secretary of the Navy, at the Naval Aviation Luncheon in October 1987 at the Washington Navy Yard:

Capt. Dayton W. Ritt, C.O., USS Theodore Roosevelt (CVN-71), right, explains the use of an aircraft spotting board to Under Secretary Garrett.

I want to share with you some thoughts about where we are as a community and, from my perspective as the Navy's service acquisition executive, the uncertain sky that lies ahead.

You have every reason to be immensely proud of the performance of Naval Aviators around the world. Secretary [James] Webb has met with Navy and Marine aviation personnel from Korea to the Persian Gulf, sailors and Marines who are tough, dedicated and ready to meet any challenge. My own visits with fellow aviators since coming aboard in August confirm what I've always known — that our people are technically excellent, highly motivated and extremely well led. Most importantly, our forces know that the American people are with them. While enduring some of the most difficult conditions at sea our Navy has faced in many years, they have captured the attention and earned the gratitude of our nation.

The measure of excellence of American Naval Aviation is found not only on those rare occasions when it must be employed, but also day in and day out as naval operations proceed in the far reaches of our globe under an invisible, but unchallenged canopy of air superiority. While the cameras record our destroyers reducing Iranian radar platforms to rubble, you and I know that up there at 10,000 feet, the Ayatollah's F-4 pilots don't dare interfere because of a healthy disdain for op testing their ejection seats.

The challenges that lie ahead show no sign of diminishing. Secretary [of Defense Caspar] Weinberger recently stated that America would maintain its presence in the Persian Gulf until the Iran/Iraq war ended. Instability in the Philippines poses a serious threat to our strategic interests in the western Pacific. The signing and ratification of an intermediate nuclear forces agreement with the Soviet Union will undoubtedly place greater demands on our conventional forces in and around

"Now more than ever before our watchwords must be efficiency, integrity, innovation and leadership."

the central front, upon which we have designed and implemented an aggressive and forward-looking maritime strategy.

Within our general maritime strategy, specific problems require close scrutiny, driven, at least in part, by recent events. The Toshiba/Kongsburg affair and the massive Walker compromise have rendered antisubmarine warfare [ASW] our number one priority. If our seapower strategy is to succeed, our maritime patrol aircraft working in conjunction with our attack submarines must move at the outbreak of hostilities to find and destroy the enemy's submarines before they deploy into open water. Consequently, the Soviet submarines which survive to face the battle group will be the most difficult challenge imaginable for our ASW helos and S-3s. As a former TACCO [tactical coordinator], I appreciate the needs that have to be met in order to ensure success.

Our antiair-warfare capabilities will be increasingly tested as the Soviets follow our lead in low observable technology. To counter such advances, we must continue to make gains in radar, communications and early warning. In addition, our attack aircraft now face the challenge our own cruise missile capability has helped create by forcing our potential adversaries to improve their air defense capabilities. For example, contrary to what the public was told on the evening news following our attack on Libya, our pilots flew through one of the most intense antiair barrages seen in recent history.

Planned advances in the operating range of our amphibious forces require greater standoff capabilities in electronic warfare and over-the-horizon targeting. And the unusual demands of low-intensity conflict, clearly illustrated by the speedboat swarms in the Persian Gulf, place renewed emphasis on the attack capabilities of our helicopters.

As a consequence of these threat changes, and inspite of today's great fleet air capabilities, we are still faced with the pressing need to replace and revitalize aging aircraft and outdated technologies.

Our ASW needs will be met by a total replacement of our VP [patrol] forces. The P-3 *Orion* will be phased out in favor of the long-range, air ASW-capable aircraft [LRAACA], while the advanced tactical aircraft [ATA] or an ASW variant of the MV-22 *Osprey*, is brought in as a possible follow-on to the S-3 *Viking*. We may also have to modernize the inner-zone helo with a new low-frequency sonar.

The F-14D [*Tomcat*] will bring improved engine performance and avionics as well as *Phoenix* and *Sparrow* missile upgrades to the air battle. And we will continue to add significant numbers of F/A-18 *Hornets* and AV-8B *Harriers* to our inventories.

The ATA, follow-on to the A-6F *Intruder*, provides a quantum leap in technology that will completely change the face of our air attack capability and survivability. Our selection of the ATA underscores a determination to make our procurement decisions with an eye to the future.

New air-to-ground weapons, the advanced interdiction weapons systems and the *Harpoon* shore/land attack missile, will vastly improve our standoff ability, increasing the security of our carrier battle groups and amphibious assault forces.

The MV-22, a tilt-rotor, medium-lift, vertical takeoff and landing assault aircraft, which represents fully 20-percent of the aviation budget, will enhance the maneuverability and operating range of the battalion landing team.

All of these programs rest squarely on agreed requirements. Introducing these new systems and technologies may mark the difference between success or failure in meeting our objectives across the broadest spectrum of conflict. While our commitments seem always to increase, the specter of diminishing resources presents the greatest challenge the aviation community will face in the coming years. The enormity of this challenge cannot be underestimated. It represents a serious threat to readiness, morale, proficiency and the ability to meet our obligations.

Our programs are not padded nor are they based upon unreasonably optimistic growth projections. Traditionally, Navy spending for a given current year represented roughly two-thirds of what had been projected for that year in earlier five-year defense plans. Faced with the severe competition for required resources, the out years in the current five-year defense plan are lean. Moreover, our programs were built upon a modest projection of three-percent real program growth. Even so, the impending fiscal environment will simply not support our current plans. Under pressure generated by recent events on Wall Street, and in light of a congressional decision to revitalize the Gramm-Rudman deficit-reduction process, we will in all probability be forced to make budgeting decisions in a climate of diminished resources.

The unique nature of aircraft procurement, with its discrete units of short delivery times, makes it a favorite target of budget cutters. Some of the cost-saving measures normally employed to avoid cuts in procurement, such as stretchouts, won't begin to solve the impending problem. We anticipate about 1.5 billion dollars in cuts at the near end of the five-year defense plan and 3 billion dollars in cuts at the far end.

The search for opportunities to effect savings of such magnitude must be managed with careful attention to impacts upon our capital assets and our people. To fulfill our maritime strategy, we must maintain a minimum of 15 active carriers at all times. For each of the five carriers at sea, we must have one in maintenance and a second in workup. Were two carriers to be retired early, as had been suggested by some in the congress, our remaining carrier battle groups would have to stay at sea longer with less maintenance, and the effect on retention and readiness would be enormous. Surely this is false economy.

Even if our 15-carrier force is preserved, the grim fiscal future facing the five-year defense plan will remain. Consequently, many of you are about to face the greatest leadership and management challenges of your careers.

Those of you tasked with budget and procurement decisions must devise innovative methods of getting maximum war-fighting value for every tax dollar. None of our programs will be immune from reductions. Our priorities must be even more carefully established with a view towards long-term impacts and capabilities. In practical terms, that means fewer flight hours, fewer spare parts and a slowdown in modernization. Those of you in the fleet will have to draw on your best leadership and management skills to meet mission objectives while maintaining high morale.

We all know that leadership is made easier when times are good and new aircraft continue to arrive in the fleet. The years ahead will, I fear, mark an era of extremely tough times. The time to begin thinking about how we can best meet these challenges is now. It's important that our people understand the magnitude of the challenge and set about to master it.

My purpose is not to paint a picture of impending disaster, but simply to provoke your thoughts. We have the talent and the dedication to develop solutions. Most importantly, we have the best people in the world. Now more than perhaps ever before our watchwords must be efficiency, integrity, innovation and leadership. As we work together in the months ahead, I challenge you — individually and collectively — to renew your commitment to maintain the finest naval fighting force in the world. ■

Condensed from article in U.S. Naval Institute *Proceedings,* August 1984

The Empty Cockpit

U.S. pilotless aircraft have been around in many configurations over the past seven decades. Doctor Edward Teller, father of the nuclear age, said, "The unmanned vehicle today is a technology akin to the importance of radar and computers in 1935."

By Commander Daniel M. Parker

Never send a man where you can send a bullet, said Sam Colt, 19th century inventor and firearms expert. A 20th century variation of this might be "Never send a man where you can send a remotely piloted vehicle."

Since about 11 years after Wilbur and Orville Wright made their historic flight at Kitty Hawk, N.C., in 1903, there have been RPVs. Their use, however, has been relegated in most instances to that of target drone. Only recently have they interested military planners because of their expanded capabilities: a degree of miniaturization that allows highly advanced sensors to be packaged into a small weight and size; and low cost, as an alternative to increasing costs of major weapon systems.

The increasing potency of threat weapons has generated a need to reevaluate the use of our scarce, high-cost military resources in a high-threat environment. Because of its relatively low cost, high survivability based on small size, inherent flexibility, and capability developed through state-of-the-art technology, the remotely piloted vehicle has become most attractive for expanded military application.

A Long History: The U.S. Navy first attempted to employ pilotless aircraft in 1917 when Glenn H. Curtiss was contracted to deliver a pilotless biplane for use as an aerial torpedo. Although the "flying bomb" was not controlled from the ground, the gunner's objective was to judge the distance to the target and set the engine to run until the desired point was reached. At the preset range, the engine was supposed to stop and the wings fall away, allowing the fuselage to drop onto the target.

Economic restraints occasioned by the end of WW I essentially ended U.S. development of RPVs. Meanwhile, across the Atlantic in Great Britain, work continued at a steady pace. On September 3, 1924, a pilotless biplane with full radio control flew from the deck of HMS *Stronghold.* Although the flight ended after only 12 minutes because of engine failure, it was the first true RPV.

Thereafter, British development of pilotless airplanes scored success after success. Their aircraft were designed to fly 300 miles. In July 1927, one of the aircraft launched from *Stronghold* successfully flew the full length of a course over the sea off the coast of Somerset, Devon and Cornwall. From then on, British RPV development was directed solely at perfecting a target drone for firing practice. Spurred on by the debate between the Royal Air Force and Royal Navy about the vulnerability of capital ships to attack by aircraft, the Air Ministry contracted for a radio-controlled target aircraft specifically for simulated attacks against the fleet. In January 1933, a drone accompanied the Home Fleet during its spring cruise to the Mediterranean. The pilotless aircraft is said to have survived more than two hours of concentrated gunnery before being recovered safely.

Gyrodyne Company

Above, a 1960s drone ASW helicopter. Opposite page, a WW I flying bomb biplane.

In the United States, the ancestor of modern U.S. RPVs was being developed in Hollywood! Actor Reginald Denny's nine-foot-span model airplane was offered to the U.S. services as a target drone to replace the more expensive *Tiger Moth* biplanes used in prewar fleet exercises. Suddenly, in 1942, the United States found itself engulfed in WW II, and a new impetus was generated for these minature target drones. By war's end, almost 14,000 drones had been delivered to the U.S. Army and Navy.

RPV development in the U.S. went into remission again following WW II, until the intelligence-gathering needs of the late 1950s and early 1960s stimulated a resurgence of effort to fill the gap caused by the inadequacies of manned aircraft.

Although the urgency of the need was not enough to provide RPVs for immediate use, they were ready by 1964 for service in Vietnam. Between 1964 and 1965, more than 3,435 RPV sorties were flown over Southeast Asia. Missions included photoreconnaissance, electronic intelligence gathering, bomb damage assessment, psychological warfare (propaganda leaflet dropping), and electronic warfare. While nearly 5,000 U.S. airmen were killed in Southeast Asia, RPVs allowed their "pilots" to return safely from each mission. Not only did RPVs save lives but, with their use, the political ramifications of captured aircrews were avoided.

Battlefield Integration: Today, tactical RPVs have been proving their mettle in hostile environments almost daily. Integration of RPVs with tactical strike aircraft played a major role in Israeli successes against Soviet-made air defense systems in Lebanon. As far back as 1973, the Israelis employed harassment drones during the 1973 Arab-Israeli War to saturate enemy air defense systems and allow strike aircraft to attack Egyptian surface-to-air missile (SAM) sites while they reloaded.

Most recently, Israeli success in destroying Syrian SA-6 sites has been directly attributed to their use of RPVs. While low-flying RPVs, configured "electronically" to resemble aircraft, kept Syrian gunners occupied, higher flying reconnaissance aircraft photographed SAM firings and collected data.

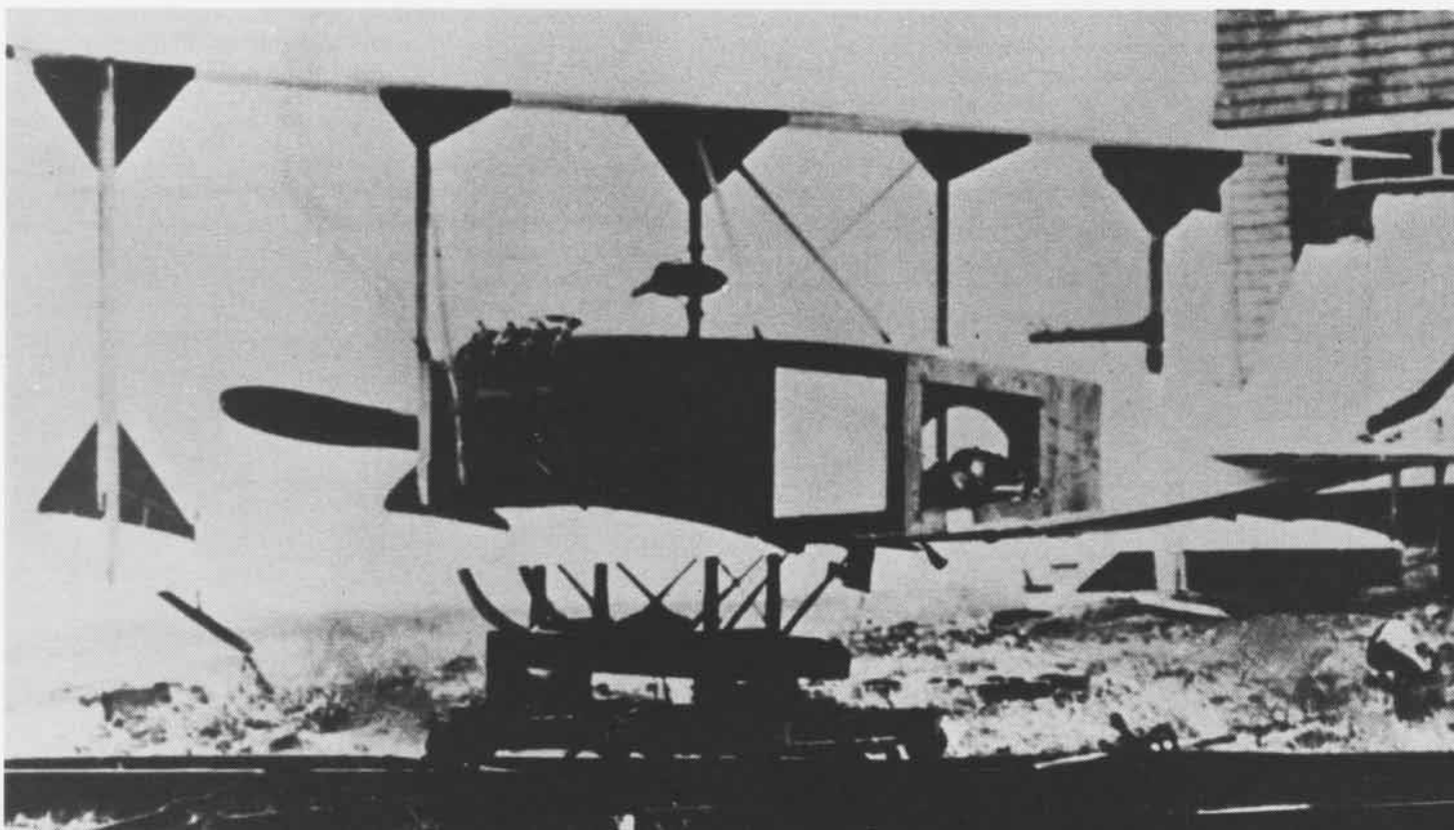
RPVs also furnished combat commanders with near real-time tactical reconnaissance. Equipped with electro-optical sensor packages and digital data links, RPVs provided imagery of enemy positions and even enemy fighters positioned on runways for takeoff. Equipped with zoom magnification, high-resolution imagery was projected on screens overlayed with maps of Lebanon to give battlefield commanders a complete picture of the fighting. Because of their small size and low infrared signature, the RPVs were virtually immune to hostile fire.

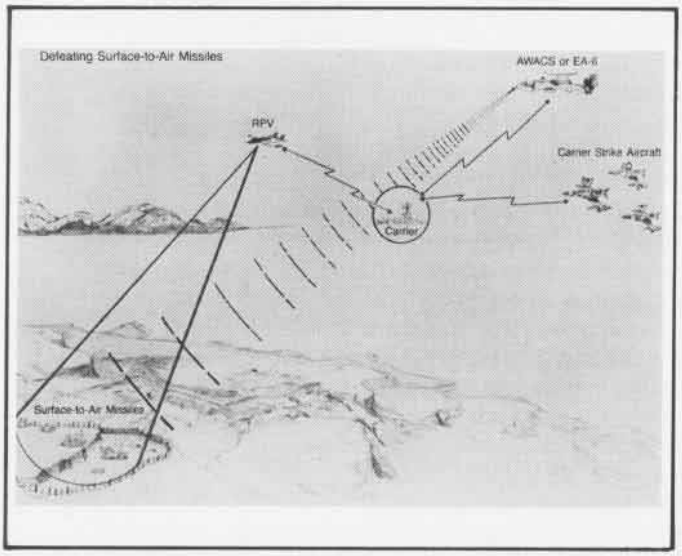
Applications to Naval Warfare: The Navy recently procured an Israeli-designed and produced RPV system for naval applications. In testimony before a congressional subcommittee, Chief of Naval Operations Admiral James D. Watkins indicated that the Navy was procuring the reconnaissance drone as well as drones for other purposes.

The greatest rewards for near-term RPV development lie in their use in augmenting current tactical aircraft (TacAir) assets and in integrating their capabilities with other battle group platforms. The secret is to develop specific vehicles for specific missions. In addition to basic control data links, each vehicle might include the following capabilities: intelligence/reconnaissance, harassment and electronic warfare.

Whether operating as part of a carrier battle group, amphibious ready group or surface strike group, a squadron of RPVs finds application in every mission area, some examples of which follow.

Antiair warfare. Most effective in a low-threat AAW environment, RPVs could be used in coordination with fighter aircraft or alone. Working in consonance with combat air patrol (CAP) aircraft, RPVs could visually identify threat aircraft while the CAP aircraft stay outside the range of threat weapons and remain ready to engage at the first sign of hostilities. In the absence of battle group air assets, the remotely piloted vehicles could be used for the same identification procedure. This would allow greater time for weapon release decisions and reduce the possibility of inadvertent friendly-versus-friendly engagements. Another benefit in the AAW arena could be to establish an airborne positive identification zone to visually identify friendly aircraft returning to the force, thereby reducing friendly losses.





Antisurface Warfare. Probably the most difficult aspect of antisurface warfare is detecting and localizing threat surface platforms before they can bring their weapons to bear, whether these weapons are antiship-capable missiles or simply ship gun systems. Carrier battle group TacAir assets providing long-range surface search work well in this mission. However, an RPV equipped for both day and night surveillance could prove powerful in over-the-horizon targeting. With continuous contact maintained on the threat platform, *Harpoon*-equipped surface shooters could stand off in virtual electronic silence and be ready to engage on command.

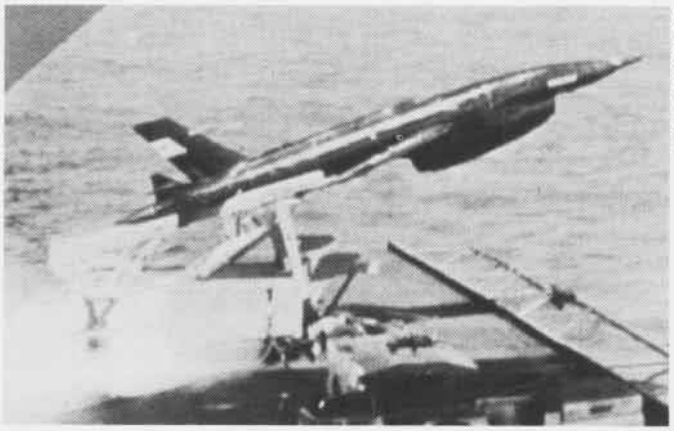
Operating in coordination with an aircraft war-at-sea strike, a combination of reconnaissance, harassment and electronic warfare RPVs would improve the chances of a successful attack. While the reconnaissance RPV would be positioned to positively identify the target and provide laser designation at the last minute for smart standoff weapons, harassment RPVs designed to electronically simulate friendly aircraft could attack various ships' radars, disrupting command and control on board the target, and create confusion long enough for air-launched *Harpoon* and antiradiation missiles to find their targets.

Strike Warfare. Strike warfare encompasses the ability to carry out offensive naval operations against targets ashore. This capability resides with TacAir from the carrier battle group and with amphibious forces. RPV augmentation for this area of naval warfare could provide excellent dividends. RPVs operating from surface platforms safely out to sea would provide a near real-time reconnaissance picture of SAM placements, lucrative targets, bomb damage assessment, and even hostile air reaction from opposing airfields. Controlled and relayed through an airborne early warning aircraft, information could be presented directly to the force commander on board his flagship. With the addition of harassment RPVs specifically designed to operate against known SAM sites, coordinated TacAir strikes against selected targets would ensure maximum battle damage at the lowest cost to friendly assets.

RPVs could also augment naval gunfire support for amphibious landings. In addition to providing a last-minute photographic update of the objective area, RPVs could provide laser designation of targets for laser-guided projectiles. Thus, RPVs could furnish pinpoint accuracy for targeting.

Antisubmarine Warfare. RPVs designated specifically for ASW operations could expand the flexibility of our ASW forces. RPVs designed to carry a limited number of sonobuoys could lay patterns and then climb to altitude and relay any information from the sonobuoys directly to the ASW module on board ship for processing. In a hot war scenario, an RPV equipped with a single torpedo could also be kept on station for urgent attacks if required; or, the on-station RPV could be used in coordinated operations with ASW aircraft and helicopters. Designed to notify other ASW assets when sonobuoy activity is detected, the RPV could monitor the sonobuoy patterns layed by other aircraft while they operated in separate areas, concentrating on electronic support measures, radar or visual search.

Intelligence and Command and Control. An RPV equipped with remotely operated communications and signals intelligence monitoring systems could fill a void when national sensors were not available. These RPVs would simply relay all data received directly to monitoring stations on board ship for analysis and interpretation. In addition, RPVs equipped with simple devices such as a radio relay capability could add to greater command, control and communications flexibility for the entire force. Such a nonurgent capability as communication by ultrahigh frequency over the horizon with other units could be accomplished at almost any time. ■



Teledyne Ryan

RPVs like this one launched from USS Ranger (CVA-61) on a photo-reconnaissance mission during the Vietnam conflict were very successful. In only one year, more than 3,400 sorties were flown over Southeast Asia.

Teledyne Ryan

A Vietnam veteran remotely piloted vehicle.

RPVs

A Source of Real-time Intelligence

By JO2 Julius L. Evans

The Intruder launched from the deck of USS Ranger (CV-61), piloted by its young lieutenant, who was assisted by his lieutenant junior grade bombardier/navigator (BN). The aircrew knew the importance of their mission and were eager to locate their target and return south of the demilitarized zone.

The black, stormy atmosphere of the early morning flight concealed the aircraft from ground observers, but the sky made the mission neither more difficult nor more comforting. The Intruder was well-equipped to fly low-level missions in adverse weather conditions, but the nature of the aircrew's mission made the two flyers uncomfortable.

Forty-five minutes into the flight and 15 minutes into enemy territory, the A-6 closed in on its target. The BN readied his "ammunition" as the pilot advised him of the estimated time of arrival above the well-concealed prisoner of war camp they were sent to locate. The BN squeezed the release on the 35mm camera's shutter, photographing everything that would help pinpoint the location where American POWs were being held captive.

Two-and-a-half hours later, after a successful flight, the young aircrew reflected on the potential danger that their mission had held. The information they gathered could have been, in reality, either helpful or useless in rescuing captured Americans. In either case, the jeopardy the two pilots faced might have been avoided with the use of remotely piloted vehicles (RPVs).

The Navy and Marine Corps are undertaking extensive operational testing of RPVs both at sea and on land. RPVs are not a new concept. They made their military debut in the early 1960s (see "The Empty Cockpit," page 12).

"RPVs were used during Vietnam but the military didn't achieve the potential results because the system lacked maturity," said Marine Major J. M. Yencha, Navy and Marine Corps remotely piloted vehicle project coordinator in the Office of the Chief of Naval Operations. "Eventually, the cost and performance of RPVs led the Navy to cancel the program." It wasn't until 1983 that new interest was generated.

"Secretary of the Navy John Lehman, the Chief of Naval Operations and several other high-ranking officers were made aware of how the Israeli government used the RPV and realized its potential," said Navy Captain P. E. Mullowney, Naval Air Systems Command (NavAirSysCom) unmanned air vehicle project manager. "As a result of a demonstration proving the RPV's capabilities, NavAirSysCom was directed in July 1985 to implement a program using off-the-shelf technology

AAI Corporation

A rocket-assisted takeoff boosts a Pioneer RPV to an altitude of 160 feet and airspeed of 80 knots within two seconds.

that would enable an RPV unit to be deployed to the fleet, as soon as possible, for intelligence gathering," he said.

In order to find the most effective and efficient technology, competitive tests were conducted from October through December of 1985, which concluded that the Israeli-built *Pioneer* unmanned air vehicle was the best for the Navy's needs.

With a 26-hp engine and a gross weight of 419 pounds, the *Pioneer* reaches a maximum speed of 115 mph. It maintains a cruise speed of 92 mph with a payload of 100 pounds at an altitude of 15,000 feet for eight hours.

Though it is small, with a wingspan of 16.9 feet and a length of 14 feet, the *Pioneer* system is capable of providing real-time reconnaissance and intelligence data via high-quality video imagery. It has a built-in removable, gimballed MKD-200 high-resolution daylight TV camera, which is interchangeable with the MKD-400 forward-looking infrared camera, a night imagery device.

The *Pioneer* offers the Department of the Navy the opportunity to achieve tactical goals that, in the recent past, have been unattainable. "The situations that we have been involved in, such as Grenada and Lebanon, and some of the operations now, require intelligence that we'd normally gather with manned aircraft," Capt. Mullowney said. "But in most cases, we are limited in our ability to use our manned assets."

The *Pioneer* can provide real-time imagery of troop movement, locations of antiaircraft guns or surface-to-air missile stations without the risk of losing manned aircraft. It can allow for close surveillance of threat areas or make damage assessment surveys. Field commanders will be able to gain real-time intelligence of conditions in an area that troops will occupy.

The heart of the *Pioneer* system is the ground control station (GCS-2000). This control center directs the RPV throughout the mission to its maximum range of 100 nautical miles (nm) from a mobile shelter. The GCS consists of three electronics bays manned by two operators.

A pilot bay includes all controls and readouts required for safe, effective operation. The observer bay provides control and display of the imaging payloads carried by the vehicle. The tracking bay displays the RPV position, using data obtained from the tracking and communication unit, which contains a jam-resistant, 185-kilometer (100 nm) range data link which enables the vehicle to travel relatively free of hostile electronic interference.

Launches, recoveries and preflights are controlled with the portable control station (external) that guides the craft to a maximum range of 25 nm.

With all that the RPV is scheduled to do, it is yet to be declared an operational system. "We say the system is not operational because we're still learning with it. But we do have the capability to support a contingency operation if the need arises," Capt. Mullowney said.

Maj. Yencha added, "We are learning more about the system each time we use it and that's the reason the Navy decided to place the RPVs in active units in both the Navy and Marine Corps. Operational units can learn more about the system and give the Department of the Navy the feedback so that we can make the changes which will make the system more compatible with fleet operations."

In April 1986, installation of the RPV system, including the internal and external control stations, began aboard USS *Iowa* (BB-61). A rocket-assisted takeoff capability was introduced as the battleship's answer to catapults and a net was designed for shipboard recoveries.

The unit was deployed aboard *Iowa* in December and completed five successful launch and recovery cycles. After a brief period of failures, the *Pioneer* proved itself again during a mini-cruise in January and February 1987. It also demonstrated its capability to support gunfire spotting during a 3.5-hour flight.

"A no-fly period of three months was used to solve problems we encountered aboard ship," Capt. Mullowney explained. "We resumed flying in April 1986, went back to the *Iowa* in July 1987 and have been flying ashore and afloat ever since. In the entire program, we have more than 600 flight hours and have flown more than 60 night hours."

In addition to the *Iowa*, several military units conduct operational experimentation in the RPV's capabilities. "We gave the RPV system to our test community and to some fleet units to let them start learning

AAI Corporation

AAI Corporation's robotics are designed to meet future technology demands in the development of sophisticated weapons systems. The Pioneer is one example.

from it and training with it to develop operational concepts and tactical doctrines," Capt. Mullowney said.

The Pacific Missile Test Center, Point Mugu, Calif., received the first RPV system in May 1986. Fleet Composite Squadron (VC) Six, NAS Norfolk, Va., has the Navy's primary RPV responsibility. VC-6 RPV Detachment One is currently operating aboard USS *Iowa*. The 2nd RPV Company, Camp Lejeune, N.C., was the first Marine Corps unit to receive the *Pioneer*. The Marines have plans for three RPV companies, each consisting of three platoons. Each platoon will have one RPV system, which includes the GCS-2000 with support gear, and air vehicles with sensor packages.

The 1st RPV Company of Twentynine Palms, Calif., was the second unit to receive RPV systems and was established after the 2nd RPV Company at Camp Lejeune. The 3rd RPV Company, also of 29 Palms, received its system in October 1987.

When the testing period is completed, the Navy will weigh the advantages of the short-range class of RPVs. "If the Navy's baseline decision is to keep the [*Pioneer*] system, then we will make changes based on what we learned in the fleet. After the changes have been incorporated and operated, we will do an operational evaluation to test them," Capt. Mullowney said.

If the Navy decides to stay with the *Pioneer* program, it will exercise a fixed-price option on the current contract that will enable the Navy to buy up to four more systems in FY 88.

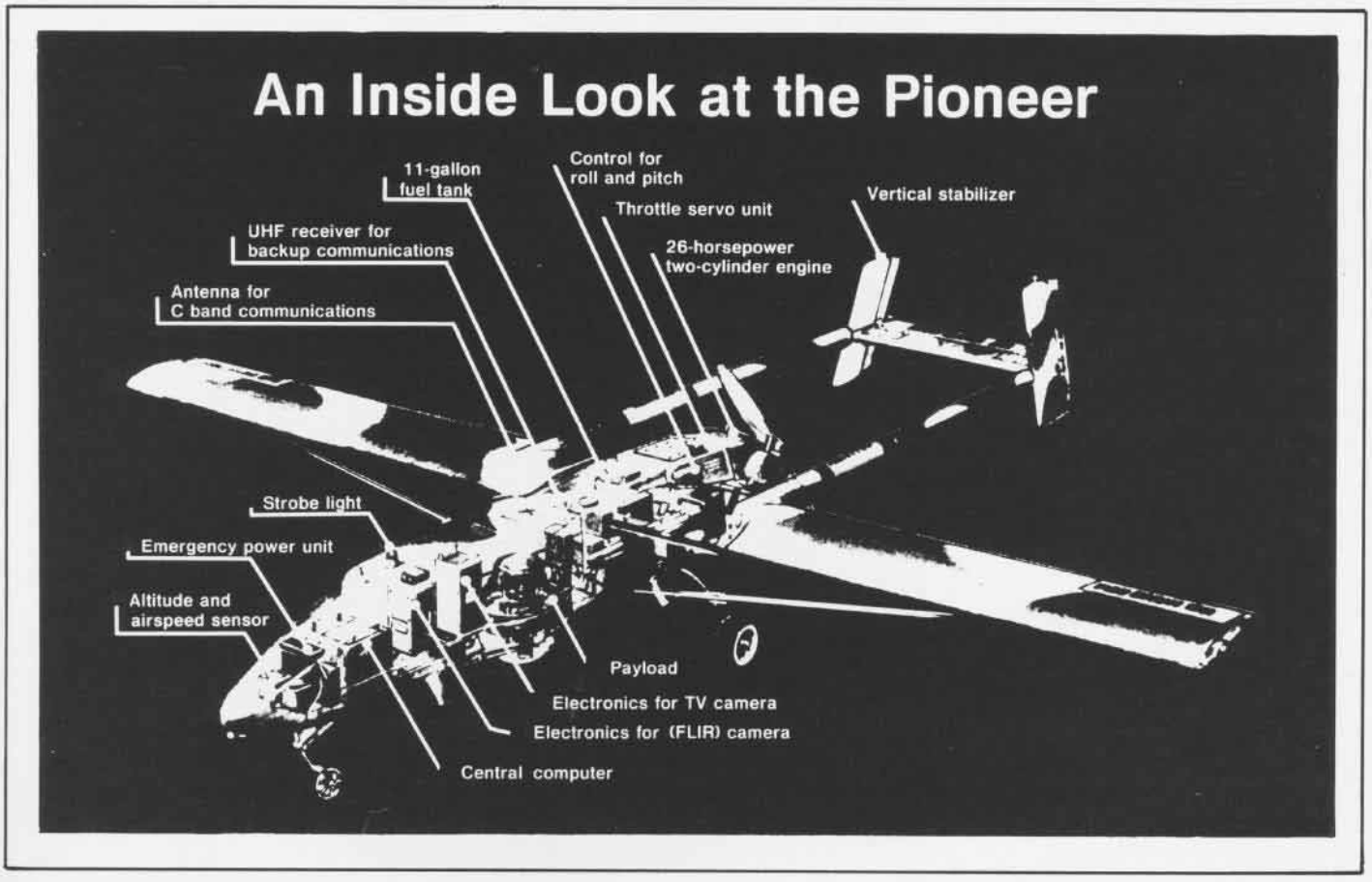
With all of the advantages that the RPV can provide, there are still a few problems which must but solved. "The Israelis are the experts in the RPV field, but their expertise is limited to land-based operations," Maj. Yencha said. "When you take this system to sea, you get a new variety of problems and your priorities change. The RPV's structure will have to be made to withstand the elements of operations afloat.

"You have to make and use the system at sea in different ways before you can even get to the requirements of a particular mission. We not only have to determine what we want the RPVs to do for us, we must first learn everything it is capable of," Maj. Yencha explained.

Capt. Mullowney agreed. "There are so many things we can do with the RPV that we must determine the operations we will perform with it and then limit ourselves to those operations, to prevent the rise of cost and complexity."

To date, the RPV program is a project that continues to make forward progress because of its unique capabilities and strong U.S. Navy and Marine Corps support. "We need the short-range program to fill the gap that the manned reconnaissance area was never able to give us. We need the mid-range program to augment manned reconnaissance. The RPV will be used to supplement manned reconnaissance, not replace man," Maj. Yencha said.

In an ever-changing world of technology where highly advanced systems give operators the advantage, the remotely piloted vehicle will give Naval Aviation a real-time view of how many steps the opposition must take to catch up. ■



HR2S-1W

One of the major Naval Aviation events anticipated in 1988 is the initial flight of the Bell-Boeing V-22 tilt rotor for the Marine Corps. A whole new range of rotorcraft capability will be introduced when the V-22 flies.

Thirty-five years ago, as 1953 dawned, a similar event was expected. The planned initial flight of a new helicopter, the Sikorsky XHR2S-1, would also represent a major advance in rotorcraft for the Marines. Not only was the HR2S the largest helicopter planned for Marine use, it also proved to be the world's fastest helo when first introduced into service. The combining of features such as twin engines and retractable landing gear were new to the helicopter world.

Like the V-22, the HR2S turned out to be a joint-services aircraft. The Army joined the Marines as operational users, and a special version was built for the Navy as an airborne early warning (AEW) helicopter, though it did not become operational. With the rapidly advancing helicopter technology of the era, particularly the introduction of turboshaft engines, the HR2S/H-37 was destined to be produced in limited numbers. Today it is little remembered, particularly as the major advancement in helicopters which it represented at the time.

The HR2S was one of the products of the Korean War, though it didn't reach service until long after the 1953 armistice. The Korean War was a great impetus to the operational use of helicopters, as well as to their technical development. Existing helicopters were ordered in greatly increasing numbers, while military planners explored new designs promising greater capability. The Marines saw that a helo larger than existing service types, and even most of those then being developed, would be a far more effective assault transport.

Requirements were established for a transport helicopter which would carry 26 combat-equipped Marines (two squads) or 10,000 pounds of cargo. Sikorsky was selected to build the new helicopter, its model S-56, a single-rotor design powered by twin P&W R-2800 engines, downrated to 1,900 hp. The engines were installed laterally in nacelles, with extension drive shafts running directly through the mounting "wing" stubs to the main rotor transmission in the upper fuselage. The pilot's cockpit was high in the nose, with clamshell doors directly below, opening into the large cabin. The five-bladed rotor folded, along with the tail, for storage aboard ship; it was limited to 68 feet in diameter for operations on CVE-class carriers still in the fleet.

Four XHR2S-1s were ordered in May 1951, with the initial flight of the first one in December 1953. Flight testing, including both Navy and Army evaluations, brought about many changes in the configuration. However, the overall promise led to an Army production order, as H-37As, along with orders for Marine production HR2S-1s.

Changes were made to improve aerodynamic characteristics, including increasing directional stability and reducing drag, while the engine

HR2S-1

HR2S/H-37

By Hal Andrews

nacelles were modified to improve the fan cooling for the air-cooled engines. Main landing gear changes included replacing the single wheels with smaller dual wheels. To improve performance, tests were made with a larger diameter (72-foot) main rotor. The improvement was significant and the change was approved for production, though at the expense of CVE operability. Two 300-gallon external fuel tanks could be carried, one mounted on each side of the lower fuselage, to increase the operating range/radius.

Initial production HR2S-1s came off the line beginning in September 1955, with the first seven in the 68-foot rotor configuration. These were used for initial BIS trials while the line switched over to the 72-foot rotor, beginning with the first Army H-37A in the summer of 1956. It was used for structural demonstration of the final configuration, the Marine 72-foot versions following soon after. In November, the potential of the new transport helicopter was suitably demonstrated: world helicopter speed and altitude records were set. The bulky appearance of the HR2S-1 belied the fact that it was the world's fastest helicopter — at 162.7 mph!

While development of the basic HR2S-1/H-37A proceeded, two examples of a modified version appeared in 1956, the HR2S-1Ws. Capable of carrying the weight of the large APS-20 AEW radar of the era, they were fitted with the necessary radome, making up the entire forward fuselage section under the cockpit in which the radar antennas could rotate. One of these was unfortunately lost in height/velocity power-off landing tests at the Naval Air Test Center, Patuxent River, Md., but this was not due to any deficiency of the basic design. However, the idea of operating AEW helicopters with a fleet at sea would wait until the British Royal Navy, without fixed-wing carriers, would find them essential as a result of its Falklands operations.

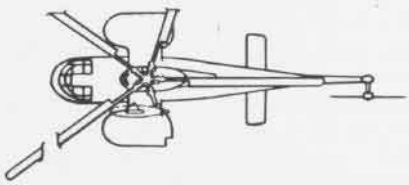
In 1957, following operational trials by HMX-1, squadron deliveries commenced. The first went to HMR(M)-461 at MCAS New River, N.C., in March. Production continued at Sikorsky, intermingled with the Army H-37As. A total of 55 HR2S-1s were delivered for the Marines, the Army getting nearly twice that many H-37s. With improved systems, including autostabilization, they were designated H-37Bs. Production of S-56s ended in 1960.

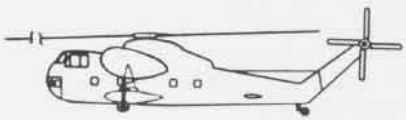
The HR2S-1s continued as the "heavy lift" assault transports of the Marine air wings into the 1960s. In 1962, they were redesignated as CH-47Cs, though still referred to as "Deuces" when they went to Vietnam in September 1965. There, they served "at war" until retired by H&MS-161, Sub Unit 1 in the spring of 1967. In the meantime, HMH-462 had phased out the last stateside CH-47Cs a year earlier as the turbine-powered CH-53As took over.■

XHR2S-1

HR2S/CH-37

Rotor diameter	72'
Length (over rotors)	88'
(folded)	58'5"
Height	22'
Engines	
Two P&W R-2800-54	2,100 hp
Maximum speed	121 kn
Service ceiling	11,500'
Range (external tanks)	335 nm
Crew/Passengers	
Two pilots/20 combat troops	





FACSFac VaCapes

By Commander John A. Norton

Photos by JO1 Jim Richeson

The USS *Coral Sea* ready rooms were coming alive. Shortly after breakfast, those flight crews lucky enough to draw an aircraft for the fly-off checked their assignments. Within a few hours, they would touch down at home after their final workup before deployment.

A hundred miles west, at NAS Oceana, Va., the gunner from Fighter Wing One finished reviewing the aircraft status boards. Mentally, he selected the two aircraft that Fighter Squadron 33 would fly in a short-notice missile exercise later in the day.

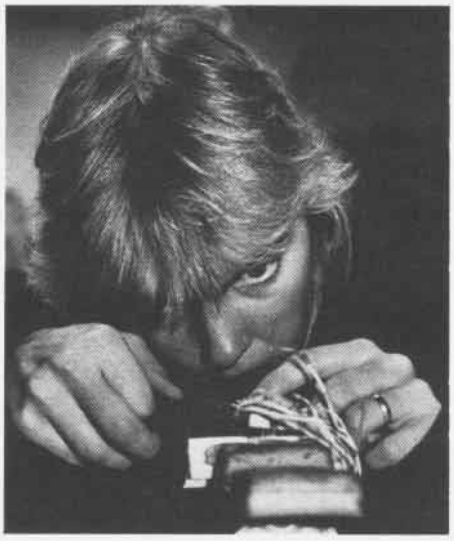
As the P-3 passed 8,000 feet, NAS Brunswick departure control handed it off to Boston Center. The tactical coordinator compiled the crew's, and completed his own, post-takeoff checks. He hoped the actual sonic conditions forecast for his operating area were better than predicted.

Over Providence, R.I., some of the *Orion's* tactical crew catnapped, while in Norfolk, Va., a Carrier Airborne Early Warning Squadron 124 crew briefed their mission in support of the missile shoot: "Expect Air Force aircraft from Langley. They should be doing ACM near the TACTS range; the shooters will be at one zero thousand."

Meanwhile at Wallops Island, NASA engineers put the final touches on the launch of a *Vandal* missile. Later that day, five ships steaming off the Virginia coast would attempt to shoot the Mach-2.2 missile out of the sky.

Orchestrating these and some 200 other events on a daily basis is a small command with a giant mission. Known to most fliers by its call sign "Giant Killer," it is the Fleet Area Control and Surveillance Facility, Virginia Capes (FACSFac VaCapes). Located in an open field just north of NAS Oceana, FACSFac VaCapes is dominated by two large, bulbous towers. The towers overpower the landscape and provide a false impression that this command's responsibilities are limited to the horizon reached by the radar within the domes. It is beneath those towers, in a low, easily overlooked building, where a handful of officers and enlisted watch teams convert the air, surface and subsurface training requirements for the fleet into a schedule. Then, in real time, they monitor and control the safe execution of that schedule.

Virginia Capes is a misnomer for this FACSFac. Its area of responsibility covers over 94,000 square miles, stretching from just south of Nantucket Island to Charleston, S.C., and extending from the three-mile limit eastward for 200 miles. Demands for use of the airspace which it controls come from all branches of the military and various government agencies. The requirements far exceed the physical limitations of the military operating areas to safely absorb the multifaceted



requirements.

For nearly 30 years, the Navy has recognized the need to manage its operational training and testing areas. First conceived in 1959 as a result of a study of San Diego's offshore operating areas, the FACSFac concept was originally implemented in 1964 at San Diego and has subsequently been expanded to Jacksonville, Fla; Barbers Point, Hawaii; and Oceana, Va. These facilities control over a half-million square miles of military operating, warning, and restricted areas.

The Navy's ability to control the airspace is subject to encroachment by various factions. A delicate balance must be maintained between the inherently hazardous nature of military operations and the legitimate requirements for commercial and recreational use of the same space. The Navy's approach has been to coexist with the divergent groups. At the center of that policy and ensuring that balance is maintained are the FACSFacs.

FACSFac VaCapes is manned by nine officers and 141 enlisted personnel. Air controllers and operations specialists implement the daily schedule while electronic technicians, data systems technicians and interior communications electricians maintain the vast array of radars, radios and computers which are at the heart of the operation. The FACSFac Air Control and Tracking System (FACTS), is a computer system which displays to the operator multitarget positional information drawn from various external sources. It integrates inputs from radars, beacons, Link 11 (data link) and various other sources, processes it and presents it to an operator on a four-color cathode ray tube in a near real-time presentation. Supporting the FACTS system are remote surveillance radars located in Suffolk, N.Y.; Trevost, Pa.; Fort Fisher, N.C.; and Oceana. Additionally, the system can accept and hand off data compatible with the Federal Aviation Administration's (FAA) National Airspace System, which significantly reduces cumbersome and time-consuming communications in the high-traffic environment.

The control center is located in a large open bay. FACTS computer terminals encompass half of the bay and are manned 24 hours daily by three watch teams. Background noise

Left, ET3 Barbara J. Rowell performs some needed repairs on a GRT22 Linear Power Amplifier. Below, ET3 Raymond A. Lannigan maintains the facility's UHF receivers.

from the air conditioning unit and computers seems loud, but personnel can talk in whispers and be easily heard. There is a serene sense about the control center which belies the intense activity behind the computer screens.

AC3 Darlene White is at the center of the room. She is this shift's facility watch supervisor. Around her, 14 other air traffic controllers of her team monitor and coordinate the activities on today's schedule. Each member controls a sector under FACSFac VaCapes' responsibility. The workload is light this day, by most standards, and she sits relaxed; the flow is working well. "If something is wrong, I can hear it in the controller's voice," she said.

Although nothing is amiss today, Petty Officer White has at her fingertips the knowledge and resources to remedy almost any conflict. There are hotlines to Boston, New York, Jacksonville and Washington FAA en route air traffic control centers, as well as various terminal facilities along the East Coast. She is trained and qualified at every controller's sector and understands the contents of some 20 letters of agreement with various government and military agencies. These agreements facilitate the safe coordination of aircraft within FACSFac airspace.

Typical of the agreements is one with the FAA called the Severe Weather Avoidance Plan (SWAP). This agreement provides for an offshore corridor for use by civil traffic when weather becomes a major factor in routing traffic along the eastern seaboard. SWAP is implemented by the central flow coordinator at Washington Center. FACSFac VaCapes then moves the western edge of the operating areas east in order for air traffic in the National Airspace System to bypass severe weather. This give-and-take is not apparent to the users of the airspace but is essential to the orderly conduct of both military and civil operations.

According to Captain Charles Krotz, commanding officer, there are over 60,000 scheduled events in the FACSFac VaCapes operating areas annually. Although this number of events is substantial, it is not a true reflection of the total activity. An air wing fly-off is considered one event; however, it may include 50 or more airplanes. One event may also include ships and submarines, as well as aircraft.

ACC Douglas Johnson, radar branch manager, had just returned from several days aboard USS *Coral Sea*. "I've been helping to coordinate their fly-off," he said. "Most pilots probably don't think about the work and coordination that has to go into that event. Imagine the confusion if 50 airplanes attempted to enter the National Airspace System with no coordination ahead of time," he continued. Part of his job at FACSFac is to make the fly-off smooth for both the pilots and the FAA.

Right, AC3 Darlene White keeps a watchful eye glued to her monitor while tracking air traffic over the facility's vast airspace. Below, located in an open field just north of NAS Oceana, FACSFac VaCapes is dominated by two large, bulbous towers which overpower the landscape.

Air traffic control is only a portion of the services provided by the FACSFac organization. It coordinates flight services for nearly all types of aircraft through the parent air wings and provides the in-flight services of Flight International, a private aircraft company. P-3 patrol planes, logistics aircraft and telemetry services are not scheduled through FACSFac. It coordinates airborne towed targets, septars and drones and provides range control for missile shoots in the area.

FACSFac VaCapes and her sister organizations are fulfilling a vital role, which enables those who fly to keep their war- fighting skills sharp, while ensuring continued use of the airspace through sound management of a scarce resource. ■

UNITED STATES NAVY

PHOTOGRAPHIC INTERPRETATION

PHOTO RECONNAISSANCE

Swift planes with multiple cameras race over the objective which has been selected for reconnaissance. Photographic missions are made both in daylight and at night.

Aerial photography in the U.S. Navy began about the time that the first naval officers were learning to fly. Establishment of special photographic units took place shortly before the United States became an active participant in WW II.

Today, photography is an integral part of training, research, mapping, reconnaissance and day-to-day naval activities. From its beginning as a novelty in 1915, it has become a vital necessity to the naval service.

These photographs, contributed by Dino A. Brugioni of Hartwood, Va., depict some of the people, places and aircraft involved in photo reconnaissance and photographic interpretation over the years.

Above, from L to R, Capt. C. H. Cox, LCdr. R. S. Quackenbush and Capt. G. L. McCormick, founders of the first Naval Photographic Interpretation Center. Below, the same three men gathered 25 years later during a reunion.

It took early photo interpreters long, painstaking hours to study and extract information from reconnaissance photographs.

Twenty-nine Naval and Marine Corps officers were the first students to graduate from the Navy's first Photo Interpretation School in 1942.

Early photo interpreters on board ships meticulously chart through aerial reconnaissance photographs using small scale landscape replicas within the photo interpretation center.

Students at the University of Chicago learn the basics of aerial photographic reconnaissance interpretation.

Photo Interpretation Centers were also built on the frozen tundra of the Northern Pacific in Adak, Alaska.

Old quonset huts deep within the jungles of Esperito Santo, New Hebrides provided setting for a photo interpretation center.

The Votes Are In

By JO1 Jim Richeson

For more than 70 years, *Naval Aviation News* has been the flagship publication of Naval Aviation, and the results of the most recent readership survey gave *NANews* staff members another thumbs up.

While *NANews'* writers and editors continually strive to disseminate informative and entertaining pieces of information, we seldom hear from our readers concerning their reactions to our endeavors.

The only reliable means of determining our success in reaching our audience and gaining feedback is through readership surveys, which are conducted every two years. The survey cards were distributed in the July-August 1987 issue and returned before October 1.

From the 805 survey cards returned, the overall results were particularly encouraging. The survey shows that more than 90 percent rated *NANews* good to outstanding while only one percent considered it unsatisfactory.

The survey also indicates that *NANews* is reaching an interested and enthusiastic audience regularly on a bimonthly basis. The readers ran the gamut of Navy, Marine Corps, Army, Air Force, government and civilian communities, from flag-rank decision makers to airmen just beginning their first enlistments. The numbers also show that most respondents are mid-to-late career officers and middle management enlisted members.

In terms of likes and dislikes, it is apparent that "Grampaw Pettibone," illustrated by Mr. Robert Osborn since 1943, is still enjoying popularity with our readers. In addition, our audiences lauded feature and historical articles, "People, Planes and Places," and Mr. Harold Andrews' "Naval Aircraft" series. The magazine's interviews, "Flight Bag" and "Professional Reading" departments also received favorable marks.

The survey showed that our readers would like to see more coverage on subjects such as naval aircraft, squadrons, people in Naval Aviation, research, development, test and evaluation, aviation ships and foreign naval aviation.

Feedback from this readership survey will be a valuable tool for the staff members of *NANews* in continuing to improve future issues.

Topgun's newest adversary aircraft, the F-16N Falcon, promises to be a formidable opponent against any aircraft flown by students at the Navy's Fighter Weapons School.

1987 Reader Survey Statistics

Total cards received		**805**
	Rank/Rate	
Navy	**RAdm.**	**1**
	Capt.	**28**
	Cdr.	**60**
	LCdr.	**58**
	Lt.	**68**
	Ltjg.	**7**
	Ens.	**6**
	WO	**5**
	MCPO	**7**
	SCPO	**11**
	CPO	**25**
	PO1	**32**
	PO2	**25**
	PO3	**9**
	E-3	**1**
	E-2	**1**
Retired Navy		**60**
USMC	**MGen.**	**1**
	Col.	**1**
	LCol.	**5**
	Maj.	**19**
	Capt.	**11**
	1st Lt.	**1**
	2nd Lt.	**1**
	WO	**1**
	E-9	**1**
	E-8	**1**
	E-7	**3**
	E-6	**1**
	E-5	**3**
	E-4	**3**
USMCR	**Capt.**	**1**
	2nd Lt.	**1**
	E-2	**1**
	E-1	**1**
Retired USMC		**6**
USAF	**LCol.**	**3**
	Maj.	**2**
	Capt.	**1**
	E-6	**1**
	E'5	**1**
	E-4	**2**
	E-1	**1**
USAFR	**LCol.**	**2**
	Maj.	**1**
	E-6	**1**
Retired Air Force		**3**
USA	**WO**	**1**
	E-6	**1**
USAR	**E-4**	**1**
Retired Army		**3**
USCG	**Capt.**	**1**
	PO-3	**1**
Retired Coast Guard		**3**
USNR	**Capt.**	**7**
	Cdr.	**19**
	LCdr.	**19**
	Lt.	**12**
	MCPO	**5**
	SCPO	**3**
	CPO	**10**
	PO1	**19**
	PO2	**18**
	PO3	**4**
	E-2	**1**
Civilian	**141**	
Civil Service	**48**	
Students	**4**	

ignored his visual directives. A forewarned pilot turned into the groove during a field carrier landing practice approach, easing off power. The LSO-with-the-temper was talking with some pilots and had let his right arm drop alongside, the signal to reduce throttle. The pilot continued on, gritting his teeth, obeying the signal religiously. Finally, his TBD began to wobble. A stall was imminent. He could obey no longer and rammed the throttle forward so hard that he bent the handle.

He had nearly recovered when slipstream from a plane launching on the runway wrapped itself around his machine, skewing it 90 degrees off runway heading. The TBD fell from the sky and plowed through the adjacent forest. The pilot was shaken up but survived. The LSO, contrary to what might have been expected, admitted guilt, took full responsibility, and told the flyer, "If you obey signals that well, you'll have no trouble getting carrier qualified."

Robin M. Lindsey was an assistant LSO aboard *Enterprise* during WW II. He recalled that on December 7, 1941, "Bert Harden (the LSO) turned in as beautiful a job of paddle-waving as I have ever seen when he landed the entire *Enterprise* air group aboard at night without a single blown tire — and with all the torpedo planes carrying fish in their bellies, too. That action represented the first night landings of WW II for our Navy, and it was the first time planes loaded with bombs and torpedoes were ever landed at night."

"The second night of the Midway battle (June 1942)," wrote Lindsey, "gave me my first experience at bringing planes in at night. I will readily admit that my knees were making considerable noise — especially since 10 of the planes had no running lights or approach lights, and all you could go by were the sound of their engines and their exhaust flares. But it was also the first night landing for more than half of the pilots, so they didn't have anything on me."

During the Battle of the Eastern Solomons in August 1942, the flight deck was damaged by Japanese dive-bombers and two arresting wires were lost. Said Lindsey, "By keeping the pilots over on the port side of the landing area, we did very well. Of course, it wasn't too difficult to keep the pilots to port since they could see the large bulge and torn-up deck on the starboard side during their approaches."

LSOs could shoot as well as wave. Lindsey got back at the Japanese one day when a dozen enemy torpedo planes homed in on the starboard bow. "Jimmie Daniels, my assistant, and I jumped into the rear seat of a couple of SBDs and manned the twin .30 calibers," remembered Lindsey. "While all the guns on the ship were firing at the *Kates*, one lone pilot tried to sneak in from dead astern. We let him have it; you could see the tracers ripping into the belly of the plane. It burst into flames and crashed."

Our current crop of LSOs, I'm sure, could measure up to the challenges faced by Robin Lindsey and his contemporaries but I hope they won't have to. During the Battle of Santa Cruz in October 1942, other carriers were disabled and planes flocked to *Enterprise*. Said Lindsey, "I kept bringing in planes until they were parked right up to the number one barrier. Then I brought in some more, until they were parked, back up, to the number nine arresting wire with no barriers. But there were still planes in the air and they were damned low on gas.

"The hangar deck crew called and said they had room for 10 more planes on the hangar deck, so we continued to land planes while the number two elevator was rushing up and down to take planes below. The elevator was on the forward end of the landing area, so it was imperative that the planes catch either the first or second wire or they might end up taking a quick and totally unexpected trip down the elevator — which would be disconcerting to say the least.

"We landed about 10 to 12 more planes, putting them all on the number one wire. The rest still flying had to land in the water, but no carrier ever had so many planes on board before."

So much for the past. There exists today an urgent need for LSOs throughout the fleet and particularly in the training command. As pointed out in the feature article on LSOs in this issue, the men who serve on the platform are a special breed. As a group, none is more respected. The LSO is as much a symbol of carrier aviation as the tailhook.

I urge you young officers in carrier-based aircraft to take a hard look at the Paddles' "profession." As it says in the television ad, "It's a great place to start." ■

Ens. R. J. Grant, USS Enterprise (CV-6) LSO, works an aircraft in the groove, March 1945.

ignored his visual directives. A forewarned pilot turned into the groove during a field carrier landing practice approach, easing off power. The LSO-with-the-temper was talking with some pilots and had let his right arm drop alongside, the signal to reduce throttle. The pilot continued on, gritting his teeth, obeying the signal religiously. Finally, his TBD began to wobble. A stall was imminent. He could obey no longer and rammed the throttle forward so hard that he bent the handle.

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LSOs could shoot as well as wave. Lindsey got back at the Japanese one day when a dozen enemy torpedo planes homed in on the starboard bow. "Jimmie Daniels, my assistant, and I jumped into the rear seat of a couple of SBDs and manned the twin .30 calibers," remembered Lindsey. "While all the guns on the ship were firing at the *Kates*, one lone pilot tried to sneak in from dead astern. We let him have it; you could see the tracers ripping into the belly of the plane. It burst into flames and crashed."

Our current crop of LSOs, I'm sure, could measure up to the challenges faced by Robin Lindsey and his contemporaries but I hope they won't have to. During the Battle of Santa Cruz in October 1942, other carriers were disabled and planes flocked to *Enterprise*. Said Lindsey, "I kept bringing in planes until they were parked right up to the number one barrier. Then I brought in some more, until they were parked, back up, to the number nine arresting wire with no barriers. But there were still planes in the air and they were damned low on gas.

"The hangar deck crew called and said they had room for 10 more planes on the hangar deck, so we continued to land planes while the number two elevator was rushing up and down to take planes below. The elevator was on the forward end of the landing area, so it was imperative that the planes catch either the first or second wire or they might end up taking a quick and totally unexpected trip down the elevator — which would be disconcerting to say the least.

"We landed about 10 to 12 more planes, putting them all on the number one wire. The rest still flying had to land in the water, but no carrier ever had so many planes on board before."

So much for the past. There exists today an urgent need for LSOs throughout the fleet and particularly in the training command. As pointed out in the feature article on LSOs in this issue, the men who serve on the platform are a special breed. As a group, none is more respected. The LSO is as much a symbol of carrier aviation as the tailhook.

I urge you young officers in carrier-based aircraft to take a hard look at the Paddles' "profession." As it says in the television ad, "It's a great place to start." ■

Ens. R. J. Grant, USS Enterprise (CV-6) LSO, works an aircraft in the groove, March 1945.

To Qual

By Ltjg. T. J. Roorda

Airborne, looking down from a TA-4J *Skyhawk* on the way to the carrier, it is a significant moment when you see the green and brown terrain become blue water. Somewhere out there on the deep blue is a floating gray keel, hull and deck meant for a jet airplane with a hook — your jet, your hook.

For a student, it is carrier qualification flight #14 in the advanced jet syllabus. This flight comes very near to the end of a student's training. But that is not reason to assume you have made it. As a Navy jet aviator, all of your training is geared toward this flight. You can be the best pilot in the world in all other phases of training, but if you cannot safely land your jet on a carrier, the Navy has no use for you. There is pressure. It is intense. The adrenalin flows. This is why you wanted to be a Navy jet pilot.

Imagine yourself as a student. You have just finished about a week and a half of field carrier landing practice ("bouncing for the boat") with the expert eye of a landing signal officer (LSO) watching you approach the runway as if you were landing on a carrier. The key words to that last sentence are "as if you were landing on a carrier." There is no way to exactly simulate it anywhere. To truly learn how, you must do it at the boat.

The day to go arrives. The brief begins at 0430. "Brief" is a misnomer for the detailed explanation that precedes the forthcoming carrier experience. The brief is delivered by the lead-safe, an instructor pilot with extensive fleet experience on carriers, who will lead your flight of three students — each alone in his or her own jet — to carrier qualify.

It is 0630. Your flight is rolling down the runway. The rendezvous goes as briefed and you're on your way, flying formation toward the Gulf of Mexico. While most people are rolling out of bed, looking for that first cup of coffee, you are watching the land disappear. The sun, young in the east sky, casts a golden hue on the blue below and, instead of coffee, you're looking for a carrier. The lead-safe finds it. You glance downward and catch a glimpse. Over the radio you hear a voice tell your lead-safe, "Your signal is Charlie," meaning, "It's time."

You follow the lead-safe down to 800 feet above the water. The gray deck, which looked very small from up high, still looks small as you get closer. Your flight of four streaks by the grayness of the boat in echelon formation. Then, each plane peels away in a left turn toward the carrier. Your turn: you break. You concentrate on altitude and on trying to slow down to get the gear down. Suddenly, even though you thought you left the carrier far behind before you turned, it is there to your left. You barely get the landing checklist out when it is time to turn in for your first touch and go on the boat. If someone measured the pulse and blood pressure of a student on this first turn toward the carrier, a new medical term for stress would have to be invented.

Your mind takes in myriad sources of information. Consciously, your eyes are scanning altitude, airspeed and rate of descent from the instruments in your cockpit. Subconsciously, your senses are absorbing the most important input. Your ears hear the pitch of the engine. Your peripheral vision tells you if you are going to roll out on the deck centerline. Above all, though, the seat of your pants tells you how you are doing. If you are sinking too fast, you feel it there. If you're not sinking fast enough, you feel it there, instantly.

You roll toward the ship and line up straight at the deck. Pilots refer to this portion of the carrier approach — from rolling wings level to touchdown — as "the groove." Now, three things take precedence: the ball (the light source for glideslope information), lineup (flying straight toward the deck), and the angle of attack of your aircraft. Of these three, the ball is the most important. All the way down the glideslope, your mind analyzes an abundance of stimuli and makes your hands manipulate the stick and throttle quickly and precisely until the carrier deck abruptly interrupts your glideslope. Slam! Now, you hit full power and take off to come around for one more touch and go. Then, you lower your hook.

Nothing has changed aerodynamically. But your mind knows your hook is down and this time when you slam into the deck and try to take off you will stop — fast. Inside the mind of a student, this is what takes place as he or she rolls into the groove:

"Altitude? Angle of attack? Where's the ball?

"High: Power off . . . got the ball; power on, call the ball.

"Seven-two-five, *Skyhawk*, Ball, Two point four (which means, 'I'm in aircraft 725, a TA-4J *Skyhawk*, I see the ball, and I have 2,400 pounds of fuel remaining in my plane').

"Ball? Low: Power on, nose up . . . lineup? Good.

"Ball? Centered, moving up: Power off, a bit.

"Angle of attack? On speed . . . getting closer.

"Ball? Moving down: Power on a bit.

"Wham! The deck. Full throttle. Slam! Stopped! That little hook worked! I did it!

"No time for a party. Watch the signals. . . ."

After a series of hand signals from the guys who participate in the most intricate human military process ever — the deck crew of a carrier — you are set up for a catapult shot. The "cat shot" is a kick in the butt, literally. At the shot, you feel all of your blood move to the back half of your body. And, as your brain regains its visual capacity, you're flying.

Imagine the force required to accelerate 24,000 pounds of steel, aluminum and jet fuel from a standstill to 160 miles per hour in less than two seconds and 50 meters. It takes very high-pressure steam, shooting a cylindrical-shaped object underneath the forward deck. Your jet is attached to that cylinder; it stops. You don't. You are airborne to turn back, lower your hook, and get five more traps and cat shots.

This whole time, many sets of eyes are watching, most notably your landing signal officer. LSOs are hard to please. After that last trap, you wait for those magic words. In terse Navy jet language, this is what can be heard over the radio:

LSO (called 'Paddles'): "Seven-two-five, Paddles."

You: "Seven-two-five, go ahead."

LSO: "You're a qual."

You: "Roger."

Those words help to complete a year and a half of intense training. You are now considered a carrier aviator. Those Wings of Gold take on even more meaning for you. With the final cat shot, you scream to nobody but yourself, "Awwwwright!" as you shoot off the deck, full of fuel, and head back home to NAS Meridian (Miss.) — alone.

Much discussion has taken place about what makes carrier operations so exhilarating for a pilot. It is the most precise flying there is — an exact balance of potential energy and kinetic energy putting a fast-moving jet on a moving deck. But this precision flying is not a game, or merely a challenge. It has a purpose. That moving deck is a vital instrument to our nation, its security and its ideals. To be a Navy pilot, it is your profession to be a crucial part of that instrument. To be a Navy pilot, it is your job to uphold the principles of duty, honor and country, far out at sea. That is a Navy pilot's reason for being.■

Awards

A VP-50 officer received the highest noncombat honor that can be presented to a member of a foreign military service from the Canadian Forces. Lt. Steve Spiva, the *Blue Dragons'* maintenance material control officer, was presented the Canadian Chief of Defense Staff Commendation while on an exchange tour with the Canadian Forces. During his two-year tour, he rewrote the CP-140 Corrosion Manual, procured state-of-the-art materials for corrosion prevention and control, introduced a corrosion preservation program, and trained key fleet personnel and contractors on corrosion-prone areas and required inspection techniques.

Selected from a group of 105 aviators at VT-6, Marine Capt. Mike Hurley received the honors of both Instructor of the Quarter for the fourth quarter of 1987 and Instructor of the Year for FY 87. He was chosen for providing the greatest contributions to the squadron's training goals and was commended for his tireless efforts, sound judgment and superior instructional ability.

The first woman in the air intelligence officer program to be assigned to an operational aviation squadron at NAS Glenview, Ill., was selected as the Naval Reserve Association's Junior Officer of the Year for 1987. Lt. Rita Marie Szymanski, VP-90's air intelligence officer, was also awarded the Navy Achievement Medal based on her recommendation from the squadron.

Each year the Grumman Aircraft Corporation recognizes outstanding achievement and contributions in the *Tomcat* community. For 1987, "Topcat of the Year" award went to LCdr. Charles Wyatt of VF-74, at the annual Tailhook Convention held in Las Vegas. Wyatt further distinguished himself earlier last year when he received the Fighter Wing One East Coast Fighter Pilot of the Year.

1987 Topcat of the Year, LCdr. Charles Wyatt.

Records

The following units marked safe flying time: VT-6, 250,000 hours and 5-1/2 years; VP-48, 140,000 hours; HS-10, 63,000 hours and 11 years; VS-29, 66,500 hours and 16 years; VT-4, 15,000 hours; VT-10, 21,000 hours; and HSL-43, 25,000 hours.

Lt. Pete Thompson of VS-31 brought his S-3 *Viking* in for a safe landing aboard USS *Dwight D. Eisenhower* (CVN-69), recording the carrier's 100,000th trap.

LCol. Robert J. Garner, HMM-268's C.O., logged his 5,000th carrier flight hour. Most of these mishap-free hours were flown in CH-46s.

While part of *Unitas XXVIII*, two members of VP-56, NAS Jacksonville, Fla., rescued a Chilean youth after he lost control of his automobile. While returning from liberty during a port-of-call visit near Puerto Montt, Chile, Ltjgs. Kenneth L. Gregory and Jeffery T. Bernardi were flagged down by a native youth who explained to their driver that the car he and another passenger were in had veered off the road, over a 20-foot embankment and into the water 20 feet from shore. The two officers immediately began looking for the other survivor. Finally, Bernardi spotted the body lying face down in the water 200 yards away. After wading through chest-deep, 45-degree water to retrieve the youth, the two officers pulled him ashore and began cardiopulmonary resuscitation. Moments later, the victim began breathing. Both Bernardi and Gregory later met with the youth's mother, who expressed her gratitude for their efforts in saving her son's life.

Rescues

For his vigilance on a routine training mission, AT2 David Clark was awarded the Navy Achievement Medal. While aboard a P-3 from VP-31, NAS Cecil Field, Fla., he spotted a life raft which was previously reported missing, 6,000 feet below on the ocean's surface. Petty Officer Clark immediately notified the patrol plane commander, Lt. Robert Rippee, who brought the *Orion* in for a closer look. The two occupants of the 10-man inflatable raft were signaling the aircraft. Assistance was requested from personnel at Coast Guard Air Station, San Francisco, who launched a helicopter that rescued the two men. Petty Officer Clark also received a personal congratulations from Capt. M. E. Thompson, ComPatWing-10, who was aboard the P-3 at the time of the incident.

Honing the Edge

The *Blue Dolphins* of VA-203, winners of the F. Trubee Davison award as the best reserve tailhook squadron, and winners of the latest Noel Davis and CNO Safety awards, again proved to be the best of the best during a recent workup aboard USS *Forrestal* (CV-59). The squadron maintained a 99-percent boarding rate and completed 94 percent of all sorties. Four of the *Blue Dolphin* pilots placed in the top five slots for landing grades even though this was the first time VA-203 participated aboard ship as part of an air wing.

Ocean Safari 87, a NATO maritime exercise, was conducted last fall between the east coast of the United States and Canada and the west coast of Europe in the Norwegian Sea and Norwegian coastal waters. Some 150 ships and 250 aircraft from 11 NATO nations participated, including VA-176, VP-62, and USS *Forrestal* (CV-59).

Et cetera

AB2(AW) Gary Felder, left, and AN Frederick Sims stand with eight of the nine trophies that they won at a Norfolk track meet.

An aircraft being catapulted from the flight deck of an aircraft carrier demonstrates power and speed that are hard to match. Aboard USS *Coral Sea* (CV-43), two sailors are displaying similar characteristics. AB2(AW) Gary J. Felder and AN Frederick A. Sims are track and field athletes who are using the teamwork they learned in the Navy to help each other attain their goals. Felder, a former All-State and All-American track runner, also runs for the All-Navy track team and holds a 10.2-second record in the 100-yard dash. He hopes to compete in the 1988 Olympic Games in Seoul, South Korea. Sims is a former national high school track competitor.

Two crewmen aboard the amphibious assault ship USS *Saipan* (LHA-2) and one assigned to Commander, 2nd Fleet staff embarked aboard USS *Mount Whitney* (LCC-20) were identified as suspected tuberculosis cases during a medical screening. Navy officials recommend that any personnel who have visited either ship since January 1987 take precautionary screening tests. Tuberculosis is spread primarily by coughing. It is treatable, especially when detected early.

MCAS Yuma, Ariz., became a tactical air base last October 1 when Marine Aircraft Group 13 changed places with Marine Combat Crew Readiness Training Group 10. MAG-13, commanded by Col. J. E. Sabow, former commanding officer of Group 10, moved to Yuma where it will eventually operate four AV-8B *Harrier* squadrons. Group 10 relocated to MCAS El Toro, Calif., and has become the parent training organization to all 3d Marine Aircraft Wing training at El Toro, Tustin and Camp Pendleton.

The *Gladiators* of VFA-106, NAS Cecil Field, Fla., became the first fleet training squadron to receive one of eight recently delivered production F/A-18Cs. VFA-106's C.O., Cdr. Les Kappel, received the "keys" for the aircraft from Cecil Field's F/A-18 site manager Gene O'Neil. The new *Hornet* includes a new fuel system, updated avionics and state-of-the-art weapons capabilities.

Right on the heels of VFA-106, with its new aircraft are the *Blackbirds* of VF-45 with the receipt of the F-16N *Falcon* advanced adversary fighter. The *Falcon* is also being delivered to VF-126, the Pacific Fleet adversary squadron, and the Navy Fighter Weapons School, Top Gun. The multirole fighter is a slightly modified version of the U.S. Air Force jet. Its maneuverability, state-of-the-art radar and other advanced features allow the F-16 to better simulate adversary aircraft like the SU-27 and MiGs 29 and 31. The F-16s, like other adversary aircraft, will be painted with Soviet-style markings to further enhance the training realism. The Navy will receive 26 *Falcons* from General Dynamics, the aircrafts' manufacturer.

Anniversaries

Several activities/units celebrated anniversaries: Naval Air Engineering Center, Lakehurst, N.J., 70 years; NAS Glenview, Ill., 50; MCAS Yuma, Ariz., 25; and VA-97, 20 years.

Lt. Ed See

An A-6 Intruder from VA-176 during low level flight in Norway.

A-7Es from VA-82 fly by Mt. Etna in Sicily. Squadron officer and maintenance personnel participated in detachments to Sigonella, Sicily, and Hyeres, France, recently. Both dets involved successful joint exercises with the Italian and French.

Established

The Navy's newest attack squadron, the *Silver Foxes* of VA-155, is based at NAS Whidbey Island, Wash., and will fly the Grumman A-6E TRAM *Intruder*. Skipper Cdr. Jack J. Samar, Jr., is assisted by X.O. Cdr. Keith R. Zimmerman. VA-155 will ultimately be assigned to ComCVW-10 aboard USS *Independence* (CV-62).

Change of Command

CarGru-0466: Capt. Carl Moslener relieved Capt. Thomas Irwin.

CVWR-20: Cdr. Royce Mattson relieved Cdr. William Franson.

HelWingsLant: RAdm. Ronald H. Jesberg relieved RAdm. Leonard G. Perry.

HMH-466: LCol. David T. Swan relieved LCol. William C. E. Wolfe.

HT-18: LCol. Curt Southwick relieved Cdr. Richard D. Childers.

Midway (CV-41): Capt. David L. Carroll relieved Capt. Michael L. Bowman.

NAS Norfolk: Capt. Martin J. Polsenski relieved Capt. John D. Larison.

NavAirPac: VAdm. John H. Fetterman relieved VAdm. James E. Service.

VA-72: Cdr. J. Barry Waddell relieved Cdr. Gordon G. Stewart.

VA-205: Cdr. Michael C. Crabtree relieved Cdr. Dana F. Miller.

VAQ-137: Cdr. Thomas F. Noonan relieved Cdr. Roy C. Christian.

VAW-110: Cdr. D. H. Allen relieved Cdr. H. M. Highfill.

VC-6: Cdr. John M. Cutcher relieved Cdr. Ronald B. Bauman.

VF-101: Cdr. Jay A. Campbell relieved Cdr. Charles M. de Gruy.

VF-124: Cdr. Keith Shean relieved Cdr. Jay Yakeley.

VFA-132: Cdr. John Morris relieved Cdr. Scott Ronnie.

VFA-137: Capt. William Switzer III relieved Cdr. Raymond Thomas.

VMA-214: LCol. Thomas R. Carstens relieved LCol. Novatus N. Kirby.

VMFAT-101: LCol. Paul Conner relieved Maj. Larry Cohen.

VP-40: Cdr. Keith D. Hahn relieved Cdr. Jesse A. Prescott III.

VP-47: Cdr. Christopher S. Larsen relieved Cdr. Rick Cast.

VP-48: Cdr. Robert M. Lunning relieved Cdr. Charles P. Isele.

VP-56: Cdr. James E. Dolle relieved Cdr. Robert G. Simpson.

VP-93: Cdr. Howard Rundell relieved Cdr. Paul Wilhelm.

VR-56: Cdr. Carlton E. Lee relieved Cdr. Thomas S. Stander.

VRC-30: Cdr. Fort A. Zackary, Jr., relieved Cdr. Douglas D. Eller.

VS-0174: Cdr. Thomas C. Young relieved Cdr. John J. Somer.

VS-30: Cdr. Timothy L. Baker relieved Cdr. Philip D. Voss.

VT-4: Cdr. Thomas S. Therrell relieved Cdr. William R. Leddy.

The above insignia were recently approved by the Insignia Board.

PROFESSIONAL READING

By Commander Peter Mersky, USNR-R

Nichols, John B., Cdr., USN(Ret.), and Barrett Tillman. *On Yankee Station: The Naval Air War Over Vietnam.* U.S. Naval Institute, Annapolis, MD 21402. 1987. 179 pp. Illustrated. $16.95.

A major addition to serious literature on the Vietnam war, *On Yankee Station* is a fine collaboration between a high-time F-8 pilot (one of five aviators to achieve over 3,000 hours in the *Crusader*) and MiG killer, and a highly respected aviation historian. This book is not a strict historical chronology of America's longest war, but a treatise of tactics, stimuli and politics which influenced its conduct.

The chapters on air-to-air fighting, strike tactics and search and rescue are simply and knowledgeably written. But there is more. Besides the often-told frustration of the flight crews who fought two wars — one against the communists and the other against the Washington politicians who placed untenable rules of engagement over their heads — there is straight-shooting analysis and suggestions from one who was there.

This book is a must for everyone with an interest in Vietnam, Naval Aviation or modern history.

Fancillon, Rene J. *Japanese Aircraft of the Pacific War.* U.S. Naval Institute, Annapolis, MD 21402. 1987. 570 pp. Illustrated. $21.95.

The 1970 Putnam series has been updated and reprinted by the Naval Institute in conjunction with the California-based Conway Maritime Press. This compendium of Japanese WW II Army and Navy aircraft will provide a major reference in compact, fact-filled form.

There are three-view drawings and at least one or two photos, as well as side drawings, giving representative markings and color schemes. Linked with these drawings is an unusual page of color swatches on the inside rear dust jacket.

The author is well-known for other aviation volumes dealing with American and foreign aviation, and his historical research and coverage rivals that of other doyens, such as William Green and Ray Wagner.

Chinnery, Philip. *Desert Boneyard: Davis Monthan AFB, Arizona.* Airlife Publ., Ltd., England. Motorbooks International, Osceola, WI 54020. 1987. 144 pp. Illustrated. $17.95.

Though the price might appear a little steep for such a small paperback, the color photography and rare peek into the storehouse of aeronautical memorabilia lodged in this southwestern base are worth it. The reader strolls among the cocooned hulks and fuselages of aircraft, catching a black HU-16 *Albatross* of a commando unit, the still-colorful markings of F-4s and F-8s, and the shining metal of resident C-124 and C-133 cargo haulers.

The text tells the story of this unique storage facility and details what it contains in well over 2,500 aircraft, some new and many very old and special. If you've ever wondered what happened to a few of your favorites after they left active service, or enjoy looking at old war-horses, or perhaps are looking for a different color scheme for a model, this book deserves inspection.

Bonds, Ray, ed. *The Modern U.S. War Machine.* Crown Publishers, Inc., New York, NY. 1987. Revised Edition. 240 pp. Illustrated. $14.95.

This paperbound book discusses the defense programs of the U.S. military services. There are capsule histories and operational evaluations of the Army, Navy, Marine Corps and Air Force, as well as sections dealing with the intricate intelligence and security services which often relate to American military activities and programs. Each section is written by an authority in that field, many of whom are retired military officers.

Most of the photos and illustrations are in color and portray much of the hardware and scenarios discussed in the text.

After getting through some obvious proofreading and editing errors, the reader will perhaps feel the book does offer reasonable value for the money and can be used sparingly as a reference.

Hayes, Robert W., Ltjg., USNR(Ret.). *Bless 'Em All: The Adventures of a Navy "Black Cat" Squadron in World War II.* Willow Creek Publishers, 7070 Willow Creek Rd., Eden Prairie, MN 55344. 1986. 88 pp. Illustrated.

A classic example of a wartime memoir, this little book jumps right into the war. There is no biographical data, such as how the author got his wings. Just a story of "off the boat and right into the action."

The book focuses on one "Black Cat" squadron, VPB-34, which appears to be typical of the units operating the PBY in this role. Purely a labor of love, the author takes the reader through a tour of duty with the squadron, from arrival to return home. Along the way, he describes the tedium, the missions and the pangs of separation which affected everyone.

This is a very personally written account and should not be taken as a major piece of wartime research. However, it is a piece of the open-ended puzzle of America's participation in the war and an interesting look at a specific squadron.

U.S. Naval Airpower: Supercarrier in Action. Photography by Neil Leifer. Text by Bill Sweetman. Motorbooks International, Osceola, WI 54020. 1987. 128 pp.

Another entry into the category of outstanding color photography collections illustrating U.S. military airpower, this book does convey the power, beauty and special atmosphere of carrier aviation. All of the stunning photos were taken aboard USS *Carl Vinson* (CVN-70) and, thus, this nuclear carrier and its various squadrons receive maximum exposure.

The well-written text complements the fine photographs of Time-Life photographer Neil Leifer.

This is a good overview of not only the glamorous aircraft but of the carrier itself, its various appendages and moods, and the service philosophy and operating constraints.

FLIGHT BAG

USS Boxer

I wish to locate former shipmates of USS *Boxer*.

AZ2 W. A. Krein II, USNR-R
AFWAL/POOC-3, B-450 D-114
Wright Patterson AFB, OH 45433

VX-3

I was a PH3 in VX-3 stationed at NAS Atlantic City, N.J., from 1952 to 1955. I am trying to find any information about former VX-3 squadron members, reunions, etc.

William L. Wagner
Falls International Airport
c/o Einarson Flying Service
International Falls, MN 56649

PBY Rescue of B-25 Crew

For an article on PBY "Dumbo" *Catalina* operations, I want to contact anyone with information on the rescue of an Air Force B-25 crew on Thanksgiving, November 24, 1943. The Mitchell was one of a group making a low-level attack on the Japanese air base at Kahili, on Bougainville in the Solomons. As the B-25 completed its run, AA scored a direct hit on the port engine, setting it on fire. With the fire out of control and flames sweeping through the fuselage, the pilot kept the plane in the air for several miles, but was finally forced to ditch. The crew escaped the sinking B-25 and crowded into the single raft they had been able to launch. After about four hours, a fighter-escorted PBY found them and, in spite of heavy fire from shore batteries, landed, picked up all hands and took off successfully. B-25 plane commander "Dick" Dickinson, from S.C., remembers the PBY PPC as a Ltjg. named Ed or Ned Cheverton, from Mass. After the rescue, the PBY returned to its base, probably Munda. Dick has attempted many times to locate his rescuer, without success.

Records indicate that VPs 14, 23, 54 and 71 were in the area, under FAW-1, at the time but none of their available records identify this incident. Any details, especially identification of the PBY squadron and crew, will be appreciated.

Capt. W. E. Scarborough, USN(Ret.)
45 N. Port Royal Dr.
Hilton Head Island, SC 29928

Reunions, Conferences, etc.

Professional Aviation Maintenance Association symposium and trade show, March 15-17, George R. Brown Convention Center, Houston, TX. Contact Patti Campbell, PAMA, P.O. Box 248, St. Ann, MO 63074, (314) 739-2580.

VPB-213 reunion, April 6-9, Jacksonville, FL. Contact Norman H. Maffit, 14709 Carlos Circle #70, Rancho Murieta, CA 95683, (916) 354-2219.

PBM Mariner, Mars, Marlin and Seamaster aircrew reunion in conjunction with ANA, April 6-9, Jacksonville, FL. Contact Dave Rinehart, 6590 Alhambra Ave., Suite 100, Martinez, CA 94553, (415) 932-6197.

PBY all-crews reunion in conjunction with ANA, April 6-10, Jacksonville, FL. Contact J. Thompson, 1510 Kabel Dr., New Orleans, LA 70131, (504) 392-1227.

VPML-8/VP-8 reunion, April 15-17, Jacksonville, FL. Contact Beth Perry, VPML-8/VP-8 Alumni Assn., 7926 Praver Dr. W., Jacksonville, FL 32217, (904) 733-5489.

VC-5 reunion, April 29-30, Marriott Hotel on I-285, Atlanta, GA. Contact Shad Shadburn at (404) 889-1575.

VPB-52 Black Cats reunion, April 29-May 1, Williamsburg, VA. Contact Saul Frishberg, 1021 Jeffrey Dr., Southampton, PA 18966, (215) 357-6829.

USS Belleau Wood (CVL-24) and attached air groups reunion, May 5-8, Charleston, SC. Contact Robert L. Ross, 2732 S. U.S. Hwy. 23, Oscoda, MI 48750, (517) 739-2182.

USS FDR (CVA-42) reunion, May 20-22, Corpus Christi, TX. Contact John P. Lyons, 4213 Harry St., Corpus Christi, TX 78412, (512) 992-7876.

Yangtze River Patrol Assoc. reunion, May 23-26, Seattle, WA. Contact Roy W. Ferguson, 145 N.E. Fatima Terr., Port St. Lucie, FL 34983, (305) 878-3422.

VP-72 reunion, May 31-June 3, Imperial Palace Hotel, Las Vegas, NV. Contact N. K. Little, 2435 Pleasant Hill Rd., Pleasant Hill, CA 94523, (415) 935-3139.

USS Lexington CV-2 reunion, April 27-30, San Diego, CA. Contact Walt Kastner, 466 Ivy Glen Dr., Mira Loma, CA 91752.

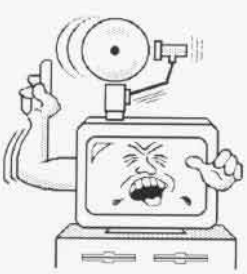
WEATHER FRONT

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

NEXRAD

Doppler radar not only locates storm activity, it also provides quantitative data on the winds within the storm. Severe weather percursors can be automatically identified before they reach the dangerous stage. This will allow the meteorologist time to issue early warnings of tornadoes, flash floods, hailstorms, and thunderstorm downbursts — which are a particular threat to aviation.

The first of a new generation of high-resolution doppler weather radars will be brought on line this year. By the early 1990s, nearly 160 NEXRAD sites will provide coverage for the U.S., Alaska, Puerto Rico and selected DoD overseas locations. NEXRAD is the replacement for the existing weather radar network.



The automated NEXRAD monitors weather conditions continuously and automatically alerts the operator when potentially hazardous conditions are detected. The National Weather Service is the lead agency in this joint project, which also includes the FAA, the Naval Oceanography Command and the Air Force's Air Weather Service.

NAVAL AVIATION NEWS