NAVAL AVIATION NEWS

July—August 1995

1994 Year in Review

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NAVAL AVIATION NEWS

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COVERS—Front: Bimonthly ANA Photo Contest winner, for the second consecutive time, LCdr. Brian G. Gawne clicked these two VF-32 F-14 "pearls" in the earth's oyster (see page 46). Back: LCdr. Gawne's winning photo in the last competition captured VF-32 *Tomcat* "Gypsy 212" on twilight combat air patrol over Bosnia-Herzegovina during Operation Deny Flight (see May–Jun 95, page 29).

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By RAdm. Brent M. Bennitt, Director, Air Warfare

Aircrew Coordination Training

To "improve mission effectiveness of all aviation communities by enhancing crew coordination through increased awareness of associated behavioral skills." This is the purpose of Aircrew Coordination Training (ACT), a term that elicits a variety of responses from aircrew—some good, some not so good. Before I go any further, let me state that ACT has been a part of Naval Aviation since the beginning. We have always had to coordinate the actions of our aircraft with controllers, wingmen and crew members. Unfortunately, we have not always been as successful as we would like, and as a result have ended up with degraded mission effectiveness and catastrophic mishaps. How many of us have followed a lead off into never-never land without questioning the navigation? Many mishap investigation reports list crew coordination as a contributing factor in the mishap.

Put simply, ACT is a means of accelerating the maturation process of aircrew to increase mission effectiveness and improve safety. This is accomplished by identifying the skills and behaviors that constitute good crew coordination and training pilots, NFOs and aircrewmen in how to execute these skills.

JO2 Bobby Jones

RAdm. Brent M. Bennitt

In 1989 the Navy procured a commercial airline ACT course which was provided to every aviation community. This course was well received by some communities and "filed" by others. During the first few years, individual communities made numerous changes ranging from minor modifications to development of entirely new programs—each with the goal of improving mission effectiveness for their specific platform.

In 1990 my office sponsored an ACT program to examine the ACT-related needs of Naval Aviation. This effort determined that there was a need for fundamental change in the training methodology for ACT. Improved aircrew coordination skills have been shown to improve mission effectiveness as well as reduce the possibility of aircrew errors that cause mishaps. For these skills to be enduring and usable they must become "second nature," as familiar as NATOPS procedures. As such, the training methodology has changed to reinforce the ACT principles throughout the entire training pipeline rather than periodically providing a "burst" of ACT.

While not fully complete for all aircraft, the integration of ACT involves curriculum modifications to every flight training syllabus. In this way, ACT will be instructed and reinforced at every phase of training from the first day at the training command to the last day in the fleet squadron. Every flight or simulator event will involve some discussion and instruction of ACT principles. The intention is to effect a behavioral change in the way we operate naval aircraft. These changes are not magical and they are not "touchy feely"; they are changes that will allow all aircrew members to operate more effectively.

ACT should provide all Naval Aviators with the training necessary to better plan, coordinate and accomplish the objectives of a flight. We all recognize that there are certain facets of flying we can improve upon and that we need to train all crew members how to accomplish these tasks. The bottom line is that if you fly in a naval aircraft and talk to somebody, then you need to understand the principles of ACT. Hopefully, you will then better recognize the situation when you start to follow your lead into never-never land.

FLY 'EM SAFE!

An HS-3 SH-60F Seahawk helicopter flies alongside the Roosevelt (CV 71) battle group.

Illustrations by Ted Wilbur

Into the Icy White

An HH-1N *Iroquois* was operating in a cold weather environment characterized by glaciers and the potential for rapidly changing weather. The pilot, copilot and crew chief were on board. They had made several stops along the planned route without difficulty during the daytime flight.

Traveling from Station A to Station B, the *Iroquois* had to circumvent a coastal weather system but proceeded inbound in clear conditions to collect two passengers, foreign nationals, for transport to Station A. One passenger was positioned in the crew chief's jump seat, between the pilots and aft of the radio console, and the other in the troop seat, adjacent to the left cargo door. The crew chief was seated in the troop seat adjacent to the right cargo door.

The HH-1N launched and shortly thereafter the pilot noted that the weather area had spread further out over the sea ice. He elected to skirt the weather to the seaward side. The helo was indicating 45 knots ground speed, headed into the wind. He continued the flight further seaward to bypass the expanding weather, and after some communication difficulties received a report from Station C that it was experiencing two miles visibility with blowing snow. The pilot decided to return to Station B, remaining clear of the leading edge of the weather system.

Near the coast, flying at 250 feet, visibility decreased. The crew chief told the pilot he had lost visual contact on the right side and the copilot concurred.

The pilot announced he was going to reverse course. He climbed to 350 feet and began a left 10-degree angle of bank turn using a rocky outcrop to the left for reference. After 135 degrees of turn, the aircraft encountered instrument meterological conditions. Shortly, the pilot experienced a descending sensation and noted zero airspeed plus mushy controls. The crew chief warned that the aircraft was losing altitude. The pilot increased collective, but before the helo responded the HH-1N crashed into the top of a glacier.

The main transmission and rotor head separated from the aircraft as the helo slid on the glacier top, shedding components and tearing apart. The crew chief and both passengers were killed and the pilot and copilot injured. The pilot had no gloves on and his hands were unprotected for over three hours until rescue forces arrived. The copilot had a fractured femur and dislocated hip. They huddled together using sleeping bags from the wreckage until help came. Both suffered frostbite and hypothermia.

Grampaw Pettibone says:

Hell on ice! These folks ran into one of mother nature's mean streaks, and situational awareness went by the boards. Granted, this area can be very unfriendly to aviators. But it appears the pilot could have turned right toward an area of safer, flat terrain, rather than toward the rocky outcropping. It also turns out that the pilot was aware that another station in the vicinity was within range and had visual meterological conditions. At the time of the turn, the HH-1N was experiencing a 60-knot head wind. The reversal led to a predictable 60-knot tail wind. Yet, the pilot became momentarily confused with the large decrease in indicated airspeed, which preceded the sudden settling of the aircraft.

Also, it's beyond Gramps how you can go without gloves in a climate like that!

In Naval Aviation, expect the unexpected—especially mean streaks from you know who.

Trouble on Takeoff

A two-place F/A-18D *Hornet* crew, consisting of the pilot and weapons system offcer (WSO), briefed for a close air support mission as number two in a six-plane flight. The mission commander briefed nose wheel liftoff (NWLO) speed as 146 knots with aircraft rotation at 156 knots, based on the weapons/fuel load and configuration of the F/A-18s. The number two crew briefed NWLO speed at 138 and main wheel liftoff (MWLO) speed at 153. The properly computed NWLO speed for the *Hornet's* configuration was 168 knots with MWLO at 178 knots.

On the runway the takeoff sequence began normally. The lead *Hornet* launched successfully, commencing nose wheel rotation at 164 knots. The pilot of the number two *Hornet* went to military power, selected afterburner, scanned the instruments and started his takeoff roll. At 60 knots the heads-up display (HUD) blinked for a second. At 120 knots an unrecognizable tone was heard, without visible warnings. The pilot called, "120 going flying."

At 148 knots the pilot brought the control stick aft (.875 inches, as later determined from a computer readout) but felt no response. Stabilator deflection was normal. At 160 knots, sensing there was a problem, the pilot retarded throttles and released back pressure on the stick, intending to abort takeoff.

Decelerating through 155 knots the pilot neutralized the stick and called, "Aborting." He dropped the tailhook, extended the speed brake and applied foot brakes. At 112 knots the hook skipped over the cross-deck pendants of the overrun gear, which had not been tensioned. At 84 knots the pilot and WSO ejected successfully, suffering minor injuries. The aircraft came to rest off the runway, sustaining major damage, and was secured by the crash crew.

Grampaw Pettibone says:

In the old days we just cranked her up, aimed into the wind and chugged across the pasture until the rickety bird leapt into the wild blue. But it's a business of immense detail now, and calculating takeoff weight, center of gravity (CG) and speeds TO THE NTH DEGREE are an absolute must.

Investigators determined that the command failed to disseminate correct aircraft weight and CG data to aircrews. Thus, calculations were off from the start. They noted a trend of unfamiliarity with respect to accurate weight and CG figures among the pilots and WSOs. This led to an atmosphere conducive to briefing incorrect NWLO and MWLO speeds. The mission commander, in this case, thus briefed inaccurate NWLO and MWLO data, as did the mishap crew.

The *Hornet* pilot thought he would get airborne sooner than physically—or should we say, aerodynamically—possible. The errant tone and abbreviated HUD flicker contributed to his uncertainty along with the lack of reaction to back stick. The momentary HUD blinking is a common problem in Lot XIV F/A-18s, by the way, which was the case here. Don't know about the errant tone.

Max abort speed for the *Hornet* is 130 knots, except in a dire emergency. To certify that this wasn't the *Hornet* crew's day, the long field arresting gear crew had failed to tension the cross-deck pendant on the elevating supports. Had that been done, the *Hornet* and its occupants could have been brought to a safe halt.

Details, ladies and gents, details. Bad show. Nuff said.

Aviator Flag News

RAdm. Brent M. Bennitt was nominated for promotion to Vice Admiral and command of Naval Air Force, U.S. Pacific Fleet, probably this autumn. The following flag officers also received orders to new billets: **RAdm. Charles S. Abbot** to Director, J-3, European Command, Stuttgart, Germany. **RAdm. Herbert A. Browne, Jr.**, to Deputy and Chief of Staff, Commander in Chief, U.S. Pacific Fleet. **RAdm. Daniel T. Oliver** to Deputy Chief of Naval Personnel, Bureau of Naval Personnel. **RAdm. Ernest E. Christensen, Jr.**, to Commander, Training Command, U.S. Atlantic Fleet, Norfolk, Va. **RAdm. Jon S. Coleman** to Director of Training, Chief of Naval Education and Training, Pensacola, Fla. **RAdm. Michael L. Bowman** to Commander, Naval Doctrine Command, Norfolk, Va. **RAdm. Robert S. Cole** to Naval Base, Norfolk, Va. **RAdm. John R. Ryan** to Commander, Fleet Air Mediterranean/Commander, Maritime Air Forces, Mediterranean, Naples, Italy. **RAdm. (sel) Jay B. Yakeley III** to Carrier Group Three. **RAdm. (sel) Larry D. Newsome** to Naval Air Warfare Center Aircraft Division, Patuxent River, Md.

Marine Flag Moves

Lt. Gen. George R. Christmas was nominated by the president to become Commanding General of all Marine forces in the Pacific, replacing **Lt. Gen. Charles C. Krulak** who was confirmed by the U.S. Senate to become the next Commandant of the Corps. **Lt. Gen. Charles E. Wilhelm** was nominated to become Commanding General of all Marine forces in the Atlantic, replacing **Lt. Gen. Robert B. Johnston** who is expected to retire. **Maj. Gen. Paul K. Van Riper** was nominated for promotion to Lieutenant General and to take over from Lt. Gen. Wilhelm as Commanding General, Marine Corps Combat Development at Quantico, Va.

18 Test Pilots Selected

One lieutenant commander and 17 lieutenants were selected to attend the U.S. Naval Test Pilot School (USNTPS) at NAS Patuxent River, Md. Five of the lieutenants will attend Naval Postgraduate School in Monterey, Calif., starting in July 1995 followed by USNTPS in January 1997: Lts. Robert Floyd, Kevin Gish, John Klein, Thomas Popp and Kevin Quinn. The remaining students will begin test pilot school in the 1997 class: LCdr. Daniel Lee and Lts. Scott Fisher, Charles Gordon, Peter Ulrich, Neil Woodward, John Martins, Dean Wilson, Gregory Burgess, William Koyama, James Webb, John Groth, Steven Labows and James Robbins.

National Museum of Naval Aviation Honors Enlisted

The Chief of Naval Operations unveiled a special exhibit 5 May at the National Museum of Naval Aviation, Pensacola, Fla., honoring enlisted Naval Aviation Pilots and all enlisted men and women who played a role in Naval Aviation history. Between 1916 and 1981, more than 5,000 enlisted sailors, marines and coast guardsmen, E-5 through chief petty officer, wore their Wings of Gold and saw action in every engagement and battle from WW I through Vietnam. The exhibit, located on the museum's second deck, features mockups of a WW II-era aircraft carrier and a WW II Marine airbase on a remote Pacific island.

First F/A-18E/F Nears Assembly Completion

McDonnell Douglas began final assembly of the F/A-18E/F on 8 May. The program is on schedule and on budget toward rollout of the completed aircraft on 19 September and the first flight in December. The last phase of assembly will join the forward fuselage built by McDonnell Douglas and the center/aft fuselage made by Northrop Grumman. Also, the wings, built by McDonnell Douglas, will be attached to the fuselage, mechanical and electrical wiring will be completed, avionics and landing gear installed and operational systems tested. The engine contractor, General Electric, delivered the first F414 engines in May. Seven of the test engines have operated for more than 4,300 ground test hours of the 6,000 test hours planned before the first flight.

Corporate News

McDonnell Douglas remained the top supplier to the U.S. military for FY 1994 with a total of $9.2 billion in prime contract awards. The next top four positions were held by Lockheed, Northrop Grumman, Martin Marietta, and General Motors. These five companies had 23 percent of the total prime contracts awarded. Additionally, the No. 1 company gave its helicopter division, McDonnell Douglas Helicopter Systems, approval to produce the MD 600N, a new tailrotor-less helicopter initially called the MD 630N when introduced in January. The 600N is a seven-to-eight place, single-turbine engine, six-bladed main rotor aircraft built with the NOTAR antitorque system. First year production is already sold out and the new aircraft will be delivered to its first customer in mid-summer 1996.

Raytheon completed its acquisition of E-Systems, Inc. By combining the two companies, Raytheon now has $12 billion in annual sales and plans to fully integrate virtually all of E-Systems into its fold with little operational overlap. The company also announced the signing of a $1.4 billion Brazilian contract with a U.S. consortium led by Raytheon. The consortium will build a satellite sensing and imaging network. The Amazon Surveillance System will use telecommunications and satellite, ground-based and airborne systems to help Brazil monitor its borders and airspace.

Additionally, **Raytheon Aircraft** was awarded an $11.8 million contract to provide 88 AQM-37C aerial targets to the Navy. Deliveries of the target missiles are scheduled to begin in August 1996 and continue until August 1997 with production options worth $10 million per year possible for three additional years. The AQM-37C supersonic missile is an air-launched vehicle used by the Navy and NATO nations and includes a digital autopilot, a telemetry system for flight evaluation and a command/control system allowing lateral maneuvers for course correction as well as dives and pull-ups to simulate missile threats.

The Australian government chose **Rockwell International**

to purchase its company, Aerospace Technologies of Australia, Ltd. (Asta), which makes aircraft components such as rudders, flaps and doors, and provides engineering services for defense and other industries. Asta was advertised for sale in 1993 at a price of around $45 million.

Kaman Aerospace was awarded a $2.5 million contract from Lockheed Martin Tactical Aircraft Systems to qualify and manufacture structural components for weapons-bay doors on the F-22 Advanced Tactical Fighter. The company will fabricate three families of composite resin transfer molded structural parts, commonly called "hat stiffeners," that will be used to provide structural integrity for the weapons-bay doors of the stealth aircraft. Deliveries are scheduled for 1995 through 1998 with $27 million in sales possible through full production of the F-22.

R. L. Ridgell Electric, Leonardtown, Md., won a $1.1 million Navy contract for airport taxiway light replacement.

Sanders, Lockheed Martin Company's Defense Systems Division, received a $5.2 million contract for four Air Traffic Control Radar Beacon System, Identification Friend or Foe, MKXII System (AIMS) antenna group systems and associated spares. The contract exercises the first option of a three-year contract to provide up to seven antennas per year. Designated the OE-120/UPX, the AIMS antenna group is deployed on CG 47-class cruisers, DDG 51-class destroyers, LHA 1-class helicopter assault ships as well as Japanese navy destroyers. Sanders also won combined $11.7 million contracts for aircraft defensive electronic countermeasures systems for Italy and Malaysia. Under the U.S. Navy Foreign Military Sales program, Sanders will produce four AN/ALQ-126B systems for Malaysian F/A-18s and four AN/ALQ-164 systems for Italian AV-8Bs.

Lockheed Martin Tactical Aircraft Systems received two contracts worth over $12 million for advanced manufacturing technology development for the Joint Advanced Strike Technology program. One contract worth $5.9 million is for integration of design systems with advanced modeling tools to more accurately gauge costs, and the other contract worth $6.4 million is to integrate simulation and modeling tools to create a virtual manufacturing environment.

Additionally, **Lockheed Martin Astronautics** won a $92.2 million contract from NASA's Jet Propulsion Laboratory to build the Mars Surveyor 1998 orbiter and lander vehicles. The two spacecraft will study the climate and search for water in the martian soil.

Loral Aerospace Services, Chesapeake, Va., won a $224,500 Navy contract to operate aviation physiology/water survival training devices.

Boeing launched its Heliwing autonomous unmanned aerial vehicle on a four-minute first flight in April at Moses Lake, Wash. Flying like a helicopter, the aircraft climbed to 42 feet then descended and hovered in a stationary position about 10 feet above its launching area before landing. The 8-foot-long, 17-foot-wide aircraft is designed primarily for military surveillance under a $2.6 million Department of Defense contract and is powered by a single 140-hp Williams International turboshaft engine. After a helicopter takeoff, the aircraft increases vertical speed and pitches forward using wing flaps to fly airplane-like before returning to helicopter flight for landing. It is designed to carry up to a 200-pound payload and reach speeds up to 180 knots.

BF Goodrich Aerospace acquired **Technology Integration, Inc.**, Bedford, Mass., a research and development company that designs aircraft equipment diagnostic systems.

Refresher Training Leaving Gitmo

Fleet Training Group (FTG) and Engineering Training Group (ETG), Guantanamo Bay, will move to Naval Base, Mayport, Fla., beginning 1 July. FTG Mayport will be established 15 July and will include 10 officers and 81 enlisted members. The engineering group will be totally disbanded and its 1 officer and 10 enlisted personnel will be incorporated into the existing ETG Mayport. For many years, Atlantic Fleet ships have sailed to Gitmo for a few weeks prior to deployments in order for crews to sharpen their skills in navigation, emergency procedures, engineering and damage control. FTG and ETG Guantanamo coordinated and assisted in this training. Training will now be conducted off the Florida coast.

Boeing's Heliwing hovers during a test flight in Moses Lake, Wash.

New LAMPS Block I Rolled Out

The first Block 1 upgrade of the SH-60B accomplished by the Navy/Sikorsky/Loral Regional Facility rolled out at NAS North Island, Calif. This upgraded version of the LAMPS (Light Airborne Multi-Purpose System) SH-60B evolved from contractor inputs, lessons learned from operational units and the need for an aircraft platform versatile enough to meet multimission objectives in a complex and often unpredictable threat environment. Some of the changes and additions from previous models include an M-60 machine gun mount, AAR-47 missile detecting system, ALE-39 chaff/flare dispenser, ALQ-144 infrared jammer, global positioning, new radios and receivers, and multiple engine system improvements.

Reserve Battle "E" Winners

Commander, Naval Air Reserve Force announced the 1994 Noel Davis Award Battle "E" winners: HCS-4, VFA-204, VFC-13, VP-65, HS-75 and VR-46.

NASA Navy News

Navy astronaut Capt. Ken Cockrell will pilot the shuttle *Endeavour* on an 11-day research mission, STS-69, this summer under the command of Navy astronaut Capt. David Walker. The mission objectives include two deployments and retrievals of the Wake Shield Facility spacecraft and the SPARTAN-201 solar research spacecraft, as well as the payload bay-mounted International Extreme Ultraviolet Hitchhiker experiment.

Navy astronaut Capt. Robert Gibson will command the shuttle *Atlantis* on the first U.S. shuttle-*Mir* Russian space station docking mission, STS-71. The mission will be the first joint docking mission between two countries since the Apollo-Soyuz test project flight in 1975. The European Space Agency-designed SPACELAB pressurized laboratory module will be carried in the shuttle's payload bay to serve as both a scientific laboratory and logistics carrier for resupply of *Mir*. The crew of *Mir* will also be swapped during this mission.

Navy astronaut Cdr. Ken Bowersox was named to command the second mission of the U.S. Microgravity Laboratory on board the shuttle *Columbia* this autumn on STS-73. Cdr. Kent Rominger will serve as pilot and LCdr. Michael Lopez-Algeria will be *Columbia's* ascent/entry flight engineer and orbit pilot.

Navy astronaut Capt. Bill Readdy was selected to command the shuttle *Atlantis* on the fourth shuttle-*Mir* docking mission, STS-79, in July 1996. The mission objective is to demonstrate the capability to transfer experiments from *Atlantis's* payload bay to *Mir's* docking module, and the first shuttle-*Mir* flight of the SPACEHAB habitable module in the orbiter's payload bay. The crew will conduct American and Russian crew exchanges and assist in the resupply and payload activities for the Russian space station.

UK's RAF to Give up Nuclear Role

The United Kingdom announced 4 April that WE177 free-fall nuclear bombs will be withdrawn by the end of 1998 and the Royal Air Force will give up the nuclear role. The WE177 has been in service since 1966. The UK's Armed Forces Minister said that "the Trident submarine system will provide a continuously available substrategic service" after a new Trident submarine joins the patrol cycle at the end of this year. Also, the UK announced 6 April that Britain would not conduct any more nuclear test explosions.

Sixth Fleet Change

VAdm. Donald L. Pilling became Commander of the U.S. Sixth Fleet and NATO's Naval Striking and Support Forces, Southern Europe, 19 April. Pilling relieved Adm. Joseph W. Prueher who became the new Vice Chief of Naval Operations.

Aircraft Mishaps

RAdm. James G. Prout III, Commander, Carrier Group Three, and Cdr. Joseph Kleefisch, CO, VFA-25, were both killed when their **F/A-18** *Hornet* crashed 17 May in northwest New Mexico.

Capt. David E. Bowser, USMC, VMFA-251, was killed 24 March when his Marine **F/A-18** crashed near Cold Springs, Nev. The aircraft was conducting carrier air wing training from NAS Fallon, Nev., in preparation for deployment aboard *America* (CV 66).

An **F-14A** *Tomcat* of VF-213, deployed aboard *Lincoln* (CVN 72), crashed 27 April in the Pacific Ocean. Both crew members, LCdr. Stacey Bates and Lt. Matthew Crawford III, were rescued uninjured.

An HMH-262 **CH-46E** *Sea Knight* crashed 11 May into the Gulf of Thailand while attempting to land on *Belleau Wood* (LHA 3). All three crewmen were rescued by the ship's search and rescue helicopter and were reported in good condition.

Two VF-21 aviators ejected from their **F-14A** aboard *Independence* (CV 62) 18 April when the nose wheel slipped off the port side of the flight deck as they were taxiing into position for launch. Both crew members, Lts. Kevin Colling and Richard Byrnes, were rescued uninjured by two SH-60Fs assigned to HS-14. The aircraft was recovered from the edge with minor damage.

Capt. John Jantzen, USMC, VMFA-134, was rescued with minor injuries 24 April after his **F/A-18** overshot the runway and crash landed at NAS Miramar, Calif. A small brush fire was extinguished by base firefighters.

King Hussein Hooked on TR

The King of Jordan, Hussein Ibn Talai, landed aboard *Theodore Roosevelt* (CVN 71) in a VS-24 S-3B *Viking* and toured the ship while it was conducting operations in the northern Red Sea. An experienced pilot, the King said that he enjoyed the landing very much. King Hussein addressed the crew and invited them to visit Jordan.

JAST Update

Lockheed Martin's Skunk Works delivered its 86 percent-scale vertical takeoff model for the Joint Advanced Strike Technology (JAST) program to the NASA Ames Research Center on 1 May and began hover testing in June. The test model, which is part of the advanced short takeoff/vertical landing (ASTOVL) program, is powered by a Pratt & Whitney F100-PW-220+ engine that provides conventional thrust as well as shaft power to drive a lift fan. JAST includes an ASTOVL aircraft configuration for the Marines, a conventional configuration without the lift fan for the Air Force, and a conventional U.S. Navy tailhook aircraft.

White Picked as Deputy SECDEF

President Clinton chose John White, Chairman of the Commission on Roles and Missions of the Armed Forces, to be the next Deputy Secretary of Defense (SECDEF). If the Senate approves, White will jump to the recently vacated position which John Deutch left to become CIA director. White has previously served as Assistant SECDEF for Manpower, Reserve Affairs and Logistics from 1977 to 1978 and is a major in the Marine Corps Reserve.

International News

Finland's first F-18 *Hornet* successfully completed its initial flight 21 April at Lambert International Airport, St. Louis, Mo. After being painted with Finnish air force markings, the aircraft officially rolled out 7 June. The first seven aircraft will be F-18Ds and will be delivered initially to the U.S. Navy; four will later be delivered to Finland in Novem-

ber. The remaining 57 aircraft will be F-18Cs, which will undergo final assembly and ramp operations at Valmet Aviation, Inc., Halli, Finland. The Finnish F-18 is equipped with the latest technologies available, including twin General Electric F404-GE-402 enhanced performance engines and the Hughes APG-73 radar.

The **United Arab Emirates** chose Eurocopter's AS-565SA *Panther* over rival entries from Sikorsky and Westland for a $235 million contract for seven naval helicopters. The contract also included a retrofit to naval configuration of five AS-532 *Cougars* operated by Abu Dhabi's air force. The *Panthers* will have Aerospatiale's AS-15TT lightweight antiship missile, Thomson-CSF's Agave chin-mounted radar and Thomson-CSF self-protection electronic warfare suite. The *Cougars* will be outfitted for antisubmarine and antiship missions equipped with dipping sonar, surface search radar, Aerospatiale AM-39 Exocet antiship missiles and antisubmarine torpedoes.

The **United Kingdom**'s basic helicopter training for all military services will be consolidated in 1997 at the Defence Helicopter Flying School to be located at the Royal Air Force base at Shawbury, Staffordshire. The change, due to the government's cost-cutting review, requires the transfer of current Royal Navy training at Culdrose, Cornwall, and Army Air Corps training at Middle Wallop, Hampshire, to Shawbury.

Indonesia will take delivery of 16 British-made *Hawk* fighter jets this year and base them at Pekanbaru on Sumatra Island. The $760 million contract calls for deliveries in several batches throughout the rest of 1995. Pekanbaru was chosen because it is located near Singapore, Malaysia and the Straits of Malacca.

India will purchase 30 new MiG-29s worth $1.25 billion from Russia later this year. The deal also includes upgrading older MiG-29s, already in use by the Indian air force, with new avionics and more modern air-launched missiles. The government also plans to obtain 48 two-seat Sukhoi Su-30MKs from Russia and has already acquired 10 MiG-21U two-seat trainers from the Bulgarian and Hungarian air forces.

Japan's Maritime Self-Defence Force (JMSDF) retired its last remaining Kawasaki P-2J *Neptune* after flying the aircraft for 620,000 accident-free hours. The *Neptune* first entered JMSDF service in 1959 when Lockheed delivered the first of 16 P2V-7s. Another 48 were built by Kawasaki, which then developed and built 82 turboprop P-2Js between 1969 and 1979.

Switzerland's national aerobatic team, the Patrouille Suisse, switched from the F.58A *Hunter* to the F-5E *Tiger II* and will use the new aircraft in the coming summer season. *Hunters* were retired from the Swiss air force.

Garry Jones, **Australia**'s Defense Minister, stated that 30 percent of the country's $7.2 billion defense budget will be allocated to procurement for the next several years. Plans are to buy up to 30 maritime surveillance, offshore combatant and utility helicopters for major surface ships. Additionally, Australia is planning to replace its aging UH-1H fleet with up to 50 new helicopters configured for a scout-reconnaissance role.

France will purchase five U.S. Air Force-surplus KC-135Rs in order to boost its aerial tanking capability before making a long-term purchase of more modern aircraft.

The **Republic of the Philippines** is beginning an estimated $12 billion, 15-year military modernization program. The initiative, begun in part to compensate for the U.S. withdrawal, will include the purchase of fighters, helicopters, various warships, air defense radars and other hardware. One of the requirements for the program is that the armed forces cannot consider procuring any system that is not in service with at least three other countries.

BRAC Adds to Closure List

The Base Realignment and Closure Commission (BRAC) added 35 bases, including NAS Atlanta, Ga., and NAS Point Mugu, Calif., to the recommended list for realignment or closure on 10 May. The president will receive the final full list on 1 July.

Disestablished...

VP-93 Executioners

A 17 September 1994 ceremony at NAF Detroit, Mich., marked the disestablishment (officially 30 September) of Patrol Squadron (VP) 93 after over 18 years of service. Cdr. Chris John Cluster was the last skipper of the *Executioners*.

Established at NAF Detroit 1 July 1976, VP-93 was the last of 13 reserve patrol squadrons to be formed as part of the reorganization of the Naval Air Reserve during the 1970s. Equipped with the P-3A *Orion*, VP-93 became the seventh squadron assigned to Commander Reserve Patrol Wing, Atlantic.

The *Executioners* made their first overseas operational detachment to Bermuda in 1978. The squadron began transitioning to the P-3B in January 1980, followed by an upgrade to the TACNAVMOD (tactical navigation modification) version of the P-3B in May 1986.

During its existence, VP-93's operations ranged from ICEX missions in the Arctic to Unitas exercises in South America. The *Executioners* augmented active duty VP squadrons in operations and exercises throughout the Atlantic, Caribbean and Mediterranean, including tracking Soviet submarines and interdicting drug runners. During its last year of operations, VP-93 flew armed missions in support of the UN embargoes of the former Yugoslav republics and Haiti. VP-93 flew the Navy's last operational mission of the P-3B on 14 March 1994, and ended its own flight operations on 24 March 1994 after over 40,000 mishap-free flight hours.

Rick Burgess contributed the disestablishment article.

1994 Year in Review

By Judith A. Walters, Rick Burgess and Steven D. Hill

In 1994 age-old hatreds resurfaced or threatened to do so throughout the world. The U.S. Navy could, therefore, expect to be called upon to respond to local threats in a rapidly evolving world security situation. Now that the cold war was over, so was the danger of facing a strategic nuclear war on the high seas. The new situation called for the right re-sizing of the Navy's personnel and materiel. What was needed was a Navy with a strong forward position at sea from which it could respond to crises in the littoral areas of the world.

In order to achieve a right-sized Navy, many aviation squadrons and naval shore facilities were disestablished, reorganized or consolidated. A total of 37 squadrons and 1 air wing were disestablished throughout the year—the largest number for a single year in 44 years. Immediately prior to the outbreak of the Korean War, between June 1949 and June 1950, a total of 46 squadrons were disestablished; the next largest number took place between June 1962 and June 1963 when 29 squadrons were disestablished. This past year's disestablishments are indicative of the scope of the reduction in force and reorganization that Naval Aviation is currently undergoing.

The Defense Authorization and Appropriations Bill provided FY 1995 funds for the construction of a new aircraft carrier (CVN 76). The bill also provided money for more F/A-18Cs and -Ds, the upgrade and modification of the F-14, as well as support for research and development of the F/A-18E/F and V-22 and money for the overhaul of ships and aircraft.

In March Navy Amphibious Ready Groups (ARGs) on board *Peleliu* (LHA 5) and *Inchon* (LPH 12) guarded the coast of Somalia as the last U.S. troops were withdrawn from that country. ARGs were also rotated off the coast of Haiti in support of UN-mandated sanctions. In September *Eisenhower* (CVN 69) and *America* (CV 66) deployed to the Caribbean in support of President Clinton's policy to restore a democratic government to Haiti.

In October, after Iraqi troops had massed on the Kuwaiti border, President Clinton dispatched *George Washington* (CVN 73) to the Red Sea to protect Kuwait from possible invasion. Iraq withdrew from the Kuwaiti border and recognized the sovereignty of Kuwait, but UN sanctions on Iraq remained in place.

On her last deployment, *Saratoga* (CV 60), with Carrier Air Wing (CVW) 17 embarked, provided support for Operations Deny Flight and Provide Promise off the coast of Bosnia-Herzegovina. *Saratoga* then returned to Mayport, Fla., where she was decommissioned in August. This brought the total number of active carriers down to 12.

In October *Eisenhower* became the first aircraft carrier to deploy with women permanently assigned on board. Plans were also made for women to deploy aboard *Abraham Lincoln* (CVN 72) and the yet-to-be-commissioned *John C. Stennis* (CVN 74).

The year brought further cooperation between the United States and its former enemy, Russia. The two countries made plans for a rendezvous in space. In preparation, space shuttle *Atlantis* was retrofited so that it could dock with the Russian space station *Mir*. Also, in Patuxent River, Md., Russian pilots tested nine F/A-18 *Hornets*, while U.S. Navy pilots sat in the back seat.

January

01 The Navy began training aviators at NAS Kingsville, Texas, using the new T-45 Training System, which included the T-45 *Goshawk* jet trainer. The *Goshawk* will replace the aging T-2 *Buckeye* and TA-4 *Skyhawk*.

18 In a press briefing held at the Pentagon, Chief of Naval Operations Adm. Frank B. Kelso II emphasized that while the naval forces of the future would have smaller numbers of ships, aircraft and Navy/Marine Corps personnel, the capability of these smaller forces would be significant due to the wise use of technologies and prudent cost-cutting measures.

31 RAdm. Lyle G. Bien relieved RAdm. Leonard N. Oden as Commander, Naval Space Command.

F/A-18C Hornets from VFA-151. Over the last 10 years the Vigilantes have provided excellent annual command history reports, which are required by OPNAV instruction 5750.12 and are due 1 March. Questions concerning command history reports may be directed to the Naval Aviation History Office at (DSN) 288-4355, or commercial (202) 433-4355.

February

01 *Saratoga* (CV 60), with CVW-17 embarked, took station in the Adriatic Sea. The carrier's Joint Task Group would participate in a variety of U.S., NATO and UN missions throughout the Mediterranean, Black and Red seas. *Saratoga* and CVW-17 were to provide combat air patrol and command control and surveillance aircraft for Operations Deny Flight and Provide Promise off the coast of Bosnia-Herzegovina.

03–11 Space shuttle *Discovery* went into space with Naval Aviator Col. Charles F. Bolden, Jr., USMC, as commander and Naval Aviator Capt. Kenneth Reightler as pilot.

04 The first C-20G was delivered to NAS Patuxent River, Md., for a month of testing. The aircraft was to be assigned to VR-48, NAF Washington, D.C.

08 President Clinton released the FY 1995 defense budget. It included funding for the construction of the then-unnamed CVN 76 and procurement of 24 F/A-18 *Hornets*.

18 Ens. Alta DeRoo became the first female Naval Aviator to be winged into the E-2 *Hawkeye* community in a ceremony held in Norfolk, Va.

21 Lt. Shannon Workman became the first female combat pilot to successfully pass fleet carrier qualifications. She was embarked on board *Dwight D. Eisenhower* (CVN 69) and assigned to VAQ-130 based at NAS Whidbey Island, Wash. Lt. Workman was slated to be one of four female aviators to deploy with *Eisenhower* in October.

March

03 The *Peleliu* (LHA 5) Amphibious Ready Group (ARG) joined the *Inchon* (LPH 12) ARG off the coast of Somalia to support the withdrawal of U.S. troops redeploying from Somalia.

03 The last A-6E *Intruder* to receive a composite wing at Naval Aviation Depot, Norfolk, Va., marked the end of the A-6 Composite Rewing Program. The Navy had begun the program in 1990 to replace the metal wings normally used on the aircraft as they reached the end of their fatigue life. The A-6 is scheduled to be phased out by 1999.

04–18 Space shuttle *Columbia* went into space with Naval Aviators Cdr. Pierre J. Thuot and Lt. Col. Andrew M. Allen, USMC, aboard.

07 The Naval Air Reserve received the second of four new C-20G *Gulfstream IV* cargo jets during a rollout ceremony at the Gulfstream Aerospace Facility in Savannah, Ga.

07 Sixty-three women received orders to *Dwight D. Eisenhower* (CVN 69), the first combat ship to have women permanently assigned.

13 Chairman of the Joint Chiefs of Staff Gen. John M. Shalikashvili visited sailors and Marines aboard *Peleliu* (LHA 5) off the coast of Somalia to express his gratitude for their service during Operation Restore Hope.

17 The X-31 Enhanced Fighter Maneuverability aircraft flew at Mach 1.2 using thrust vectoring vanes instead of its tail surfaces for control. This flight was a significant "first" in aviation history.

19 A T-45A *Goshawk*, the first U.S. Navy training jet equipped with a digital cockpit (Cockpit-21), was flown by an experimental test pilot in an inaugural flight from McDonnell Douglas facilities in St. Louis, Mo.

23 The last U.S. troops left Somalia, where they had been supporting Operation Restore Hope.

24 The last American military transport ship to depart Somalia, Training Ship *Empire State*, left Mogadishu while the *Peleliu* (LHA 5) Amphibious Ready Group remained off the coast in support of UN operations in Somalia.

30 The model designation AGM-154A was assigned to the Joint Standoff Weapon.

31 The popular name *Peregrine* was assigned to the BQM-145A medium-range unmanned aerial vehicle.

April

01 The first operational flight of the Airborne Multisensor Pod System took place at Naval Air Warfare Center Weapons Division, Point Mugu, Calif.

28 A *Saratoga*-based F/A-18 *Hornet* crashed in the Adriatic Sea during take-off from the carrier, killing the pilot. The death was the first among the NATO allies conducting air operations in support of Bosnia.

29 The U.S. Navy Penguin missile MK-2 Mod 7 reached initial operational capability and was launched for the first time by a fleet unit on 25 June when an SH-60B from *Hewitt* (DD 966) fired an operational missile. The Penguin is a short-range, inertially guided antiship missile system. HSL-51 Det 6 accomplished the firing at the Pacific Missile Range Facility off the coast of Hawaii as part of RIMPAC 94 exercises.

Dwight D. Eisenhower (CVN 69) prepares to depart Norfolk, Va., for the Haitian coast without CVW-3 embarked. Instead she carries 1,800 soldiers and 51 helicopters from the U.S Army's 10th Mountain Division.

VF-143 F-14B Tomcats approach the Navy's newest carrier George Washington (CVN 73) during workups in the spring of 1994.

Carrier and Air Wing Deployments 1994

Saratoga (CV 60)
CVW-17 (Tail Code: AA)
Mediterranean
11 January–24 June 1994

Squadrons	Aircraft
VF-103	F-14B
VFA-81	F/A-18C
VFA-83	F/A-18C
VA-35	A-6E
VAQ-132	EA-6B
VAW-125	E-2C
VS-30	S-3B
HS-15	SH-60F
VQ-6 Det A	ES-3A

Carl Vinson (CVN 70)
CVW-14 (Tail Code: NK)
WestPac/Indian Ocean
18 February–15 August 1994

Squadrons	Aircraft
VF-11	F-14D
VF-31	F-14D
VFA-25	F/A-18C
VFA-113	F/A-18C
VA-196	A-6E
VAQ-139	EA-6B
VAW-113	E-2C
VS-35	S-3B
HS-8	SH-60F/HH-60H
VQ-5 Det B	ES-3A

George Washington (CVN 73)
CVW-7 (Tail Code: AG)
Mediterranean
20 May–17 November 1994

Squadrons	Aircraft
VF-142	F-14B
VF-143	F-14B
VFA-131	FA-18C
VFA-136	FA-18C
VA-34	A-6E
VAQ-140	EA-6B
VAW-121	E-2C
VS-31	S-3
HS-5	SH-3H
VQ-6 Det B	ES-3A

Kitty Hawk (CV 63)
CVW-15 (Tail Code: NL)
WestPac/Indian Ocean
24 June–22 December 1994

Squadrons	Aircraft
VF-51	F-14A
VF-111	F-14A
VFA-27	F/A-18A
VFA-97	F/A-18A
VA-52	A-6E
VAQ-134	EA-6B
VAW-114	E-2C
VS-37	S-3B
HS-4	SH-60F/HH-60H
VQ-5 Det C	ES-3A

Constellation (CV 64)
CVW-2 (Tail Code: NE)
WestPac/Indian Ocean
10 November 1994–10 May 1995

Squadrons	Aircraft
VF-2	F-14D
VMFA-323	F/A-18C
VFA-151	F/A-18C
VFA-137	F/A-18C
VAW-116	E-2C
VAQ-131	EA-6B
VS-38	S-3B
HS-2	SH-60F/HH-60H

Dwight D. Eisenhower (CVN 69)
Haiti
Operation Uphold Democracy
13 September–23 September 1994

Squadrons	Aircraft
HS-7	SH-3H
HCS-4	HH-60H
HC-2	CH-53E

10th Army Mountain Division, 1,800 troops and 51 helicopters

America (CV 66)
Haiti
Operation Uphold Democracy
12 September–22 October 1994
No Navy squadrons embarked
160th Army Special Operations Aviation Regiment (Airborne), 64 helicopters

Dwight D. Eisenhower (CVN 69)
CVW-3 (Tail Code: AC)
Mediterranean
20 October 1994–14 April 1995

Squadrons	Aircraft
VF-32	F-14A
VFA-37	F/A-18C
VFA-105	F/A-18C
VA-75	A-6E
VAQ-130	EA-6B
VAW-126	E-2C
VS-22	S-3B
HS-7	SH-3H
VQ-6 Det C	ES-3A

Carriers and Home Port Assignments 1994

Saratoga	CV 60	Decomm 20 August
Independence	CV 62	Yokosuka, Japan
Kitty Hawk	CV 63	North Island, CA
Constellation	CV 64	North Island, CA
Enterprise	CVN 65	Norfolk, VA
America	CV 66	Norfolk, VA
John F. Kennedy	CV 67	Mayport, FL
Nimitz	CVN 68	Bremerton, WA
Dwight D. Eisenhower	CVN 69	Norfolk, VA
Carl Vinson	CVN 70	Alameda, CA
Theodore Roosevelt	CVN 71	Norfolk, VA
Abraham Lincoln	CVN 72	Alameda, CA
George Washington	CVN 73	Norfolk, VA
John C. Stennis	CVN 74	Newport News, VA
Harry S. Truman	CVN 75	Authorized
Ronald Reagan	CVN 76	Authorized

HS-7 embarked aboard Dwight D. Eisenhower (CVN 69) for operations off Haiti and for the carrier's regular six-month deployment to the Mediterranean.

May

02 Two F-14B *Tomcats* from VF-103 aboard *Saratoga* (CV 60) delivered three GBU-16 (Paveway II) laser-guided bombs to direct hits at Capo Frasca Target Complex, Sardinia, Italy. This was the first time the F-14 had accomplished this feat.

05 The National Museum of Naval Aviation, Pensacola, Fla., inducted five new members into its Hall of Honor: Brig. Gen. Joseph J. Foss, USMC; Capt. Ashton Graybiel, USN; Col. Gregory "Pappy" Boyington, USMC (deceased); Adm. Frederick H. Michaelis, USN (deceased); and VAdm. Apollo Soucek, USN (deceased). The new inductees were selected for their contributions to technical or tactical development, or for their achievements in combat or noncombat flight operations in and for Naval Aviation.

05 The House Armed Services Committee approved $3.65 billion for the then-unnamed aircraft carrier CVN 76 and advance procurement for the large-deck amphibious ship LHD 7 as part of its $263.3 billion defense budget for 1995. CVN 76 will become the Navy's twelfth aircraft carrier supported by the Department of Defense's Bottom-Up Review.

16–17 Russian pilots tested nine F/A-18 Navy fighter jets at Patuxent River, Md., while U.S. Navy pilots sat in the back seat.

24 Secretary of the Navy John Dalton announced that VT-24 would move from NAS Kingsville, Texas, to NAS Meridian, Miss. The move was made as part of the Navy's plans to transition from the aging T-2 *Buckeye* and TA-4 *Skyhawk* to the T-45 *Goshawk*.

24–25 VFAs 146 and 147 were the first two operational F/A-18C fleet squadrons to receive *Hornets* with the new APG-73 radar.

25 The last four A-4 *Skyhawk* light-attack planes on the West Coast, attached to the Navy Fighter Weapons School (Top Gun) at NAS Miramar, Calif., left without ceremony to take their place in storage at Davis-Monthan AFB near Tucson, Ariz.

June

05–06 *George Washington* (CVN 73) hosted the nation's top leaders, including President Clinton and First Lady Hillary Rodham Clinton, on the occasion of the 50th anniversary of D day. *George Washington* was first off the coast of Portsmouth, England, and then at sea off Omaha Beach and Pointe du Hoc, where Americans landed on D day.

28 The first Georgia-built P-3C *Orion* rolled out of the assembly hangar at Lockheed Aeronautical Systems Co. in Marietta marking the "official" return to production of the maritime patrol aircraft.

July

01 A ceremony marked the closing of NAS Moffett Field, Calif. The air station was originally commissioned NAS Sunnyvale in 1933. It was the home port of the Navy's dirigible *Macon*. After *Macon* went down in a storm off Point Sur, the Navy transferred NAS Sunnyvale to the U.S. Army. The station reverted to the Navy in 1942 and was redesignated NAS Moffett Field, in honor of RAdm. W. A. Moffett, who was killed in the crash of the dirigible *Akron* in 1933.

01 The schedule for the Joint Primary Aircraft Training System (JPATS) flight evaluation at Wright-Patterson AFB, Ohio, was established. Aircraft from various manufacturers would be evaluated from 24 July through 8 October. JPATS would replace the T-34C and T-37B with a common training system, including aircraft, academics and simulators.

05 The model designation NF-14B was established. The F-14B aircraft (BuNo 163223) had been so extensively modified to support research and development testing that it was beyond practical and economical limits to restore the aircraft to normal fleet configuration.

06 The model designation NAV-8B was established. The AV-8B aircraft (BuNo 163871) had been so extensively modified to support research and development testing that it would be beyond practical and economical limits to restore the aircraft to normal fleet configuration.

06 The *Inchon* (LPH 12) Amphibious Ready Group (ARG) departed Norfolk, Va., en route to the Caribbean waters off the coast of Haiti. The four-ship ARG would augment combined forces already in that region assigned to enforce UN Security Council sanctions aimed at restoring democracy to Haiti.

07 The popular name *White Hawk* was established for the VH-60N, whose primary mission was to provide worldwide executive transport in support of the President and his staff.

08 Space shuttle *Columbia* left from Cape Canaveral, Fla., with Naval Aviator

6 June 1944. The Allied invasion of France begins. Naval Aviators from VCS-7 are on hand providing air spotting support for naval gunfire while flying RAF Spitfires marked with black-and-white recognition bands, known as invasion stripes.

Col. Robert D. Cabana, USMC, as commander.

08 The model designation NTAV-8B was established. The TAV-8B aircraft (BuNo 162747) had been so extensively modified to support research and development testing that it would have been beyond practical and economical limits to restore the aircraft to normal fleet configuration.

13 The Naval Air Systems Command, Arlington, Va., was presented the Presidential Award for Quality in a ceremony at the Seventh Annual National Conference on Federal Quality in Washington, D.C.

24 *Saratoga* (CV 60) returned to Mayport, Fla., after her final deployment.

25 Construction was started on *Bonhomme Richard*, the sixth *Wasp*-class LHD authorized by Congress. *Bon Homme Richard*, the name of John Paul Jones' ship, had been the name of CV 31, an *Essex*-class aircraft carrier.

31 Lt. Kara Hultgreen made her first qualifying landing in an F-14A on board *Constellation* (CV 64), 110 miles southwest of San Diego, Calif. She thus became the first fully qualified female *Tomcat* pilot. Lt. Hultgreen was assigned to VF-213 at NAS Miramar, Calif. Ltjg. Carey Dunai, also in an F-14, became the second woman to reach the milestone with her qualifying trap moments later.

6 June 1994. Fifty years later, invasion-striped A-6E Intruders from VA-34 commemorated the invasion by overflying the now-silent American invasion beaches code named Utah and Omaha.

August

04 The X-31 experimental aircraft established a new record at the Dryden Research Center, Edwards, Calif., by completing its 438th flight.

09–20 Space shuttle *Discovery* went into space with Naval Aviator Capt. Richard N. Richards as commander.

17 The *Inchon* (LPH 12) Amphibious Ready Group (ARG) returned to its home port of Norfolk, Va. It was relieved by the *Wasp* (LHD 1) ARG off the coast of Haiti in support of Operation Support Democracy.

20 *Saratoga* (CV 60) was decommissioned in a ceremony at NS Mayport, Fla. She was the Navy's oldest active duty aircraft carrier, having been launched 8 October 1955 and commissioned 14 April 1956.

31 Five Navy MH-53 minesweeper helicopters arrived at MCAS Tustin, Calif., as the H-53 training of both Navy and Marine personnel began to consolidate. With the disestablishment of HM-12, the Navy's H-53 fleet readiness squadron, the Marines assumed the training responsibility in HMT-302.

September

12–13 A unique operation developed due to the situation in Haiti. *Eisenhower* (CVN 69) and *America* (CV 66) deployed with a large contingent of Army helicopters on board, but no air wings. The carriers headed for the Carribean in support of President Clinton's policy to restore democracy to Haiti. *Eisenhower* also embarked Navy squadrons HS-7, HCS-4 and HC-2. This was the first time that carriers deployed operationally with a large contingent of Army helicopters and no air wing on board.

27 After completing the most extensive overhaul in U.S. Navy history at Newport News Shipbuilding, Va., the world's first nuclear-powered aircraft carrier, *Enterprise* (CVN 65), returned to her home port at Norfolk, Va.

30 The aircraft model designation TC-18F was established for two Boeing 707-382B aircraft. The aircraft had been extensively modified to include cockpit avionics and a universal air refueling receptacle for dry contacts only. The Naval Training Support Unit at Tinker AFB, Okla., was using these aircraft to train pilots for the VQ-3 and -4 TACAMO (take charge and move out) mission aboard E-6A aircraft.

30 President Clinton signed the Defense Authorization and Appropriations Bill for FY 1995, which contained funding for the construction of a new aircraft carrier (CVN 76). The bill also provided funds to buy 24 F/A-18C/Ds and the upgrade and modification of F-14s, as well as support for research and development of the F/A-18E/F, continued development of the V-22 and money for major overhauls of ships and aircraft.

30 Sep–11 Oct Space shuttle *Endeavour* went into space with Naval Aviator Capt. Michael A. Baker as commander.

October

01 NAS Fort Worth, Texas, was established as a joint reserve force base. The air station would be home for the Navy and Marine Corps squadrons formerly based at NAS Dallas, Texas, which was closing, and NAS Memphis, Tenn., which would no longer be an air station.

01 Due to its new mission, HS-85 was redesignated HC-85 and shifted to Commander Helicopter Wing, Reserve. Since April 1993, HS-85 had been carrying out the target/torpedo launch and recovery mission at San Clemente Island off the California coast.

01 Commander Patrol Wings, U.S. Atlantic Fleet, was established in Norfolk, Va., with RAdm. Michael D. Haskins as its first commander.

05 The first aviator class to use the T-45 Training System (T45TS) received their wings and graduated from VT-21 in a ceremony at NAS Kingsville, Texas. The T-45 *Goshawk*, a modified version of the British Aerospace *Hawk*, is the aircraft element of the integrated T45TS, which includes simulators and academic training.

06 President Clinton paid a visit to the sailors and marines aboard *Dwight D. Eisenhower* (CVN 69) to thank them for their service off Haiti.

07 President Clinton dispatched *George Washington* (CVN 73), with CVW-7 embarked, and its battle group to the Red Sea to protect Kuwait from the Iraqi troops massing on its border. *George Washington* arrived in the Red Sea 10 October. Additionally, the *Tripoli* (LPH 10) Amphibious Ready Group, with 2,000 embarked marines, moved to the northern Persian Gulf.

07–08 Naval Air Warfare Center Aircraft Division (NAWCAD), Warminster, Pa., celebrated 50 years as a center of Naval Aviation. It began in 1944 as the Naval Air Modification Unit to make prototype modifications on Navy aircraft. In 1949 it was designated the Naval Air Development Center, and in 1992 it became the Warminster site of the NAWCAD.

15 During a port visit to Yokosuka, Japan, Secretary of the Navy John Dalton presented the Navy and Marine Corps Medal for heroism to five sailors aboard *Kitty Hawk* (CV 63). The sailors had exhibited heroism during a flight deck emergency on 11 July when an F-14 *Tomcat* struck the ramp of the carrier's flight deck and burst into flames. The five flight deck personnel quickly entered the flames into which the ejected pilot descended, rescuing him and extinguishing the fire.

20 *Dwight D. Eisenhower* (CVN 69) completed a Mediterranean deployment. She initially had the most advanced technology available in the fleet and became the first aircraft carrier to have women permanently assigned.

25 Lt. Kara S. Hultgreen, the first woman to fully qualify as an F-14 *Tomcat* pilot, was killed in a training accident while attempting to land on board *Abraham Lincoln* (CVN 72). She was with VF-213.

28 Ground was broken for a hangar that would become the new home of VP-30 at NAS Jacksonville, Fla. The fleet readiness squadron trains Navy pilots, naval flight officers, airborne systems specialists and ground maintenance personnel in the operation of the P-3 *Orion* patrol aircraft. VP-30 became the sole Navy P-3 fleet readiness squadron in October 1993 upon the disestablishment of VP-31 on the West Coast.

Aviation Command Changes in 1994

Note: The dates listed here are official and may differ from those reported in earlier issues, and from ceremonial dates.

Established	
Commander, Patrol Wings, U.S. Atlantic Fleet	04 Oct
Naval Air Station, Fort Worth—Joint Reserve Base	01 Oct
VX-9	30 Apr
Disestablished	
NAF Detroit, MI	01 Apr
NAS Moffett Field, CA	01 Jul
Commander, Reserve Carrier Air Wing 30	31 Dec
HC-1 Fleet Angels	29 Apr
HC-16 Bullfrogs	01 Apr
HM-12 Sea Dragons	30 Sep
HM-19 Golden Bears	05 Nov
HS-12 Wyverns	30 Nov
HSL-32 Tridents	31 Jan
HSL-33 Sea Snakes	29 Apr
HSL-74 Demon Elves	01 Apr
VA-36 Roadrunners	31 Mar
VA-42 Thunderbolts	30 Sep
VA-85 Black Falcons	30 Sep
VA-205 Green Falcons	31 Dec
VA-304 Firebirds	31 Dec
VAQ-137 Rooks	30 Sep
VAQ-309 Axemen	31 Dec
VAW-88 Cottonpickers	31 Dec
VAW-110 Firebirds	30 Sep
VF-43 Challengers	01 Jul
VF-74 Bedevilers	30 Apr
VF-124 Gunfighters	30 Sep
VF-126 Bandits	01 Apr
VF-202 Superheats	31 Dec
VF-301 Devil's Disciples	31 Dec
VF-302 Stallions	31 Dec
VFA-303 Goldenhawks	31 Dec
VFA-305 Lobos	31 Dec
VP-22 Blue Geese	31 Mar
VP-49 Woodpeckers	01 Mar
VP-60 Cobras	01 Sep
VP-67 Golden Hawks	30 Sep
VP-90 Lions	30 Sep
VP-93 Executioners	30 Sep
VR-51 Flamin' Hookers	30 Sep
VRC-50 Foo Dogs	07 Oct
VS-27 Seawolves	30 Sep
VX-4 Evaluators	30 Sep
VX-5 Vampires	29 Apr
Decommissioned	
Guadalcanal (LPH 7)	31 Aug
Saratoga (CV 60)	20 Aug
Activated	
HMH-366	30 Sep
Deactivated	
HML-771	01 Aug
HML-776	01 Jul
MATCS-48	15 Nov
MWSS-174	30 Sep
VMO-4	30 Jul
Redesignated	
HMA-773 to HMLA-773	01 Jul
HMA-775 to HMLA-775	01 Aug
HML-767 to HMLA-775 Det A	01 Aug
HS-85 to HC-85	01 Oct
MAG-24 to 1st MAW Aviation Support Element, Kaneohe Bay	30 Sep
MALS-24 to MALSE-24	30 Sep
MCAS Kaneohe Bay to MCB Hawaii	15 Apr
SOMS Kaneohe Bay to MCAF Kaneohe Bay	30 Jul
VMA-124 to VMFA-124	15 Nov

During 1994, 37 squadrons and 1 air wing were disestablished. This was the largest number of squadron disestablishments for a single year in 44 years.

November

15 *John F. Kennedy* (CV 67) completed the drydock phase of overhaul at the Philadelphia Naval Shipyard. She will be the last aircraft carrier to be overhauled at the site before the yard is closed.

15 Cdr. Donnie Cochran assumed command of the *Blue Angels*, becoming the first African American skipper of the Navy's flight demonstration squadron. Cdr. Cochran had commanded VF-111, NAS Miramar, Calif., and had flown with the *Blues* from 1985 to 1988.

December

06 The "Spirit of Naval Aviation," a monument dedicated to the thousands of Navy, Marine Corps and Coast Guard aviation personnel who have earned Wings of Gold, was unveiled at the Smithsonian's Air and Space Museum, Washington, D.C. The monument will be displayed at the National Museum of Naval Aviation, Pensacola, Fla.

08 NASA announced the selection of 5 Naval Aviators to be among its 19 new astronaut candidates for the space shuttle pilot instruction program: LCdr. Scott Altman, VF-31; Cdr. Jeffery Ashby, VFA-94; LCdr. Joe Edwards, Jr., Joint Staff; Cdr. Dominic Gorie, VFA-106; and Lt. Susan Still, VF-101, the first female Naval Aviator to be chosen for this program. Naval reservist LCdr. Kathryn Hire was also selected for training as a mission specialist.

09 Secretary of Defense William Perry announced several changes in Department of Defense modernization programs that would allow $8 billion to be shifted to higher priority programs affecting military pay, readiness and quality of life. The Department of Defense looked carefully at nine modernization programs as part of the budget and program review.

20 Robert C. Osborn died at his home in Salisbury, Conn., at the age of 90. He had drawn the cartoon "Grampaw Pettibone" in *Naval Aviation News* for over 51 years. During WW II he was the creator of the "Dilbert the Pilot" and "Spoiler the Mechanic" posters, which were seen throughout the Navy, and the "Sense" pamphlets.

A flight of four F/A-18C Hornets from VFA-151, one of CVW-2's three assigned VFA squadrons. CVW-2 embarked aboard Constellation (CV 64) in November for the carrier's first deployment since completing her recent overhaul.

Coral Sea (CV 43), the Ageless Warrior, is broken up for scrap by the Seawitch Marine Salvage Company at Baltimore, Md.'s, Fairfield Terminal.

A-6E Intruders from VA-35 are shown secured inside their hangar at NAS Oceana, Va. In August CVW-17 was forced to place its aircraft in short-term storage due to a lack of operating funds.

VR-56 operates four Douglas C-9B Skytrain II transports, providing logistics support for Navy and Marine Corps regular and reserve forces.

Bureau Numbers Issued in 1994

Numbers below were assigned by the CNO during 1994 for future Navy and Marine Corps aircraft procurement:

Numbers	Qty	Type	Popular Name	Contractor
165317-165341	25	AH-1W	Super Cobra	Be
165342-165343	2	E-6A	Mercury	Bo
165344-165347	4	CH-53E	Super Stallion	S
165348-165351	4	C-130T	Hercules	L
165352-165353	2	KC-130T	Hercules	L

Contractor codes:
Be = Bell Bo = Boeing L = Lockheed S = Sikorsky

Active Patrol Squadron Major Deployments 1994

NAS Keflavik, Iceland		
Sep 93–Mar 94	VP-45	P-3C UIIIR
Feb 94–Aug 94	VP-5	P-3C UIIIR
Aug 94–Feb 95	VP-24	P-3C UIIIR
NAS Sigonella, Sicily (Det at Jeddah, Saudi Arabia)		
Sep 93–Feb 94	VP-26	P-3C UII.5
Feb 94–Jul 94	VP-23	P-3C UII.5
Jul 94–Jan 95	VP-10	P-3C UII.5
NS Roosevelt Roads, P.R. (Dets at Howard AFB, Panama, and Soto Cano AB, Honduras)		
Jul 93–Jan 94	VP-16	P-3C UIIIR
Jan 94–Jul 94	VP-11	P-3C UII.5
Jul 94–Dec 94	VP-8	P-3C UII.5
Dec 94–Jun 95	VP-45	P-3C UIIIR
NAF Misawa, Japan (Det at NAF Kadena, Okinawa)		
Nov 93–May 94	VP-4	P-3C UIIIR
May 94–Nov 94	VP-40	P-3C UIII
Nov 94–May 95	VP-1	P-3C UIIIR
NAF Diego Garcia, B.I.O.T. (Det at Al Masirah, Oman)		
Nov 93–May 94	VP-9	P-3C UIIIR
May 94–Nov 94	VP-17*	P-3C UIIIR
Nov 94–May 95	VP-47	P-3C UIII

* Detachment also at Jeddah, Saudi Arabia

Key to P-3C Aircraft:
UII.5 = Update II.5
UIII = Update III
UIIIR = Update III retrofit

VP-26 was deployed to Jeddah, Saudi Arabia, during January and February 1994, and supported Operation Deny Flight, the no-fly zone over war-torn Bosnia-Herzegovina, as well.

Carrier and LAMPS MK III Ship Deployments, 1994

HSLWINGPAC

Carl Vinson (CVN 70) Battle Group
18 Feb 94–15 Aug 94

Squadron	Ship
HSL-37 Det 4	*Reuben James*
HSL-45 Det 2	*Antietam*

Kitty Hawk (CV 63) Battle Group
24 Jun 94–22 Dec 94

Squadron	Ship
HSL-37 Det 3	*Crommelin*
HSL-43 Det 2	*Cowpens*
HSL-49 Det 2	*Vincennes*

Constellation (CV 64) Battle Group
10 Nov 94–15 May 95

Squadron	Ship
HSL-37 Det 6	*Chosin*
HSL-37 Det 9	*Lake Erie*
HSL-47 Det 1	*Kinkaid*

Individual Deployments

Dates	Squadron	Ship	Exercise
18 Oct 93–18 Apr 94	HSL-43 Det 8	*John Young*	MEF 4-93
18 Oct 93–18 Apr 94	HSL-47 Det 6	*Gary*	MEF 4-93
19 Jan 94–19 Jul 94	HSL-45 Det 6	*Oldendorf*	MEF 1-94
27 Jan 94–26 Jul 94	HSL-37 Det 7	*Fletcher*	MEF 1-94
20 Apr 94–20 Oct 94	HSL-49 Det 9	*Shiloh*	MEF-2-94
23 Apr 94–20 Oct 94	HSL-47 Det 10	*Paul F. Foster*	MEF 2-94
27 Apr 94–01 Oct 94	HSL-51 Det 2	*Thatch*	MEF 3-94
12 Aug 94–02 Jan 95	HSL-51 Det 4	*Rodney M. Davis*	MEF 3-94
12 Aug 94–02 Jan 95	HSL-51 Det 6	*Hewitt*	MEF 3-94
25 Oct 94–25 Apr 95	HSL-43 Det 5	*Jarrett*	MEF 4-94
25 Oct 94–25 Apr 95	HSL-45 Det 7	*David R. Ray*	MEF 4-94
25 Oct 94–25 Apr 95	HSL-47 Det 2	*Vandergrift*	MEF 4-94
02 Dec 94–18 May 95	HSL-43 Det 1	*Valley Forge*	CD OPS

A West coast SH-60B conducting ASW.

HSLWINGLANT

Saratoga (CV 60) Battle Group
11 Jan 94–24 Jun 94

Squadron	Ship
HSL-42 Det 9	*Taylor*
HSL-44 Det 4	*Carr*
HSL-44 Det 10	*Vicksburg*
HSL-46 Det 6	*Arthur W. Radford*
HSL-46 Det 7	*Philippine Sea*
HSL-48 Det 7	*Comte D. Grasse*

George Washington (CVN 73) Battle Group
20 May 94–17 Nov 94

Squadron	Ship
HSL-42 Det 8	*Deyo*
HSL-44 Det 9	*Thomas S. Gates*
HSL-46 Det 10	*Doyle*
HSL-48 Det 8	*San Jacinto*
HSL-48 Det 10	*Conolly*

Eisenhower (CVN 69) Battle Group
20 Oct 94–14 Apr 95

Squadron	Ship
HSL-42 Det 2	*Klakring*
HSL-46 Det 1	*Peterson*
HSL-46 Det 3	*Robert G. Bradley*
HSL-46 Det 5	*Anzio*
HSL-48 Det 1	*Cape St. George*

Individual Deployments

03 Dec 93–03 Jun 94	HSL-42 Det 10	*Hancock*	MEF 1-94
15 Jul 94–15 Jan 95	HSL-42 Det 3	*Leyte Gulf*	MEF 1-95
29 Aug 94–28 Feb 95	HSL-42 Det 6	*Yorktown*	SNFL 3-94
31 Mar 94–31 Aug 94	HSL-44 Det 5	*Briscoe*	MEF 2-94
25 Mar 94–25 Aug 94	HSL-44 Det 7	*Stephen W. Groves*	MEF 2-94
06 Jul 94–01 Dec 94	HSL-44 Det 1	*Stump*	UNITAS 35
21 Oct 94–21 Apr 95	HSL-44 Det 8	*Halyburton*	MEF 1-95
15 Jul 94–15 Jan 95	HSL-46 Det 4	*John L. Hall*	MEF 2-94
03 Dec 93–03 Jun 94	HSL-48 Det 4	*Underwood*	MEF 1-94
06 Jul 94–01 Dec 94	HSL-48 Det 4	*McInerney*	UNITAS 35
21 Oct 94–21 Apr 95	HSL-48 Det 3	*Gettysburg*	MEF 1-95

Two HSL-46 SH-60Bs fly past Capri.

Aircrew Coordinati

ACT The Missing Link

By LCdr. Edward J. Buckley

"We're still at 2,000, right?" This was one of the last recorded statements from Eastern Airlines Flight 401, December 1972. Ninety-nine people were killed when a perfectly flyable L-1011 crashed into the Florida Everglades. What was missing?

For the past two decades, commercial aviation, the federal government and, more recently, the military have expended substantial resources in reexamining the various causes of aircraft mishaps. Analysis of data that has become available from cockpit voice recorders, flight data recorders and mishap investigation reports highlights the human errors that are the number one cause of aviation accidents.

The Navy has long recognized human error as a key factor in the majority of its mishaps and has taken positive steps to include this recently developed improved understanding. A major result is the development of the Aircrew Coordination Training (ACT) program. Today, the Navy is recognized as the military's lead service in promoting and integrating aircrew coordination training through the ACT Instructional Model Manager located in the Naval Aviation Schools Command (NASC), Pensacola, Fla. The ACT Instructional Model Manager provides standardization and guidance to fleet units in management, instruction and development of type/model/series-specific ACT programs. It promotes mission effectiveness by continuously improving flight crews' coordination skills.

The goals of the Navy's ACT program are to increase mission effectiveness, minimize preventable crew errors, maximize crew coordination, and optimize risk management. To attain these goals, the Fleet Readiness Squadron (FRS) is designated as the focal point for the entire program. Here, platform- and mission-specific ACT materials are developed for fleet application. Working with civilian contractors (many with fleet experience), the FRS ACT model managers create type-specific integrated programs that teach ACT principles throughout their syllabi. This integrated approach includes the use of simulators, lectures, videos, flights and computer-based training devices.

Fleet pilots, Naval Flight Officers and aircrew personnel attending the ACT Instructor Course at NASC Pensacola receive state-of-the-art training in management, development and instruction of new ACT programs. This five-day course includes:

- The history and administration of the ACT program.
- Lectures on the management and development of integrated ACT pro-

on Training . . .

grams, including information on contractors, quality control and material development.

- Instruction in word processing and graphics presentations. Workshops are conducted in a computer classroom designed to enhance students' ability to create professional materials for use at the FRS and fleet level.
- Extensive training in the development and use of case studies and scenarios for their specific ACT programs. The students also present their new materials in class and receive previously developed case studies and scenarios on computer disk to take home and add to their ACT libraries.
- Lectures on how to become better classroom instructors, including a review of the principles and techniques taught at the Academic Instructor Training Course aboard NASC.

Students leave the course with the ACT Instructional Model Manager's complete program on computer disk, including text and graphics; an in-class-developed case study and scenario ready for FRS or fleet instruction; a complete student guide; and certification, including a course completion certificate and Naval Air Training and Operating Procedures Standardization (NATOPS) jacket entry sheet.

It is imperative that the ACT Instructional Model Manager stay in touch with the fleet. Beginning this summer, informal site visits will be conducted to observe current programs and obtain examples of developed materials to improve the course and better serve the students.

As with safety, ACT is an all-hands effort. ACT principles go well beyond the cockpit, reaching into the very fiber of the way the Navy does business. This program is developed by aviators, for aviators—as was NATOPS. To remain vital, it must have fleet support—from commanding officers on down the chain.

Our challenge as Naval Aviators is to be better, more efficient operators. Improving mission effectiveness and the way we fly will enhance all of our capabilities.

LCdr. Buckley is Director, ACT Instructional Model Manager, at 904-452-2088, fax -2639; DSN prefix is 922.

Students develop scenarios and presentations in the ACT computer lab classroom.

Glenn A. Davis

Glenn A. Davis

Lt. Marty Rippenger and SSgt. Michael Hancock teach critical skills to an ACT class.

MCAS New River

By LCpl. David Brock

Tucked in the gentle, rolling hills of eastern North Carolina, amidst pine trees and beautiful white, sandy beaches, Marine Corps Air Station, New River, has had a tremendous impact on the surrounding community. Located five miles south of Jacksonville, the station has played a major role in Marine Corps aviation since it opened in April 1944.

Although 1944 is celebrated as New River's birth date, the air station's roots go further back. In 1941, the federal government purchased the land where Marine Corps Base, Camp Lejeune, and MCAS New River are today. The next year, Capt. Barnett Robinson of Marine Glider Group 71 surveyed the area around New River. His investigation concluded that the site was suitable for land- and seaplane operations.

The first squadron, Marine Bombing Squadron (VMB) 612, arrived in 1943. Its PBJ bombers were Army B-25 *Mitchells* modified for Marine use. VMB-612 remained here until being deployed to the Pacific in WW II. Shortly after their departure, the air station was established as Peterfield Point, named after a farmer whose tobacco field made up most of the land.

After the war, Peterfield Point reverted back to a caretaker status until being reopened in 1951 as Marine Corps Air Facility, Peterfield Point, Camp Lejeune. One year later it was renamed Marine Corps Air Facility, New River, after its eastern bordering river.

The first helicopters arrived in 1954 when Marine Aircraft Group (MAG) 26 moved here from Marine Corps Air Station, Cherry Point, N.C. The move began New River's permanent role in the Marine air/ground concept.

In 1968, the name changed once again to Marine Corps Air Station (Helicopter), New River. The change marked the air station's development from a small training base into a major tactical Marine airfield. The "Helicopter" designator was dropped in 1985.

Today, more than 4,000 marines and sailors operate with Marine Aircraft Group 26 and 29 and their assigned squadrons aboard the 2.3-square-mile air station.

The largest of the groups is MAG-26, which consists of one training, one support and six tactical squadrons. The group's aircraft include the AH-1W *Super Cobra*, UH-1N *Huey*, CH-46 *Sea Knight*, CH-53D *Sea Stallion* and the CH-53E *Super Stallion*. The group is the only one in the Marine Corps to have every type of fleet Marine helicopter.

The Marine Corps' only CH-46 training squadron is also part of MAG-26. Marine Helicopter Training Squadron (HMT) 204 trains officers and enlisted in the operation, maintenance and repair of "frogs." The squadron, the largest CH-46 squadron in the Marine Corps, recently surpassed 70,000 Class-A mishap-free flight hours, a remarkable accomplishment dating back to the squadron's beginning in 1972.

Leading the way in Marine aviation,

MCAS New River's front gate has changed significantly since this photo was taken in the late 1960s (above left). Today, visitors are welcomed with a familiar slogan.

New River and HMT-204 will soon be home to the MV-22 *Osprey*, when it is introduced into the Fleet Marine Force. Already, New River boasts the only MV-22 simulator in the Marine Corps.

One of MAG-26's squadrons, Marine Heavy Helicopter Squadron 362, will be leaving New River later this year. The squadron is moving to Marine Corps Base, Hawaii, from which all *Sea Stallion* squadrons will operate in the future.

While losing this squadron, MAG-26 will gain another squadron when HMT-302, the only CH-53 training squadron in the Marine Corps, relocates here from MCAS Tustin, Calif.

New River's other Marine Aircraft Group, MAG-29, was commissioned here in 1972. Although it doesn't have a training squadron or a CH-53D squadron, MAG-29 is capable of supporting any exercise or contingency directed by the 2d Marine Aircraft Wing (MAW).

Both groups work closely together and provide support for Camp Lejeune marines. Over the years, aircraft from the two groups have operated in hot spots all over the world, including Cuba, Lebanon, Haiti, Iraq and Saudi Arabia. These units are the most deployed aircraft groups in the Marine Corps.

Behind every good aircraft group, of course, is a good support squadron. Marine Wing Support Squadron (MWSS) 272, activated here in 1986, provides essential aviation ground support. The squadron's military occupational specialties—such as cooks, military policemen, engineers, communicators, motor transport operators, weather observers and refuelers—support the groups in many ways. As a result of their efforts, MWSS-272 was named the 2d MAW's Marine Wing Support Squadron of the Year for the period from 1 May 1994 to 30 April 1995

Another part of the supporting cast in the overall operations aboard New River is Marine Air Control Squadron 2, Air Traffic Control, Detachment B.

LCpl. David Brock

Aircraft from HMH-264 fly past the air station during workups for the 26th Marine Expeditionary Unit (Special Operations Capable). Top to bottom are a CH-53E Super Stallion, CH-46 Sea Knight, UH-1N Huey and an AH-1W Super Cobra.

The detachment's 61 marines play a vital role in providing air traffic control for the air station as well as maintaining gear such as field air traffic control towers and radar, and other gear for deployments.

Another command aboard New River is Headquarters and Headquarters Squadron (H&HS). The marines, sailors and civilians in the squadron make up the backbone of the air station's daily operations. The H&HS provides fuel, crash, fire and rescue and all other necessary personnel needed to run an air station.

Two UC-12B *Super King Airs* operate from New River's operations office. The twin-engine, turboprop planes fly missions assigned by the Air Transportation Coordination Office, Cherry Point, N.C., in support of a variety of East Coast users. There are only three other Marine Corps C-12s on the East Coast.

New River supports the community and environment around the air station in many ways. A recycling effort and other environmental programs protect and conserve the land, air and water surrounding the station. MCAS New River also provides the community with emergency response and medical evacuations using its aircraft when needed.

The air station offers many recreational activities for its residents. Its marina offers jet ski, canoe and sailboat rentals in the warmer months. Outdoorsmen can spend hours in the nearby woodlands, where several well-equipped campgrounds are located. And the many surrounding bodies of water provide opportunities for fresh or salt water fishing.

New River's award-winning Morale, Welfare and Recreation Department provides many services for air station personnel and their families. Entertainment is also available to New River residents at Camp Lejeune.

Nearby Jacksonville, N.C., serves as the business, retail, medical, banking and cultural center of Onslow County. Jacksonville offers several school systems for military dependents and a community college for continuing education.

Onslow County's population rose 134 percent in the 10 years after Camp Lejeune and New River opened their gates. The city of Jacksonville continues to grow, as does New River.

Working together, the personnel of MCAS New River and its Marine Aircraft Groups create a team spirit atmosphere for the premier Marine helicopter base on the East Coast. ■

The engineering maintenance shed in 1944 when the air station was known as Peterfield Point. During that time, the only aircraft here were the PBJ bombers flown by VMB-612.

The UH-1N Huey is an extremely versatile aircraft that has proven its capabilities in combat, search and rescue, utility combat support and command and control scenarios.

Two AH-1W Super Cobras from HMLA-269 maneuver in a landing zone while on a recent Mediterranean deployment.

WO1 N H North

A CH-53E Super Stallion lifts a CH-46E Sea Knight while off the coast of Somalia.

MCAS New River and Tenant Commands

CO MCAS: Col. Louis A Rehberger III
CO MAG-26: Col. Darrell A Browning
CO MAG-29: Col. Robert J. Wallace
CO H&HS: Lt. Col. Michael D. Jacobs
CO MWSS-272: Lt. Col. Michael C. Anderson

	(910)451- DSN 484-XXXX
Air Traffic Control	6657
Bachelor Officers Quarters	6621
Bachelor Staff NCO Quarters	6621
Bell Helicopter Representative	6599
Boeing Vertol Representative	6780
Commissary	6359
Dental Clinic	6077
Education Officer	6233
Headquarters, MCAS	6305
H&HS	6070
HMH-362	6805
HMH-461	6640
HMH-464	6162
HMLA-167	6222
HMLA-269	6877
HMM-162	6095
HMM-261	6485
HMM-263	6953
HMM-264	6888
HMM-266	6188
HMM-365	6550
HMT-204	6131
Joint Law Center	6386
Joint Reception Center	6508
MAG-26	6127
MAG-29	6427
MALS-26	6522
MALS-29	6717
MACS, ATC, Detachment B	6118
Marine Corps Exchange	0539
Medical Clinic	6532
MWSS-272	6732
Naval Aviation Engineering Support Unit	6841
Provost Marshal's Office	6111
Substance Abuse Counseling Center	6415
Sikorsky Representative	6070

NAS Fallon, Nev., will appear next in our Naval Air Station/Facility Series. Public Affairs Officers are encouraged to contact the Editor for scheduling.

Joint Tactical Combat Training System

The Joint Tactical Combat Training System (JTCTS) program is a joint U.S. Navy and Air Force (USN/USAF) effort to develop and procure tactical training range systems configured for mobile, fixed and transportable applications for both shore-based and deployed tactical training. JTCTS is intended to provide combat training of joint air and sea-based forces through a combination of simulated and real targets, instrumented aircraft and ship participants, and a network of radio-frequency and satellite data links. The design is the result of an intensive systems engineering activity focused on attaining the services' training goals in the most efficient way possible. JTCTS uses proven capabilities from existing shipboard, range and embedded training systems and incorporates available state-of-the-art technology for simulation, navigation and communications functions. JTCTS technology includes:

- Distributed processing to provide a flexible modular architecture.
- Global positioning system for accurate real participant positioning.
- Spread spectrum instrumentation data link for the necessary communications capability to allow JTCTS to operate in its diverse deployed environments.
- Very large scale integration/very high speed integrated circuit for processing, memory and size requirements.
- Integration of packet-oriented encryption for secure data links.
- Satellite communications for wide-area networking and interoperability.
- Digital weapon system interfaces for tactical system simulation/stimulation insertion and data monitoring capabilities.
- Distributed Interactive Simulation (DIS) protocols used for interoperability with other training systems and defense simulations. (The DIS interface will become the Department of Defense standard for training system interoperability.)

Using these technologies and commercial off-the-shelf/non-development item hardware and software, JTCTS is eminently practical. It can accommodate as many as 130 real participants and an additional 500 simulated participants, including ships, aircraft, submarines and shore sites within a 400 nm radius. Satellite communications permit the support of worldwide coordinated training exercises. When deployed, the JTCTS will provide the Navy and Air Force with a mainline tactical training capability.

The contract for the engineering and manufacturing development of the JTCTS was awarded to Raytheon Corporation, Portsmouth, R.I., on 6 March 1995. Subcontractors include ADT Incorporated, San Diego, Calif.; CAST, Los Alamitos, Calif.; and DYNCORP, Lexington Park, Md.

JTCTS has been under development since 1992 as the Tactical Combat Training System (TCTS) by the Tactical Training Ranges Program Office, PMA-248, in the Naval Air Systems Command (NAVAIR). PMA-248 develops, procures, fields and in some cases operates training range instrumentation worldwide. This instrumentation includes the Tactical Aircrew Combat Training System (TACTS), electronic warfare jammers/simulators, telemetry stations, range communications and operations equipment, and several underwater ranges. The TACTS system was featured in the movie *Top Gun*. The debriefing room scene in which Tom Cruise and the crew reviewed their training flights was not a Hollywood set, but was filmed at one of the actual TACTS display and debriefing locations on board NAS Miramar, Calif. Next-generation Top Gun training system capabilities will be provided as a part of JTCTS technology and equipment.

The TCTS and JACTS (Joint Aircrew Combat Training System) program offices began exploring opportunities for enhanced interoperability, including the possibility of a joint program, in late 1993. TCTS was being developed by the Navy for deployed battle force proficiency training and readiness assessment. JACTS was a joint USN/USAF program to upgrade the existing USN TACTS ranges and the USAF Air Combat Maneuvering Instrumentation (ACMI) ranges.

The result of combining these efforts into a single JTCTS program is that all ranges currently using ACMI, TACTS or Large Area Tracking Range equipment will be upgraded to JTCTS. The only exception is that the USAF range at Nellis AFB, Nev., will receive an interim upgrade, already under way, and will eventually be included under the JTCTS program. In addition, JTCTS will procure mobile, fixed and transportable applications, all of which are based on the original TCTS architecture. The mobile application is the original TCTS deployable system. The fixed application is for eventual installation at all USN TACTS ranges and USAF Air Combat Training System ranges. The transportable application is an Air Force-peculiar version of the fixed configuration.

The JTCTS mobile application will provide full battle force training across

all warfare areas for air, ship and submarine crews. It will be comprised of a core participant instrumentation package for the air/surface/subsurface platforms, and display/debriefing units. The JTCTS fixed application is similar to the mobile application except that it will be permanently installed at shore-based ranges, such as Fallon, Nev.; Yuma, Ariz.; Beaufort, S.C.; and the emerging Littoral Warfare Training Complex centered at Cherry Point, N.C. The transportable application is similar to the fixed application except that it can be packed up for transportation to various ranges as required.

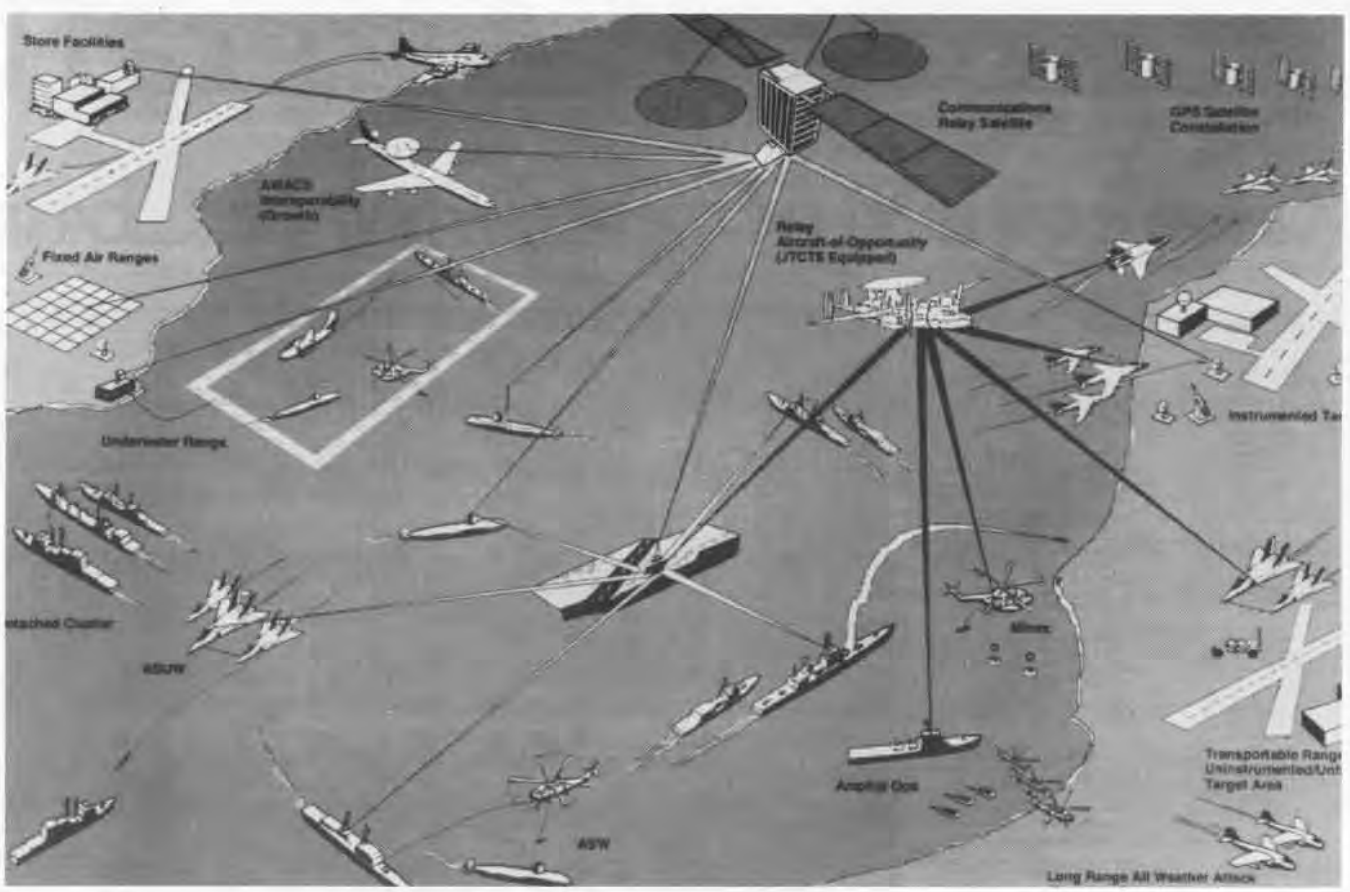
JTCTS will provide workup, proficiency and deployment training; tactics development; and readiness assessments for the fleet and for USAF operational units. It supports actual air, surface and subsurface platforms (separately or in combination depending on the application) executing planned tactical scenarios in a dynamic operational environment. This means that aircraft are flying and ships are steaming as they would under actual battle conditions.

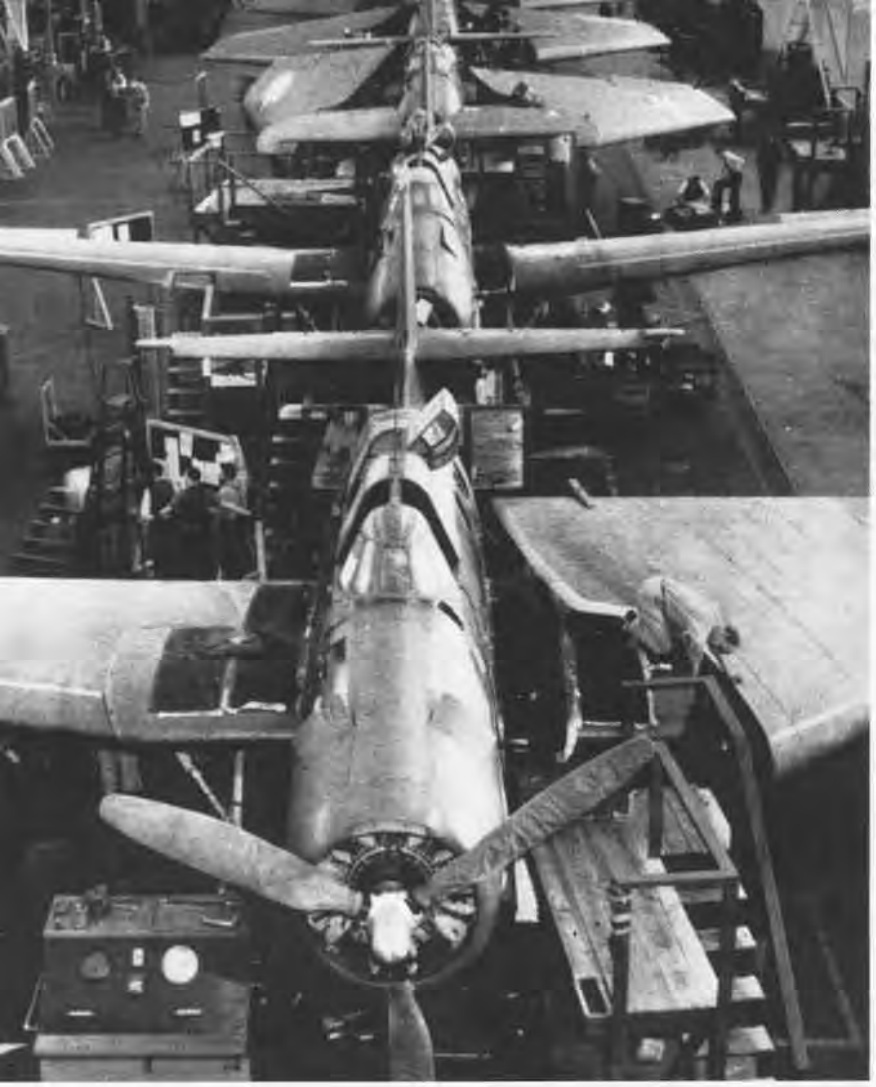
"JTCTS is clearly the future of affordable multiwarfare tactical training," said Joseph W. Heineman, NAVAIR's Tactical Training Range program manager. "Especially in the context of reduced budgets, smaller force structures and changing threats, JTCTS will provide a standard, flexible, comprehensive training tool that will optimize 'in-the-cockpit, at-the-helm' training well into the 21st century." ■

The Naval Air Systems Command PMA-248 staff contributed this article.

This illustration shows the wide-range capabilities of JTCTS.

Joint Tactical Combat Training System





Down the final crane bay at Trenton, N.J., come the nearly completed Avenger torpedo-bombers to receive paint, propellers, radio equipment and the other finishing touches that will make them first-class fighting machines. Folding wings are tested, too.

From Autos to Aircraft:

General Motors' WW II Conve

By Robert L. Caleo

Automobile companies were asked to manufacture 75 percent of the engines required for combat aircraft during WW II, but only two of their operations took on the job of building complete airplanes. Ford Motor Company produced B-24 bombers for the Army in a new, custom-built plant at Willow Run, Mich., while General Motors (GM) converted existing facilities in New Jersey, New York and Maryland into carrier-plane sources for the Navy.

Though GM's effort has received less historical attention than Ford's, it was more successful in terms of at least one quality criterion. Its facilities consistently met the Navy's delivery schedules; Ford's production, on the other hand, lagged for a time.

GM's real competition, though, was half the world away at the *Zero* fighter plants of Mitsubishi Heavy Industries and Nakajima Aircraft Company, headquartered in Tokyo, Japan. Just six weeks after Pearl Harbor, the Navy enlisted GM to make both fighters and torpedo-bombers for its carriers, as well as some for the British. Many of

Wildcats in various stages of completion move through the vast, high-vaulted final assembly bay at Linden, N.J.—illustrating the amount of activity going on every day in a wartime aircraft plant.

Workers at Bloomfield, N.J., demonstrate how air under pressure is shot through each tube to check for obstructions or imperfections. Many hundreds of these tubes go into each plane.

the planes were destined for the Pacific and inevitable encounters with Japan's small but deadly *Zeros*.

The fast-climbing, highly maneuverable enemy fighters were initially a surprise to most Americans. Yet, when they appeared at Pearl Harbor they were already battle tested, having earlier outperformed China's American-, British- and Russian-built warplanes.

To the Japanese, the *Zero* represented more than a weapon. It was almost a state of mind. The pilots who flew the single-seat fighters likened them to skyborne samurai swords, and as *Zero* designer Jiro Horikoshi divulged after the war, Japan's military strategists originally believed "one *Zero* would be the equal of from two to five enemy fighter planes, depending on the type."

Little more than a month after Pearl Harbor, waves of *Zeros* were already spearheading attacks on New Guinea and the Solomon Islands—gateways to Australia. Before that, they had supported invasions of Guam, the Philippines, Malaya, the Dutch East Indies and Wake Island. Operating from island bases and aircraft carriers, they seemed to be everywhere in sizable numbers, escorting bombers and troop ships, strafing airfields and antiaircraft batteries and generally overwhelming the U.S. and British planes confronting them.

Desperate to gain air-sea supremacy in the Pacific and to counter the German U-boat menace in the Atlantic, the Navy arranged an extraordinary liaison between giant General Motors

rsion to Wildcats and Avengers

and the much smaller, suddenly overcomitted carrier-plane developer, Grumman Aircraft Engineering Corporation. The duo's mission, with GM in the unlikely role of second contractor, was to lift America's naval aircraft production to the levels demanded by a two-ocean war.

Curiously, the Navy's paired-production strategy paralleled one the Japanese had already adopted. Since 1939 Nakajima, then the leading aircraft manufacturer in Japan, had been mass producing the basic *Zero*, while Mitsubishi, the fighter's developer, concentrated on improved models. In the U.S. scheme, General Motors—not an aircraft

The old automobile final assembly line at Linden, N.J., was used temporarily to train workers in aircraft production. Everyone learned something new—inspection, rivet sorting and welding (shown here).

By using this ingenious upper-deck platform at the Tarrytown, N.J., plant, employees on the wing conveyor line are able to quickly put final touches on one of the largest bomber assemblies. The width of the wing requires this unique apparatus.

Senator Harry Truman and his Senate Investigating Committee visited the Trenton and Linden, N.J., plants on 15–16 March 1943; they were impressed with the speed and completeness of the conversion from automobiles to planes.

firm but the world's top auto maker—was contracted to assume production of Grumman *Wildcats* and *Avengers* so that the source company could work on a new, more advanced plane.

The crucial questions for the Navy's Bureau of Aeronautics, the contracting agency, were: Could GM apply the auto industry's celebrated manufacturing skills to plane making, and could that be done fast enough to affect the course of the war, particularly in the Pacific? There seemed to be little doubt about the answers at the leader level.

Donald M. Nelson, the nation's War Production Board chairman, maintained that "when the war started there were not more than three countries, outside of the United States, whose entire industrial war-making potential was greater than that of the American automobile industry."

According to GM chairman Alfred P. Sloan, his corporation's objective was "to transform the world's largest automobile company into the world's largest manufacturer of materials for war" and in doing so to take on "the most complicated and difficult production assignments."

Nowhere was GM expertise challenged more than in the East Coast operation

An aircraft's "skin," already fastened, is riveted to the cone-like frame of the rear fuselage by workers at the Baltimore, Md., plant.

set up to make the Grumman-designed aircraft. Plants at Linden, Trenton and Bloomfield, N.J.; Tarrytown, N.Y.; and Baltimore, Md., were merged into an ad hoc GM division called Eastern Aircraft. The Navy's contract called for the new unit to produce its first fighters and bombers by the fall of 1942, meaning that it was being asked to convert from autos to aircraft in less than half the time it normally took to develop a new car model.

To get started, Eastern had to first tear down some highly productive assembly and parts lines—ironically, the kinds of facilities that had attracted the Navy. Before the war the Linden plant had been one of the world's most advanced car assembly factories, turning out Buicks, Oldsmobiles and Pontiacs at a peak rate of one per minute. Trenton, a hardware facility, had produced as many as 750,000 door locks, hinges, trim moldings and the like per day.

For the Navy, Linden would switch to assembling *Wildcat* fighters and Trenton to *Avenger* torpedo-bombers They were supported by a Delco-Remy battery plant at Bloomfield and Fisher Body-Chevrolet factories in Tarrytown and Baltimore. These plants were responsible for subassemblies, such as wings, tails, cockpits and electrical systems.

All of the plants had to undergo procedural and work-force transformations as well as physical ones. Eastern needed to form a new supplier network of more than 3,000 subcontractors to obtain aircraft materials and parts. The division's 9,000 employees required retraining provided by nearby plane manufacturers, colleges and vocational schools. And, because plane making was still a more manual process than auto making, the work force had to be more than doubled and staffed mainly with unskilled emergency recruits who required basic tools instruction.

Eastern overall could best be characterized as an "apprentice," or learning organization, in 1942. Its general manager, Louis "Cliff" Goad, said as much the following year in an article on the division's conversion written for *Flying Magazine*: "Let me confess at the outset that I am a 'Johnny-Come-Lately' to aircraft production. My entire career has been devoted to problems of automotive manufacture, most of it in the accessory business. In the matter of how to produce spark plugs or batteries, I could speak with some authority. In the complex field of aircraft manufacture, I don't pretend to know all the answers. But for the last year, we have been finding them the hard way—working around the clock, immersed to our necks in machines, techniques, and nomenclature unknown to us 12 months ago."

Goad and staff had come to their new business steeped in the principles and practices of standardized mass production—the process of translating well-documented designs into precisely machined parts that could be rapidly joined into replicated products on mechanized assembly lines. Their reorientation began soon after Eastern Aircraft was formed when they asked Grumman for complete parts lists and engineering data for the *Wildcats* and *Avengers*.

In the automotive process, designers had normally directed material buyers and machine tool makers through fully detailed requisitions and drawings. At aircraft firms, however, extensive use was made of hand tailoring by highly skilled mechanics guided by discussions with engineers and sketches. Purchasing requirements had often been communicated the same way.

As Eastern unhappily learned, many of the specifications it needed were in workers' heads at Grumman's plants at Bethpage, Long Island, N.Y.

Splash! Mary Martin, star of Broadway and Hollywood, christened the 2,500th Wildcat in a ceremony for employees.

Supervisors from each of the division's facilities were quickly sent to Grumman to dig for the information. They used every possible research approach, from asking questions, peering over shoulders and taking notes to studying drawings and files, measuring finished parts and photographing components and assemblies. Key specifications were immediately phoned back to Eastern, which gave buyers there a head start in setting up the nationwide supply lines necessary to procure some 10,000 different aircraft parts.

Grumman itself became Eastern's first supplier. Because the Navy insisted, for maintenance reasons, that the two manufacturers produce planes with interchangeable assemblies, it was

It started with a coin and grew to $5,256 when Linden, N.J., workers, in a spontaneous demonstration, stuck their cash around an Eastern Wildcat for the Navy Relief Fund.

decided that one more step should be taken to guide Eastern. Grumman shipped finished *Wildcats* and *Avengers*, with major parts held together by temporary fasteners, to Linden and Trenton, respectively. The parts could be easily removed for measurement and analysis by tooling machine designers, assembly line planners and other engineers at Eastern.

Unfortunately, this reverse-engineering tactic only illustrated how soft aircraft standards were. Many of the model components did not conform to the specifications on Grumman drawings examined earlier, and some even differed from ready-made parts that the Long Island company began sending to Linden and Trenton to help Eastern build its first planes.

This snag in its search for basic data marked the lowest point in Eastern's first year of operation, according to the division's official history. Eastern was then in its third month, with only six left for delivery of its initial *Wildcat* and seven left for the *Avenger*. Its production departments were ordered to construct the first few planes in the aircraft industry's job-shop style, while the division's engineers painstakingly developed the data needed to tool up for mass production.

The engineers adopted an idea that aircraft firms had borrowed from shipbuilders. They laid out full-scale outlines of the *Wildcat* and *Avenger* and doggedly, over a period of months, filled them in with drawings of the thousands of parts involved. Each of the parts was drawn to the exact size desired in production; thus, purchasing and tooling standards were finally set and documented.

While solving its start-up problem, Eastern was faced with a more profound dilemma, which Goad described this way: "In the automobile a given design is fixed over a definite and fairly long period. The design of a modern warplane is fluid. It can be changed on a moment's notice—and is. That is probably one point most of us in the automobile industry failed fully to appreciate in the beginning."

Goad's words do not convey the jolt that his engineers felt when they realized a cornerstone of GM practice—freezing designs to maximize output—would not be transferable to their evolving wartime operation. Eastern began receiving Navy requests for changes in both *Wildcats* and *Avengers* while still gearing up for production.

A number of the modifications resulted from growing knowledge about the *Zero*, which in effect became a benchmark for the Grumman-Eastern tandem in the early part of the war. For Eastern this was one more start-up hurdle. It involved making 4,000 engineering revisions beginning with the eleventh *Wildcat* assembled at Linden.

Though the stubby *Wildcat* could rarely match the *Zero* in one-on-one dogfights, it was rugged enough to expose some weaknesses in the enemy plane. As a marine pilot at Guadalcanal put it, "A Grumman [*Wildcat*] can sometimes take [long-term] fire from a *Zero*, but the *Zero* can't take two seconds' fire from a Grumman."

The explanation came when Navy engineers had an opportunity to evaluate a captured *Zero*. Apparently, to achieve superior speed and manueverability, Mitsubishi had minimized its fighter's weight—trading off armor plating in crucial areas, such as the cockpit. Further, the *Zero* had not been equipped with self-sealing fuel tanks, which were standard safeguards in the Grumman-designed fighters.

During its first six months of production, the division received orders for over 100 design changes, including adding more guns to the wings of the *Avenger*. To cope with such volatility, Eastern abandoned a core practice of the auto industry. With locked-in car designs and large-volume runs, it had been expedient to use highly specialized machine tools, each doing a single job rapidly and economically. To build ever-changing warplanes, Eastern had to switch to more pliable machines capable of performing, or being converted to, different tasks.

"Over a period of months, Eastern Aircraft was going to violate nearly all of the sacred precepts of mass production philosophy, but of these violations and compromises a new technique of manufacturing was born," the division's history noted. Goad presented further perspective during a press conference held in December 1942 to mark his organization's successful changeover to producing complete combat aircraft—the first such conversion of auto industry facilities in the nation. With GM chairman Sloan at his side, Eastern's general manager began by establishing realistic expectations for his hybrid operation.

"It is safe to say we cannot now and probably never will see during this war mass production of aircraft as we knew it in the automotive industry," he told some 100 journalists in discussing the "constant, even feverish improvements" required in military planes. But, he reassured them, Eastern's production would be high enough to meet the Navy's needs.

Touring the Linden and Trenton plants, the reporters saw some of the reasons for Goad's optimism. Conveyors, monorails and other flow-enhancing mechanization—hallmarks of the auto

The new FM-2, known as the "wilder" Wildcat, made its debut for members of the press in the Linden, N.J., hangar. A huge, realistic paper-and-wooden circus wagon housed the 'cat before it broke loose.

industry—were being put to work in the plane-assembly process. Giving its impressions the next day, the *New York Times* wrote: "The task of changeover has been a colossal one. . . . Of even greater significance than the physical and technical transformation is the success with which the techniques of scheduled flow of material through a plant have been applied to structures like fighters and bombers. . . . Eastern Aircraft is at once a testimony to the cooperation and the 'know-how' of both aircraft and automobile management and a harbinger of even finer performance for war and for postwar industry."

Eastern at that point had exceeded its production target for 1942 by delivering over 20 planes to the Navy—twice the number expected in its start-up year. In its journeyman year, however, the target set by the Navy skyrocketed to four figures. The division was charged, in 1943, with driving its production high enough to relieve Grumman for full-time work on the ultimate *Zero* killer, the new *Hellcat* fighter.

Concurrently, Eastern faced yet another conversion. The Navy needed a smaller, lighter, faster climbing version of the *Wildcat* for its versatile escort carriers—the "baby flattops" comprising shortened flight decks on freighter-size hulls. Escorts were already being used effectively in the Atlantic by both U.S. and British fleets for convoy protection and air-sea pursuit of German submarines. They were destined to play a vital role in the island-by-island takeback of the Pacific, serving as offshore bases for planes—usually *Wildcats* and *Avengers*—supporting amphibious forces.

Operating from the escorts, the new *Wildcats* would become feared island attackers during the second half of the war, much as the *Zeros* were earlier. The design for the model, called the FM-2, was handed off from Grumman to Eastern early in 1943. By the end of the year, Linden had assembled over 300 FM-2s, plus 1,100 of the earlier *Wildcats*, the last FM-1s produced for the U.S. and British navies.

For Linden, according to Eastern's history, the *Wildcat* changeover was "fully as great as changing from one year's model to the next in automotive manufacture—except that in this case the plant could not shut down to retool." Because of the Navy's escalating demands, there could be no production gap between models. In fact, Linden's output had to keep rising while a seamless transition was made.

Just as the plant had intermingled Buicks, Oldsmobiles and Pontiacs on its prewar assembly line, it built FM-1s and FM-2s simultaneously for part of the war. Gradually, the former were phased out as greater numbers of the "wilder *Wildcats*"—Eastern's nickname for the peppier FM-2s—were put into the production stream.

As Linden engineered its nonstop cutover, Trenton was teaming with the division's other plants to keep up with soaring orders for the *Avenger*. The three-man torpedo bomber, one of the war's biggest single-engine planes, had fast become the heavy hitter on U.S. carriers after making its debut at Midway. With its 2,000-pound torpedo or equivalent bomb load, it could pound ships, submarines and land facilities.

The *Avengers* could not be readily manufactured under a single Eastern roof. The bombers' dimensions and their complexities, such as built-in bomb bays, motorized gun turrets and folding wings, dictated that they be constructed modularly. Baltimore produced the tail sections, Bloomfield the electrical and hydraulic systems and Tarrytown the cockpits and wings. Finished components were shipped to Trenton, where they were joined to fuselages on a final assembly line.

Two weeks before Christmas 1943, Eastern presented its 1,000th *Avenger* to the Navy, and the following month it assumed sole responsibility for the bomber's production. At a Trenton ceremony, the plant's manager promised that the next 1,000 *Avengers* would be delivered in one-third the time.

The division's progress and confidence were manifestations of its transition from learner to sharer in the wartime aircraft industry. By 1944 all of its plants reflected GM's proficiency at developing coordinated, continuous manufacturing operations.

"The learning process that resulted from the cooperative effort of Grumman and GM was by no means a one-way street," wrote Richard Thruelsen years later in his history of the Long Island company. "Grumman also learned from the GM production experts, particularly in the fields of tooling, automation and production-line dynamics. The lessons were opportune for Grumman, with its vast influx of inexperienced and unskilled workers. . . . The machine and the system had to fill the gap created by a shortage of highly skilled labor."

The Baltimore, Md., final assembly line at shift change. A long line of Avenger tail sections parade through this area day and night. The finished products are whisked away from the end of the line and shipped to Trenton, N.J.

Grumman and Eastern made a total of some 35,000 planes during the war, the bulk of the Navy's carrier aircraft. When their combined volume peaked in 1944, the second contractor's production exceeded the original contractor's. The Navy rated Eastern's product quality as "the equal of the best in the industry." Further, GM's division by then was the highest producer of naval aircraft in the world, surpassing even Nakajima, whose output of *Zeros* and carrier-based bombers was being retarded by severe material shortages.

Eastern was the source of more than three-quarters of the nearly 18,000 *Wildcats* and *Avengers* delivered in the war years. Significantly, it became a top producer in time for the Navy's climactic Pacific offensive, beginning with the invasion of Kwajalein early in 1944 and ending with the occupation of Okinawa—on Japan's doorstep—in mid-1945. Aircraft out of Linden and Trenton supported every major assault and helped turn back the Japanese navy at Leyte Gulf in the Philippines, in the war's last and biggest sea battle.

Meanwhile, the once-exalted *Zero* was headed for oblivion. Late in 1944, south of Leyte, 10 of the Japanese fighters carrying 550-pound bombs crashed down on a group of escort carriers, damaging several and sinking one. This was the first of many planned kamikaze attacks by *Zero* pilots.

Japan's suicide missions were partly the result of the peaking production lines at Eastern, Grumman and other U.S. aircraft companies. As American warplanes improved and proliferated, they took control of the Pacific skies, reducing the *Zero*, with its few remaining experienced pilots, to a desperate role.

The *Zero's* downfall is generally attributed to the Navy's Grumman *Hellcat* and Chance Vought *Corsair* fighters, but the *Wildcats* and *Avengers* must share the credit. *Avengers*, not a direct threat to the Japanese fighters, often undermined them by bombing their island bases as well as their carriers. Future President George Bush, one of the Navy's *Avenger* pilots, was engaged in raids on airstrips and radio facilities in the Bonin Islands when he was forced to ditch his bomber in September 1944.

The next year, as the war moved closer to Japan, *Avengers* were used in some carrier-plane attacks on Tokyo-area airfields and airplane plants. By that time Nakajima and Mitsubishi operations were being disrupted by regular B-29 poundings, which damaged factories and slowed supply deliveries, compounding the material shortage problem.

In the end, after a considerable head start, Japan's aircraft manufacturers found themselves unable to produce enough reliable *Zeros* or other planes to defend their country against the superior U.S.-produced aircraft. ■

Mr. Caleo has had a career in magazine editing combined with work in public relations, records and information analysis, and teaching. A retired businessman now teaching and writing, he lives in Bayonne, N.J.

Photos courtesy of *A History of Eastern Aircraft Division, General Motors Corporation, 1944.*

NANews Editor Retires

By JO2 Blake Towler

After being on the job for two years that went by too fast, the latest in a long line of *Naval Aviation News* editors steps down. On 14 July 1995, Commander Russ Jowers will leave both the magazine staff and a long and illustrious naval career.

A native of northern Louisiana, Jowers first entered military service as an Army helicopter pilot. After serving two tours in Vietnam, Jowers left the military to finish his education, majoring in General Studies at Northeast Louisiana University, and then reentered the armed services—but this time as a Navy helicopter pilot.

Jowers served in various positions in the LAMPS (Light Airborne Multi-Purpose System) antisubmarine warfare helicopter community. He was involved in operations with the Marines in Beirut and in Grenada and, more recently, worked for NATO out of Naples, Italy. During this period he earned a master's degree in Business from Central Michigan University. In June 1993 he became Editor of *Naval Aviation News*—quite a change of pace for a helo jock. "I had absolutely no publishing or editing experience prior to this assignment," Jowers admitted. Despite this and the fact that he would have to read and publish stories about *fixed wing* aircraft, he embraced the job and has done remarkable work. While he claims he "couldn't have done the job without such a superb staff," it is the staff who will miss Cdr. Jowers' guidance and exceptional professionalism—as well as his feisty attitude and sharp wit.

Managing Editor Sandy Russell said, "We really lucked out when Cdr. Jowers received this assignment. For someone without a journalistic background, he turned out to be an excellent writer and editor. I have a lot of respect for him both professionally and personally. He's not only been a super boss, but he's become a good friend. Selfishly, we don't want to see him go. But it's great that he will remain in the Washington area, so he can still join us for lunch!"

"It's been a lot of hard work," Jowers said, "but it's the greatest job I've ever had. It's been very rewarding to me personally, and I feel I've really contributed to the Naval Aviation community since I've been here."

The staff of *Naval Aviation News* is truly saddened to see Cdr. Jowers head for retirement, but we wish him the best of luck in his future, which he says will include "real estate sales and fishing."

Vapor Trails

The following is a synopsis of Mr. Thomas S. Momiyama's "Farewell to Naval Aviation" upon his retirement 3 February 1995 as Head, Air Vehicle Technology Office, Naval Air Systems Command (NAVAIR), Washington, D.C.

With utmost respect and profound comradeship, I salute you. You have been my colleagues, teammates, teachers and leaders. But most of all, you have been my friends, with whom I shared the common goal of making our carrier Navy the best that technology can give.

Many of you I met on carrier flight decks while I was a Pax River flight tester as we pushed the limits of our new airplanes. I remember your faces and your colored jerseys. You've got the teamwork no NFL team can match. The nation should be proud of you.

My test pilot friends, after risking your life in one-of-a-kind test flights, you went back to sea and risked your life for your country as warriors.

Fellow flight test engineers, how could any other job be as exciting and rewarding as reading a fleet message calling the new landing aid you developed and demonstrated "a genuine breakthrough in naval aviation"?

My colleagues in NAVAIR, many of you are fighting a courageous battle of personal and professional survival. YOU are Naval Aviation—not the inanimate organizations nor those articulated "visions" on paper. Our high-tech weapons and airplanes are mere pieces of machinery until you infuse in them your care, dedication and dream. I pass on to you words of one of my respected leaders, Admiral [Richard C.] Gentz: "Naval Aviation is a half-filled glass. There will be a proper time to fill it. Hang in there."

I am grateful to Naval Aviation for what it has been to me and what it has made me. For a kid from war-torn Japan, where there was no future for his dreams in aviation, a GS-5 flight test engineer's job in the U.S. Navy was a dream come true. My heart pounded as I looked up at the needle nose of the F8U *Crusader* that John Glenn had just sped across the continent to establish a speed record. That was my first day at Pax River and the first day of 37 years of continuous excitement.

One grows up fast in flight test engineering. You learn to be honest with yourself and not to compromise for personal or political expediency, because "cheating" in engineering could cost lives.

My second career "to work on the future" developed in NAVAIR's Research & Technology Group. Technologies come in small doses, and each one took a special coalition of experts to succeed—including my colleagues from Navy laboratories, NASA, academia, foreign countries and aviation industries around the globe.

As I leave Naval Aviation, I can now be an aviation citizen and my own ambassador. People and nations need to work together in pushing aviation's technology edge. I hope I can contribute to a mutual understanding. When engineers talk, we talk straight. [W. Edwards] Deming needed not teach us the concept of teamwork. We have been the best team in the world for over 80 years. We argue because we have the guts to hammer out consensus. We know there are many ways to fly an airplane and that political correctness isn't one of them.

Thank you, my friends. I shall see you in the sky.

Okinawa: A Living Legacy

By John C. Reilly
Head, Ships' History Branch, Naval Historical Center

But the most important aspect [of the Okinawa operation], so far as the Marine Corps was concerned, was that once more the air arm had justified brilliantly the basic reason for its existence: support of the ground forces on the field of battle.

—Major Frank O. Hough, USMCR, *The Island War* (1947).

The Ryukyus, also called the Nansei Shoto, are five groups of islands reaching in a 650-mile arc from the southern tip of Japan nearly to Formosa and dividing the East China Sea from the Philippine Sea. The Osumi Gunto, Tokara Gunto, and Amami Gunto groups lie to the north. The central group is Okinawa Gunto, with Sakishima Gunto to the south. The Ryukyus had numerous airfields, located within fighter and bomber range of Formosa and Japan, as well as harbors and anchorages used by the Japanese navy. An Allied foothold in the Ryukyus would separate Japan from Formosa, and provide a base for operations in the East China Sea and against Japanese communications with Korea. Airfields in these islands would also give the Army Air Forces another springboard from which to attack targets in Japan. Okinawa, the principal island of Okinawa Gunto and of the entire chain, is nearly 60 miles long, narrow and irregularly shaped. Its 467 square miles, much of this rough and overgrown, made it naturally defensible, while its two airfields made it a worthwhile objective.

In October 1944 the Joint Chiefs of Staff decided that, once the Philippines had been freed, the next targets of the island-hopping campaign would be Iwo Jima and Okinawa. The bitter fight for Iwo Jima ended when the island was secured on 16 March 1945. Two days before this, Vice Admiral Marc Mitscher sailed from Ulithi with Task Force (TF) 58 to open the Okinawa operation with strikes at the Japanese home islands as Army B-29 *Superfortresses* from the Marianas struck targets in Kyushu, southern Honshu and the northern Ryukyus. Intelligence estimates placed available Japanese air strength at 2,000–3,000 planes and predicted all-out opposition to any move against Okinawa. Most of the first-line Japanese air strength was thought to be concentrated on airfields in the southernmost Japanese island of Kyushu, while reconnaissance showed the bulk of what remained of the Japanese fleet to be at the Inland Sea bases of Kobe and Kure. Mitscher hoped his

Carrier planes hit Naha, on Southern Okinawa.
285653

powerful opening strike would destroy large numbers of Japanese planes, but knew that the best he could do was to diminish, rather than eliminate, the enemy's air capability. Once the strikes were over, TF 58 would then turn to preinvasion softening of Okinawa and heavy fighter protection of the landing force until enough land-based fighters could be deployed to defend the island.

Navy and Marine air were out in strength. Task Force 58's four task groups, with 11 fleet carriers—10 *Essex*-class and the veteran *Enterprise* (CV 6)—and 6 *Independence*-class small carriers, mustered 1,161 planes. Over 70 percent of these were fighters; about a quarter of those were bomb- and rocket-carrying F4U *Corsairs* and F6F *Hellcats* assigned to the new bombing-fighting squadrons. These helped maintain the carriers' strike capability while strengthening the fighter complements made increasingly essential by the kamikaze menace. The remaining 30 percent were attack planes, SB2C *Helldivers* and TBF/TBM *Avengers*. Carriers *Bennington* (CV 20) and *Bunker Hill* (CV 17) each carried two squadrons of Marine Corps *Corsairs*. *Enterprise*, which had been operating as a "night carrier" since the Luzon invasion, carried a squadron each of radar-equipped *Hellcats* and *Avengers* for dusk combat air patrol (CAP).

The amphibious force's close air support came from its Support Carrier Group under Rear Admiral Calvin Durgin—18 escort carriers with 343 *Hellcats* and improved FM-2 *Wildcats*, and 197 Avengers. Three more "jeep carriers" transported two Marine air groups, with 222 *Corsairs* and *Hellcats*, scheduled to fly into Okinawa airstrips four days after the first landing. Four patrol bomber squadrons flew 12 PBM *Mariners* apiece and were supported by 6 large and small seaplane tenders. Another small seaplane tender had the care of VH-3, an air-sea rescue squadron with 6 PBM-3Rs, transport versions of the *Mariner*. Three old "four-stack" destroyers, converted to small seaplane tenders, assisted the larger tenders.

Landing beaches were selected to ensure capture of Okinawa's two airfields by L-day plus 3 so the Marine air groups could fly in the following

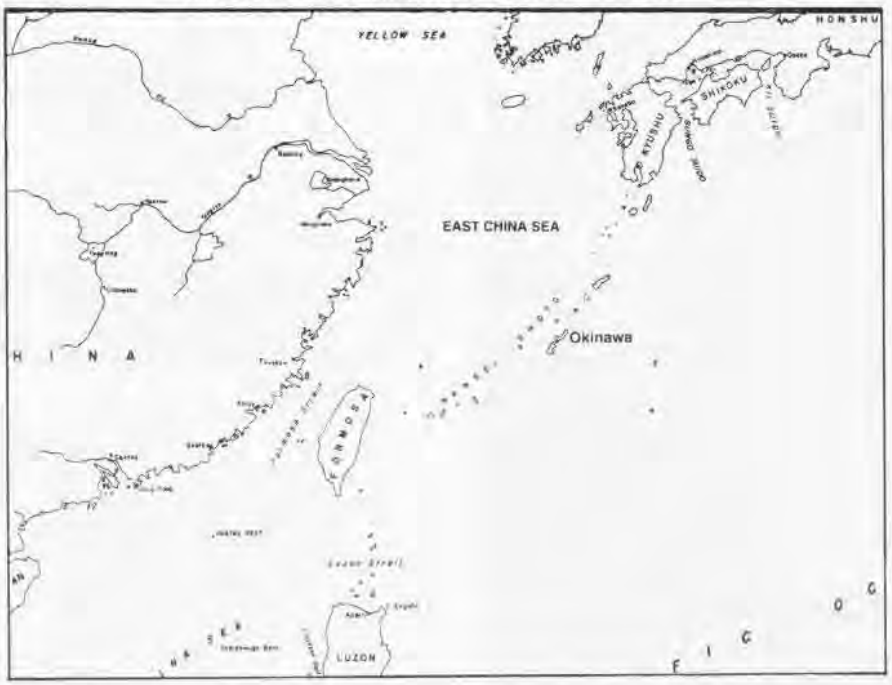
After a relatively easy beginning, the fight for Okinawa turned into one of the most intense of the war.
316903

day. Land-based air support would be needed as soon as possible to reinforce the ground forces so carrier planes could concentrate on what would now be called theater air defense. If all went well, nearly 1,400 American fighters would be on hand in the Okinawa area by L-day plus 4.

When he headed for Okinawa, Mitscher knew that he was in for a long campaign. Planners predicted that it would take two months before the island could be considered secured, meaning that the carriers could look forward to some two and a half months of steaming from the time they put to sea. Unlike earlier objectives, Okinawa lay in Japan's home waters, within easy flying range of large numbers of Japanese airfields in southern Japan, Formosa and mainland China, as well as smaller bases in the closer Sakishima Gunto and Amami Gunto island groups. Suicide attack was now an established fact of life at sea, and running interference for the Okinawa invasion would be a full-time job and more for the fast carriers.

Even before Task Force 58 could sortie from Ulithi, a suicider hit *Randolph* (CV 15), putting her out of action until 7 April. The rest of the force headed for Japan, striking targets on Kyushu on 18 March. The carrier flyers claimed more than 100 planes destroyed on the ground, with many more "probables," and another 77 planes destroyed in the air. Early morning sweeps included photoreconnaissance planes, and their films were quickly developed to reveal planes in revetments or under camouflage. This allowed later strikes to go directly for chosen targets rather than orbiting

Western Pacific 1944–1945



defended fields looking for something to attack.

The Japanese had gotten wind of TF 58's approach, and many of their planes were already in the air; *Enterprise* and *Yorktown* (CV 10) took bomb hits, while a kamikaze near-miss inflicted damage and casualties on *Intrepid* (CV 11). The next day, strikes on the Inland Sea damaged 16 Japanese ships, but again there was a price. An unspotted Japanese plane hit *Wasp* (CV 18) with a bomb that set fires, ruptured gasoline and water lines, and killed or wounded 370 men. Her crew fought back, putting the fires out in 15 minutes and getting the flight deck back into operation in less than an hour. In spite of her wounds, *Wasp* stayed on station for several more days before turning back for repairs.

Franklin (CV 13) was not so lucky. At the same time *Wasp* was hit, another undetected Japanese plane dropped two bombs that penetrated the carrier's unarmored flight deck to explode on her hangar deck. Both decks were crowded with armed and fueled planes preparing to launch for the day's strikes; fires and a long series of secondary explosions devastated the decks and killed hundreds. The embarked task group commander shifted his flag to another carrier and advised *Franklin's* commanding officer to get ready to abandon ship.

The CO thought otherwise. He ordered all but key personnel into the water, staying on board with his cadre to fight the flames. Cruiser *Santa Fe* (CL 60) pushed herself against *Franklin's* side and held station there for three hours, taking on wounded and helping the carrier's firefighters. Hours of heroic effort paid off; the fires came under control, and another cruiser took *Franklin* in tow and began to retire under a CAP of fighters. In the early hours of the next day the carrier began to get her engineering plant working. Shortly after noon she cast off her tow and continued under her own steam, eventually arriving at New York for repairs. *Franklin* had suffered dreadfully, losing 724 killed or missing and 265 wounded while taking the kind of damage that had sent carriers to the bottom in 1942—but she had survived. Incredible courage, combined with vastly improved wartime damage control tools and training, had created a legend.

Task Force 58 headed south as fighters ranged over Kyushu to forestall further attacks. During the afternoon of 20 March a kamikaze, hit by antiair-

F6Fs prepare to launch from Yorktown (CV 10). Introduction of fighter-bomber versions of the Hellcat and Corsair let carriers increase fighter strength without compromising strike capability.
001474

craft fire from *Hancock* (CV 19), missed the carrier but struck a nearby destroyer; a bomber later missed *Enterprise*, but gunfire from her screen set fires on her flight deck. During the following afternoon, a 48-plane raid was detected. Eighteen of the attackers were twin-engined torpedo bombers carrying rocket-powered piloted bombs, poetically called *Oka* (cherry blossom) by the Japanese; the American fleet dubbed them "*baka* (crazy) bombs." Carrier fighters intercepted the raid and struck the *Oka* carriers before they could launch their weapons.

Mitscher now reorganized his task force, sent the damaged carriers back to Ulithi for repairs, and began to strike Okinawa on 23 March. The amphibious force's "gunships" joined the fast battleships of the carrier force off Okinawa the following day to begin the prelanding bombardment. An Army landing force seized the lightly defended Kerama Retto, a group of small islands west of Okinawa, to create a base for seaplanes and logistics ships. As the Okinawa operation went on, Kerama Retto would prove invaluable for advanced battle damage repairs to ships of the attack force.

At this opportune moment a force of five British carriers arrived on station, ready to fight, on the 25th. The British carriers were somewhat smaller than the *Essex*-class, but carried a total of 179 fighters and 80 torpedo bombers. Their complements included American-built *Avengers*, *Hellcats* and *Corsairs*, with some British *Firefly* "heavy fighters" and *Seafires*, naval versions of the redoubtable *Spitfire*. Designated Task Force 57, the British carrier force, under Vice Admiral Sir H. Bernard Rawlings, took on the task of protecting the southern flank by neutralizing Japanese opposition from Formosa and Sakishima Gunto. TF 57 began to hit the islands on 26 March; on the 31st, during their first kamikaze attack, a suicider hit HMS *Indefatigable's* flight deck. Unlike the American carriers, the British ships carried their horizontal ballistic protection on their flight decks, and *Indefatigable* was able to continue to do business much as usual. Throughout the Okinawa operation, TF 57 shielded the amphibious force from air strikes from Formosa and Sakishima Gunto.

Through the days before the landing, carrier planes bombed and rocketed Japanese positions on Okinawa as bombardment ships followed their schedules of fire. Japanese planes were nearly always in the area, and the carriers had to maintain constant alertness. The Japanese had learned that radar would detect neither single aircraft coming in low nor single planes or small numbers at maximum altitude, and the fleet had to rely on information from lookouts to spot such raids and to vector fighters to them.

The Japanese had formed an exaggerated notion of the damage done to TF 58 off Japan during March, and thought that the preinvasion strike was a parting shot to cover their withdrawal. As the bombardment continued, though, they realized it was nothing of the sort and ordered Operation Ten-Go, a concentrated air attack on the landing forces. Thrown somewhat off schedule by the carrier strikes, Ten-Go did not begin until 6 April, five days after the landing. Once it got underway, it did its best to make up for the lost time.

Lieutenant General Simon B. Buckner's Tenth Army (three Marine and four Army divisions) went ashore on 1 April 1945, L-day—ironically, "Love Day" in the phonetic alphabet of that time. Heavy gunfire and strikes by more than 500 carrier planes cleared the way for the assault waves. Opposition near the beaches was only sporadic, and by 18 April central and northern Okinawa were secure.

Southern Okinawa was something else again. Instead of trying to fight on the landing beaches, Lieutenant General Mitsuru Ushijima and his 100,000 troops, about one-quarter of them sailors and Okinawan conscripts, had spent months turning the rugged southern end of the island into a heavily fortified bastion with its headquarters, and principal strength, around Shuri, Okinawa's ancient capital. Ushijima's object, in keeping with the defensive doctrine recently formed by the Japanese high command, was to let the invaders establish themselves ashore with token opposition and then to defend the island's hard core as long as possible, inflicting maximum casualties on land while Japanese air power wore away at the American naval forces.

At the southern end of the island, Army divisions fought through the Japanese outer defenses and came up against Ushijima's main bastion. The real battle for Okinawa now began, as soldiers and marines, powerfully supported by artillery, aircraft and naval guns, fought their way to the southern tip of the island. Okinawa was not secured until 21 June, three weeks after the planners' predicted estimates.

While this battle wore on ashore, another struggle was taking place at sea. The first days of the Okinawa operation were deadly enough; by 5 April suiciders and conventional air attacks damaged 39 American ships, including the cruiser *Indianapolis*, Admiral Raymond Spruance's Fifth Fleet flagship. On 6 April the real ordeal began as nearly 700 Japanese planes, half of them kamikazes, attacked TF 58 and the ships of the invasion force. Radar-picket destroyers got particular attention, and two were sunk. Fighters and heavy antiaircraft fire protected the landing area, but 26 ships were

Tactical aircraft, like this F4U-1D Corsair, served as flying artillery, while Marines fought their way foot by foot. 954360

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damaged or sunk, including 2 loaded ammunition ships. Task Force 58's CAP shielded the fast carriers from harm that day.

At the same time the "superbattleship" *Yamato*, with one light cruiser and eight destroyers, sortied from the Inland Sea on what has been called a "battleship banzai." Carrying a one-way bunker load of oil, the ships were to arrive off Okinawa on the morning of 8 April and beach themselves there, acting as large pillboxes and firing at the American forces until they were destroyed or ran out of ammunition. Submarines spotted the force and, early on 7 April, search planes from the fast carriers located it. A series of strikes sank the cruiser and four of the destroyers. *Yamato*, crippled by repeated bomb and torpedo hits, finally rolled over and sank. A carrier pilot, his plane damaged, had to bail out near the sinking battleship. A search-and-rescue *Mariner* attracted Japanese fire while a second flying boat landed and picked up the aviator.

As the fight for Okinawa raged, the fleet continued to fight suiciders. Marine fighters began to operate from a captured airstrip on Okinawa, but a second field remained out of service thanks to heavy rain and Japanese shell fire. The small nearby island of Ie Shima was captured by 21 April, and Army fighters arrived there on 13 May. Much of the marines' early effort had to be focused on suicide attackers rather than on their intended ground support. TF 58 had to remain in the area to make up the difference.

This 1945 Combat Information Center aboard Cabot (CVL 28) may look primitive to modern readers, but the recently developed ability to receive, collate and analyze information from many sources in a central plot made it a significant weapon in the air-sea war.

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Jeter Isely and Philip Crowl in *The U.S. Marines and Amphibious War; Its Theory and Its Practice in the Pacific* (1951) note: "The most distinguishing feature of aerial support of ground troops on Okinawa was its tremendous size. . . . Here, too, Marine pilots got the chance to exercise one specialty for which they had been especially trained—the close support of ground troops. . . . This is not to say that the job of close support was a Marine Corps monopoly . . . nor was there any sharp division of labor between aircraft of the three services, nor should there have been. Whatever plane or group of planes was the most available was assigned to the mission at hand. . . . In general, ground troops of both services prefered land-based planes to those from the carriers, but they made no fine distinctions between army and marine aircraft. . . . Here was merely another case of practical working unity between the services."

Task Force 58 remained on station to the east of Okinawa for 10 weeks after L-day, staying on the move as its air groups flew ground support missions and fought off attackers. Between 6 April and 22 June, 1,465 Japanese planes hurled 10 mass attacks (poetically called *kikusui*, or "floating chrysanthemum" attacks) at the fleet. In between these large-scale onslaughts, more than 400 others came in individually or in small groups. Beyond these, some hundreds of conventional bomb or torpedo attacks had to be fought off.

The Japanese made the radar picket destroyers, with the landing ships assigned to support them, priority targets. Samuel Eliot Morison has remarked that "few . . . weapons have ever spread such flaming terror, such scorching burns, such searing death, as did the kamikaze in his self-destroying onslaughts on the radar picket ships. And naval history has few parallels to the sustained courage, resourcefulness and fighting spirit that the crews of those vessels displayed day after day after day in the battle for Okinawa." The radar pickets were essential to the "layered defense" held up against the suicider: first fighters, then 5-inch, 38-caliber guns opening fire with proximity fuzes at about 10,000 yards, with 40mm automatic guns chiming in at 4,000 yards and 20mm guns opening up at 1,800 yards. Carefully coordinated fighter cover was the principal anti-kamikaze weapon, but concentrated gunfire was still essential. The proximity fuze, introduced to the fleet in 1942 as a valuable antiaircraft weapon, attained new importance in the fight against the suicide plane.

The fast carriers did not lack attention. Kamikazes damaged *Hancock*, then *Enterprise*, then *Intrepid*. TF 58, in turn, headed north from time to time to attack bases on Kyushu, though the bases were too numerous and too well defended to be put out of action entirely. However, these strikes were able to destroy many aircraft that would otherwise have been able to join the *kikusui* forces, and disrupted the attackers' timetable.

April wore into May. South of Okinawa, a kamikaze hit the British carrier *Formidable* and two struck HMS *Indomitable*. Thanks to their armored flight decks, the ships sustained fairly little damage, but their electronic arrays suffered. A few days later *Formidable* took a second hit, and another plane crashed into HMS *Victorious*. This would simply not do, and the British carrier force now began to use its own radar picket destroyers. *Bunker Hill* took a hit on 11 May that killed several hundred men; during a strike on Kyushu, *Enterprise* received another suicider, and both ships had to turn eastward for repairs.

The strain of constant combat was beginning to tell. Individual task groups could retire for upkeep, but the higher commanders and their staffs had to remain on the job. Airmen and ships' crews were starting to run down; Mitscher, undermined by exhaustion, was seriously ill. Admiral Chester Nimitz shifted fleet and task force command at sea on 27 May. Admiral William Halsey relieved Spruance as the Fifth Fleet became the Third Fleet; the next day Mitscher was relieved by Vice

Admiral John McCain of command of what was now Task Force 38. As this was going on, the Japanese pulled out of their strong point at Shuri, and a declining number of suiciders concentrated on the amphibious force and the island airfields that were supporting the land offensive. The worst was over for the fast carrier force, though on 6 June a typhoon crumpled the overhanging forward end of the flight decks of the carriers *Hornet* (CV 12) and *Bennington* and amputated the bow of the cruiser *Pittsburgh* (CA 72).

On 7 June the British carrier force arrived at Sydney, Australia, its work off Sakishima Gunto completed. Task Force 38 wound up its operations with support strikes on Okinawa, with the two storm-damaged carriers backing down to launch planes over their sterns; an attack on Kyushu; and raids on Okino Daito Shima and Minami Daito Shima, small islands to the east of Okinawa. On 13 June 1945 TF 38 dropped anchor at Leyte, doubtless with a feeling of duty more than well done. The escort carriers remained on station, supporting the final days of combat. By 21 June Major General Roy Geiger, USMC, could announce that Okinawa was secure, though isolated pockets of resistance were still being found after V-J Day.

The experience of Okinawa brought an ample share of new lessons for the air Navy. Some carriers operated mixed fighter complements of *Hellcats* and *Corsairs*, requiring duplication of maintenance crews and parts inventories. Combat operations showed that differences in the fighters' performance characteristics made it impracticable to operate both types of planes together. The carriers asked that all fighter squadrons assigned to a given ship be armed with one or the other aircraft, but not with both.

Adm. Mitscher recommended changing the makeup of air groups in the light of experience fighting kamikazes. Since late-model *Hellcats* and *Corsairs* could now carry bombs and rockets they could, he thought, handle the job hitherto done by two-seater dive-bombers. This would increase carrier fighter strength, imperative if suiciders were to be defeated, without degrading the carriers' strike capability.

10 Jul–15 Aug: Carrier Operations Against Japan. Task Force 38 (VAdm. J. S. McCain), initially composed of 14 carriers and augmented by another later in the period, operated against the Japanese homeland in a series of air strikes on airfields, war and merchant shipping, naval bases and military installations from Kyushu in the south to Hokkaido in the north. In this final carrier action of WW II, carrier aircraft destroyed 1,223 enemy aircraft of which over 1,000 were on the ground, and sank 23 war and 48 merchant ships totaling 285,000 tons.

20 Jul: Fleet Airborne Electronics Training Units were established in the Atlantic and Pacific fleets to train airborne early warning crews in the theory, operation and maintenance of their equipment.

Mitscher advised arming large carriers with a ratio of three fighters to one attack plane, replacing SB2C *Helldivers* with fighter-bombers, and giving the small carriers an all-fighter air group, preferably equipped with *Corsairs* for high-altitude interception of enemy planes. As soon as the developing Grumman F8F *Bearcat*, designed as a high-performance interceptor, became available, these should replace the *Corsairs* in the small carriers. Mitscher went on to recommend that "every effort be bent towards the development" of a new fighter-bomber and a heavy-load bomber/torpedo plane, a project that was already well on its way to fruition. Two weeks before L-day at Okinawa, a new plane called the XBT2D-1 made its first flight. Though too late for WW II, Navy flyers in Korea and Vietnam would know it as the AD/A-1 *Skyraider*.

Okinawa had been a continuing education for the fleet. Increasing stress on maximum fighter cover; preemptive strikes on enemy air bases; coordination of radar warning from picket ships and, later, planes; coordinated fighter direction, making maximum use of the war-invented combat information center and the superior command and communication facilities of new amphibious command ships, whose very existence was still classified; and the heaviest possible antiaircraft gunnery, enhanced by radar and proximity fuzes, all contributed to the eventual defeat of the first large-scale cruise missile offensive against a naval force.

Operations research played its part. Studies of combat off Okinawa showed that destroyers did best when they went to top speed and turned to put attackers on the beam, unmasking as many antiaircraft guns as possible and giving a diving kamikaze a deflection target, the hardest to hit. When smaller ships took radical evasive action, this threw their gunnery off. Big ships' shooting, on the other hand, was less affected; a carrier or cruiser could try to outmaneuver an incoming suicider without deranging her gunnery.

As always, though, tools and techniques were only as good as the human beings who used them. Nearly 13,000 Americans—including 4,900 sailors and 3,400 marines—and 85 British sailors gave their lives to capture Okinawa. Twenty-six destroyers and smaller warships were lost to kamikazes; 368 more were damaged.

Okinawa's most significant heritage is a human one. Chief of Naval Operations Admiral Mike Boorda recently wrote: "The story of the battle of Okinawa, which Winston Churchill called 'among the most intense and famous of military history,' is one of courage and honor, of flexibility, determination and ingenuity during one of the 'times that try men's souls.' As we salute those who fought and endured and won through to victory, we should remember that the heritage of Okinawa is as relevant to us in 1995 as it was to the men of 1945."

A final footnote: anticipating a planned invasion of the Japanese home islands, the Navy created Task Force 69, a special antikamikaze experimental unit at Casco Bay, Maine. Though the war's end and the death of TF 69's designated commander, Vice Admiral Willis Lee, put an end to this effort, it would turn out to be the ancestor of the modern Operational Test and Evaluation Force. In more ways than one, the legacy of Okinawa still lives. ■

Awards

People of the Year:

CINCLANTFLT: AK1(AW) Maureen E. Sims—**Shore Sailor**.

COMATKWINGLANT: AO1(AW) Gerald Thomas—**Sailor**.

COMFITWINGLANT: AD1(AW) Henry Potter—**Sea Sailor** and AO1(AW) David Jarosz—**Shore Sailor**.

COMNAVAIRLANT: LCdr. Mark Kohart—**Pilot**, LCdr. Keith Menz—**NFO**, Lt. Devon Jones—**LSO**, AE1(AW/SW) Dwayne A. Strickland—**Sea Sailor** and AK1(AW) Valorie C. Mutter—**Shore Sailor**.

COMNAVAIRPAC: LCdr. John Alexander—**NFO**, AC1 Brett Butler—**Air Traffic Controller** and ET3 James Price—**Air Traffic Controller Technician**.

COMPATWINGSPAC/NAS Barbers Point: AT1(AW) Douglas R. Burger—**Shore Sailor**.

COMRESPATWINGSPAC: AT1(AW/NAC) Scott Parker—**Sailor**.

COMSTRKFIGHTWINGLANT/VFA-105: AMSC(AW) John A. Bandor—**Chief Petty Officer**.

COMNAVSURFLANT: AMS1(AW) Kevin Getz—**Shore Sailor**.

CPW-11: AW1(AW/SW) Kevin Stika—**Shore Sailor** and AW1(AW/NAC) Derek Carrow—**Sea Sailor**.

CVW-11: AT1 Robert G. Pinski—**Sailor** and Lt. Jeffrey Trent—**LSO**.

Enterprise (CVN 65): DC3 Joshua Briseno—**Junior Sailor**.

Essex (LHD 2): PN1 Gil V. Nicdao—**Sailor**.

FACSFAC VACAPES: AC1 David Leaser—**Sailor**.

FASOTRAGRUPACDET Barbers Point: AW1(AW/SW) David Bond—**Sailor** and AO1(AW/SW) Matthew Scott—**Instructor**.

George Washington (CVN 73): OS1(SW/AW) Jeffrey Broeders—**Sailor**.

HC-8: AD3(AW/SAR) Lewis E. Smith—**Aircrewman**.

HSL-47: AT1(AW) Joseph Campbell—**Shore Sailor** and AW1(AW/SW) James Leiby—**Sea Sailor**.

HSWINGLANT: AW1(AW/NAC) Sean P. Rocheleau—**Shore Sailor**.

MCAS Beaufort: Walter Melton—**Marine Corps Recycling Manager**.

NADEP Jacksonville: AMH1(AW) Thomas D. Sanxter—**Sailor**.

NAMTRAGRUDET Oceana: AT1 David Clark—**Sailor**.

NAMTRAGRUDET Miramar: AE1 Andre N. Singleton—**Sailor** and AE1(AW) Thomas F. Dolbin—**Instructor**.

NAMTRAGRUDET MTU-1012, Whidbey Island: AE1(AW) Raymond D. Standage—**Sailor** and AD1(AW/NAC) Richard S. Roediger—**Instructor**.

NAMTRAGRUHQ: AZ1(AW) William R. Pepper—**Sailor**.

NAS Barbers Point: AT1 Ronald Calverley—**Sea Sailor**.

NAS Brunswick: EO1 Tom Stine—**Sailor** and JoAnn A. Thomsen and Cheryl L. Parker—**Civilians**.

NASC: Lt. Robert Hughey—**Officer Instructor**, PR1 Michael Pecor—**Enlisted Instructor** and PR1 William Lomba—**Command Volunteer**.

NAS Cecil Field: Beverly Taylor-Mack—**Civilian**.

NAS Norfolk: ABH3 Ricki Furlong—**Junior Sailor**.

NAS Oceana AIMD: AMH1(AW) Gary Garcia—**Sea Sailor** and PR1(AW) Paul E. Zimmerman—**Shore Sailor**.

NAS Patuxent River: Lt. Cindy Alderson—**Maintenance Officer**.

NAS Whidbey Island: AMS1(AW) Gerardo Sanmillan—**Sea Sailor**, AO1(AW) Terry L. Harrison—**Shore Sailor**, AT1 Michael Mitsuda—**Reserve Sailor** and Paul F. Brewer—**Navy Recycling Manager**.

NATTC Millington: AC1(AW) Michael C. Gregory—**Senior Sailor**, ET3 Derek G. Reid—**Junior Sailor** and ABE1 Harlan M. Greene—**Mid-South Sailor**.

NAVAIRSYSCOM: AC1(AW/SW) Joel A. Doane—**Sailor**.

NAVAIRES Point Mugu: NC1(AW) Merreld Clegg—**Sailor**.

NAVRESFOR: AE1(AW) Franklin Hunt—**Sailor**.

NAWS Point Mugu: AC1(AW) John C. Rice—**Sailor**.

NRL Flight Support Det: AT1(AW) Russell A. Hilditch—**Sailor**.

Theodore Roosevelt (CVN 71): ABH1(AW) Joseph D. Howard—**Sailor**.

VAQ-135: AMH1(AW) Esteban Rico—**Sailor**.

VAQ-140: PNSN Terry F. Mayle—**Plane Captain**.

VAW-115/CVW-5/CARGRU 5: AT1(AW) Levi Cobbs—**Sailor**.

VFA-37: AD1 Jeffery Brewer—**Sailor**, Lt. Phil Hans—**Maintenance Officer** and Lt. Ryan DeLong—**Pilot**.

VFA-105: Lt. Harry Schmidt—**Pilot**, Ltjg. Frederick W. Mosenfelder—**Ground Officer** and AD1(AW) Jeffrey C. Peeples—**Sailor**.

VFA-151: AE1(AW) Robert R. Maddox—**Sailor**.

VP-4: AD1 Edward Lecco—**Sailor**.

VS-30: AT2 Craig Entzi—**Sailor**, ADAN Mathew Bibb—**"Pro"** and AN Phillip Thorton—**Plane Captain**.

VT-21: AO2 Billy Filer—**Sailor**.

COMNAVAIRPAC Air Traffic Contoller of the Year AC1 Brett Butler talks to a CVW-5 aircraft while assigned to Independence (CVN 62).

Sgt. Darrin Germany, an air traffic control watch supervisor at MCAS New River, N.C., is the **Navy and Marine Corps Air Traffic Controller of the Year for 1994**. Germany has also been selected for the Marine Corps Enlisted Commisioning Education Program.

The Jacksonville Region Naval Helicopter Association (NHA) named its top performers for 1994: LCdr. Christopher Schreiber, HSL-40—**Pilot**; LCdr. Barry Dykes, HS-1—**Instructor**; AW1 David Westheimer, HSL-44—**Aircrewman**; Ltjg. Dean Ostera, HS-7—**Maintenance Officer**; ADCS Michael Sgaglione, HSL-48—**Maintenance Technician**; Cdr. John Bader, Lt. William Butler, AWC John Hatfield and AW2 Robert Kinkton, HS-7—**Embarked Aircrew**; and Lt. D. R. Peltonen, Ltjg. D. B. Scott, AT3 T. M. Cox and ASM3 C. C. Carlson, CGAS

Savannah, Ga.—**Land-based Aircrew**. Each of the regional winners is now in competition for national NHA recognition.

The Jacksonville area chapter of the Association of Naval Aviation (ANA) recognized the top Navy pilots and Naval Flight Officers (NFOs) of 1994 at an awards ceremony aboard NAS Jacksonville, Fla. **Pilots of the Year**: Lt. Kevin Quinn, HS-15/COMHSWINGLANT; Lt. George Lipscomb, VS-32/COMSEACONWINGLANT; Lt. Bradley Cody, VP-45/COMPATWING 11; Lt. David Postoll, VFA-83/COMSTRIKFIGHTWINGLANT; LCdr. Christopher Schreiber, HSL-40/COMHSLWINGLANT; and LCdr. Anthony Clementi, HS-75/NAVAIRES. **NFOs of the Year**: Lt. Mark Pava, VP-62/NAVAIRES; Lt. Sean Dooley, VS-32/COMSEACONWINGLANT; and Lt. William Zachman, VP-16/COMPATWING 11. More than 1,000 area aviators were eligible for the awards.

HSL-51's Maintenance Control Officer, CWO3 Gary E. Cooper, earned the **1994 Captain Charles J. Nechvatal Award for CNO Aviation Ground Maintenance Officer of the Year**.

The VS-29 *Dragonfires*, NAS North Island, Calif., earned **Lockheed Corporation's 1994 Golden Wrench Award** signifying that VS-29 is tops in S-3B *Viking* maintenance on the West Coast. Additionally, VS-29's efforts last year also earned the *Dragonfires* the **1994 Commander, Sea Control Wing Top Torpedo Award**. VS-29 posted a remarkable antisubmarine warfare success rate while conducting operations from three arenas: British Columbia, Canada; NAS North Island, Calif.; and *Abraham Lincoln* (CVN 72).

Naval Air Reserve (NAR) Norfolk, Va., won the **1994 Ens. C. H. Hammann Award**, which recognizes the most efficient NAR in the country.

Lt. Michael D. Ferrari, HC-4, earned the **Association of Naval Aviation's 1994 Helicopter Combat Support Leadership Award**.

HSL-48 received the inaugural **COMNAVBASE Jacksonville Silver Anchor Award** for personnel retention excellence. The *Vipers* also earned their second straight **Helicopter Antisubmarine Light Wing, U.S. Atlantic Fleet Maintenance Excellence Award**.

The following units won **1994 Golden Anchor Awards** for excellence in career motivation and retention programs: VT-7, NAS Meridian, Miss.—CNATRA; NAS Sigonella, Italy's Tactical Support Center and HC-4—CINCUSNAVEUR; VP-69—COMPATWINGSPAC; VS-33—CINCPACFLT; and VX-1—COMOPTEVFOR.

George Washington (CVN 73) proved that it has the best crash and salvage team in the Navy by winning the **Allen G. Ogden Award** in the afloat crash and salvage category. The award is presented annually by the U.S. Navy and Marine Corps Fire Protection Association in recognition of improvement and advancement of fire prevention and protection.

NAS Lemoore, Calif., received both the **1994 CNO and the Commander in Chief Installation Excellence Awards**.

Adm. Mike Boorda, Chief of Naval Operations, presented the **Air Medal** to AT2(AW) John M. Brannen, VQ-6, for his work during Operation Deny Flight over Bosnia-Herzegovina during *George Washington's* (CVN 73) maiden deployment.

HSL-37 earned **Sikorsky Aircraft's 1994 Most Improved Maintenance Department Award**.

HSL-51 received the **1994 U.S. Navy Personal Excellence Partnership and Community Service Award**.

AE2(AW) Martin Taranski earned the **Navy Achievement Medal** for initiating and assisting with an investigation into the illegal dumping of hazardous waste near NAS Cecil Field, Fla. Taranski's efforts led to the arrest of an individual who admitted to illegally disposing of approximately 1,200 gallons of pesticide. Taranski also received the Environmental Protection Board's **Lee and Mimi Adams Award** for his actions.

The late Robert Osborn promoted aviation safety through his artwork and satire. His efforts are immortalized by the **Grampaw Pettibone Award**. The 1994 individual winner is HC-11's AMH1 Raymond Espanol, who wrote several safety articles while serving as VAW-114 Safety Petty Officer. The unit award went to VA-196; several members of the squadron contributed by writing over 30 articles covering all aspects of Naval Aviation.

VFA-204 received the **Meritorious Unit Commendation** for winning the "Triple Crown" of reserve aviation awards: the CNO Aviation Safety Award, the F. Trubee Davison Award as the best tailhook squadron in the Naval Air Reserve, and the Noel Davis Trophy Battle "E."

ABHC(AW) Larry Dean, *Enterprise* (CVN 65) Air Department, won the **Adm. Claude V. Ricketts Award** for inspirational leadership.

Lts. Allen Maxwell and George Michaels, VF-101, each earned **Air Medals**. Maxwell received the award for aviation skills he displayed while assigned to VF-103 aboard *Saratoga* (CV 60) during Operations Deny Flight and Provide Promise. Michaels' award stemmed from his involvement in support of Operation Southern Watch while assigned to VF-11 aboard *Carl Vinson* (CVN 70).

VFA-37's Lt. Don Berry received the **Christenson Award for Leadership**.

NAS Patuxent River, Md., received the **1994 Secretary of Defense Natural Resources Conservation Award**.

VR-61 earned three awards: **Western Region, Commander, Fleet Logistics Support Wing (CFLSW) Retention Excellence; CFLSW Training Excellence; and James A. Holcombe Maintenance Excellence**.

VP-46 received the **Capt. Arnold J. Isbell Trophy** as the most proficient aviation antisubmarine warfare unit in the Pacific Fleet.

VFC-13 earned the Carrier Air Wing Reserve (CVWR) 20 **Golden Wrench Award** for maintenance excellence and the CVWR-20 **Battle "E"**.

The **Adm. Flatley Memorial Award** is presented annually to the CV/CVN and LHD/LHA/LPH ships which display superior readiness in aviation safety. The 1994 CV/CVN winner is *Carl Vinson* (CVN 70), and the LHD/LHA/LPH winner is *Guam* (LPH 9).

A heavily armed VFA-204 F/A-18 Hornet searches for its target high above the Nevada desert.

Records

Several units marked **safe flying time**:

Unit	Hours	Years
HMH-462	25,000	7
HS-1	80,000	12
VAQ-138	25,000	13
VAW-113	55,000	28
VAW-116	40,000	19
VMFA-314	50,000	9
VP-10	140,000	22
VP-40	188,000	28
VS-41	128,000	15

Anniversaries

Naval Aviation	84 Years
Marine Aviation	83 Years
MAG-12	53 Years
NAS Barbers Point	53 Years
MCAS El Toro	52 Years
Third Fleet	52 Years
VFA-192	50 Years
VS-21	50 Years
VS-33	35 Years
Nashville (LPD 13)	25 Years

Special Records

Cdr. Jerome J. Mathews, CO, VAQ-136, recorded his 800th career arrested landing, aboard *Independence* (CV 62).

The following members of **VS-29** achieved these S-3B *Viking* milestones:

Cdr. Chuck Smith	4,000 hours
	500 traps
LCdr. James Higgins	500 traps
Lt. Larry Anderson	500 traps
Lt. Paul Thomas	1,000 hours
AWC Michael Kneip	400 traps
LCdr. Justin Cooper	300 traps
Lt. Donald Blair	200 traps
Lt. Joseph Keith	200 traps
Lt. Allen Johnson	200 traps
Lt. John Tekverk	200 traps
Lt. Alan Bell	100 traps

Constellation (CV 64) celebrated her 310,000th aircraft recovery, during operations in the Arabian Gulf.

Lt. James Allen, VAQ-132, achieved 1,000 EA-6B *Prowler* flight hours.

Cdr. Tony Kiggins, CO, VFA-137, completed his 1,000th carrier arrested landing.

VRC-30 CO **Cdr. J. D. Fowler**, a former P-3 pilot, achieved 5,000 flight hours and completed his 100th trap.

HSL-48's **Lts. Paul O'Rourke and Joseph Oliver** both surpassed 1,000 flight hours.

VA-95's **Lt. David Bates** logged his 1,000th A-6E *Intruder* flight hour and **Cdr. Marion Watson** acheived his 2,000th *Intruder* flight hour.

Rescues

Five members of **VS-21**, forward deployed to NAF Atsugi, Japan, worked in concert 26 February to save the life of a Japanese woman who was apparently suffering from an epileptic seizure. AK3 Jeffrey Koss coordinated the efforts of AW2s Kelly Yarnall and Robert Walker, AW3 Ryan Simpson and AEAN William Noaker as they notified paramedics, cleared the woman's blocked airway, fed information to the ambulance and generally assisted the victim until emergency medical personnel arrived. The woman was transported to an area hospital, treated and released.

An **NAS Lemoore Search and Rescue** (SAR) team evacuated 16 adults, 20 children and 4 dogs from the town of Arroyo Seco, Calif., after torrential rains and flooding of the Salinas River washed away the town's main access roads. It took six 10-minute trips to transport the people and pets to safety. Another NAS Lemoore SAR team rescued a motorcyclist stranded by the flooding. He had abandoned his bike and hiked five miles to nearby New Idria from which the SAR team airlifted him to a hospital in Salinas.

A flight crew from **Search and Rescue Helicopter Division, NAS Patuxent River, Md.**, successfully medevaced a stroke victim from a Norwegian ship on Chesapeake Bay 10 April. The crew of the UH-3H helicopter hoisted the patient from the ship and transported him to a nearby hospital. The crew consisted of LCdrs. J. D. Withers and Bob Vendrasco, AO2 Greg Spickel, AE3 Darren Beckett and HM3s Enrique Ruiz and Darrell Timpa.

An **MCAS Yuma Search and Rescue** (SAR) team answered a call from the Frye Fire Department, in nearby Sierra Vista, Ariz., regarding a rock climber who apparently fell off a cliff. The 32-year-old victim, Fernando Torres, plummeted 150 feet while climbing near a waterfall southeast of Tucson. The SAR team located Torres on a ledge on the face of a 620-foot escarpment. HMC Bob Nierenhausen rappelled from the helicopter, which was being tossed about by 10 to 15 mph gusting winds, to reach Torres. Nierenhausen found the victim unconscious, suffering from hypothermia and badly cut and bruised. Torres was prepped for transport and was hoisted, along with the corpsman, to the helicopter in a rescue litter. The victim was then flown to a hospital in Tucson.

An SH-60B *Seahawk* crew from **HSL-43**, NAS North Island, Calif., rescued two VF-213 crew members after they ejected from their F-14A *Tomcat* 27 April. LCdr. Stacy Bates and Lt. Matthew Crawford III were conducting a routine training flight while deployed aboard *Abraham Lincoln* (CVN 72) when they were forced to abandon the *Tomcat* before it crashed into the Pacific Ocean. The SH-60B was operating from *Princeton* (CG 59) and was manned by LCdr. Clint Lewis, Lt. Paul Farnan and AW2(NAC) Mark Callagan.

Scan Pattern

After providing support to atmospheric scientists for more than 16 years, the **NASA *Electra*** was retired. The four-engine turboprop aircraft, based at the Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Va., was used in numerous scientific capacities, including the study of the plume of a

volcanic eruption in Mexico; the measurement of carbon monoxide, ozone and other gases in the earth's troposphere; and the emissions of methane from tundra, forests and marshes in Canada. The *Electra* also helped test scientific equipment for use in the space shuttle program.

The **V-22** *Osprey* tilt-rotor aircraft exceeded 1,000 flight hours in risk-reduction flight testing 13 April during ongoing testing at NAS Patuxent River, Md.

The first four **U.S. Air Force students** to complete the **Naval Flight Officer (NFO) program** received their wings 26 May at the National Museum of Naval Aviation, Pensacola, Fla. 1st Lts. Dave Allen, Chris Anthony, Jeff Klein and Mike Quinini graduated from advanced jet training at VT-86 and will report to Seymour Johnson AFB, Goldsboro, N.C., for F-15E training. As part of the move toward joint training, the four were the first navigators of many to be trained by the Navy after their primary training at Randolph AFB, University City, Texas. It is expected that by FY 1997, all Air Force navigators (400–500 per year) will be trained at Pensacola. The Navy training syllabus will expand to include the entire primary NFO/Navigator training requirement of the U.S. Navy, Marine Corps, Air Force and foreign military.

The Marine Corps will shut down **MCAS Tustin, Calif.**, ahead of base realignment and closure schedule and temporarily relocate its assets. Plans call for closing the base in the summer of 1997 (two years early) and moving MAG-16 and its 10 squadrons with 2,700 marines and 118 helicopters to MCAS El Toro, Calif., until construction of facilities are complete at NAS Miramar, Calif.

VFC-13, NAS Miramar, Calif., will move to NAS Fallon, Nev., next year. The squadron is a reserve force adversary squadron whose mission is to provide airborne adversary combat training to fleet and reserve squadrons and air wings. The move will begin after 1 October 1995 and be effective 1 April 1996.

AVCM(AW) Michael Krbec, Command Master Chief of VR-58, Naval Air Reserve, Jacksonville, Fla., was selected as the new Reserve Force Master Chief by RAdm. Thomas F. Hall, Commander, Naval Reserve Force.

Sgt. Maj. Lewis G. Lee, Marine Forces, Pacific, became the 13th Sergeant Major of the Marine Corps during an official Post and Relief ceremony 19 June.

A VFA-83 F/A-18C Hornet launches from NAWS Point Mugu, Calif., ready to launch an ATM-84E SLAM missile during "SLAM-O-Mania."

Four strike fighter squadrons (VFAs) from NAS Cecil Field, Fla., participated in the first multiple launch of four **ATM-84E Standoff Land Attack Missiles** (SLAMs). F/A-18C *Hornets* from VFAs

Blue Angels Remaining 1995 Performance Schedule

JULY

1-2	Redding, Calif.
8-9	Bushell Park, Canada
15-16	Hillsboro, Ore.
22	Pensacola Beach, Fla.
29-30	Kansas City, Mo.

AUGUST

5-6	Columbus, Ohio
12-13	Dubuque, Iowa
19-20	Reading, Pa.
25-27	NAS Miramar, Calif.

SEPTEMBER

2-3	NAS Barbers Point, Hawaii
9-10	NAS Whidbey Island, Wash.
16-17	Smyrna, Tenn.
23-24	NAS Oceana, Va.
30	Alexandria, La.

OCTOBER

1	Alexandria, La.
7-8	San Francisco, Calif.
14	NAS Fallon, Nev.
21-22	Houston, Texas
28-29	Bergstrom ARS, Texas

NOVEMBER

4-5	NAS Cecil Field, Fla.
10-11	NAS Pensacola, Fla.

81, 82, 83 and 131, along with a VX-9 F/A-18C, fired the missiles as part of an exercise dubbed "SLAM-O-Mania." Ten squadrons from the East and West coasts took part as the *Hornets*, with in-flight refueling support from VA-196 and VS-32, successfully SLAMmed a sea van target on San Nicolas Island off the coast of California. The SLAMs scored four direct hits.

Vance Vasquez

The NP-3D Orion with "billboard" modification supports many different operations with its "over-the-horizon" scanning ability. All three of the Navy's NP-3Ds are based at NAWS Point Mugu, Calif., and an Orion like this one provided range clearance for "Slam-O-Mania."

Change of Command

George Washington (CVN 73): Capt. Malcolm P. Branch relieved Capt. Robert G. Sprigg, 20 Apr.

HC-85: Cdr. A. Mitchell, Jr., relieved Cdr. R. Schowe, Apr.

HMM-161: Lt. Col. Robert J. Briggs relieved Lt. Col. William J. Niemasik, 17 May.

HMM-166: Lt. Col. Stuart R. McMeans relieved Lt. Col. Danny J. McDaniel, 11 May.

HS-8: Cdr. Terrence M. Doyle relieved Cdr. Henry E. Dosker, Jr., 19 Apr.

HSL-47: Cdr. Jeffery R. Campbell relieved Cdr. Ian P. Fetterman, 25 May.

HSL-84: Cdr. Kevin J. Sullivan relieved Cdr. William G. Boddy, 6 May.

HT-18: Lt. Col. James A. McCormick relieved Cdr. Duane Heughan, May.

MAG-16: Col. John F. Pettine relieved Col. Ralph E. Parker, Jr., 5 May.

MAG-39: Col. Michael J. Aguilar relieved Col. Drake F. Trumpe, 25 May.

MALS-13: Lt. Col. Wesley Wieckowski relieved Lt. Col. Carl L. Hughes, Jr., 21 Apr.

NADEP North Island: Capt. Rich Macon relieved Capt. Bob Neel, 7 Apr.

NAS North Island: Capt. Donald F. Steuer relieved Capt. James Jarrell, 20 Apr.

NAVAIRSYSCOM: VAdm. John A. Lockhard relieved VAdm. William C. Bowes, 10 Mar.

NAWCAD Warminster: Capt. Michael A. Cosgrove relieved Capt. William L. McCracken, May.

NAWCAD Patuxent River: RAdm.(sel) Larry D. Newsome relieved RAdm. Barton D. Strong, 26 Apr.

NB Jacksonville: RAdm. Kevin F. Delaney relieved RAdm. Frank M. Dirren, 12 May.

PATWING 10: Capt. James A. Carman, Jr., relieved Capt. Richard L. Rodgers, 21 Apr.

SIXTHFLT: VAdm. Donald L. Pilling relieved VAdm. Joseph W. Prueher, 19 Apr.

TRAWING 6: Capt. Daniel R. McCort relieved Capt. Michael C. Vogt, 25 May.

VAQ-139: Cdr. Ronald C. Plucker relieved Cdr. Kenneth P. Parks, 19 May.

VAW-78: Cdr. Craig O. McDonald relieved Cdr. James R. Anderson, 10 Jun.

VAW-120: Cdr. Frank N. Clark relieved Capt. Vernon C. Huber, 12 Apr.

VF-21: Cdr. James Usbeck relieved Cdr. Kenneth Ginader, 10 Apr.

VF-84: Cdr. Brad Goetsch relieved Cdr. Dan Cloyd, 12 May.

VF-213: Cdr. Fred Kilian relieved Cdr. Mike Galpin, 30 Mar.

VFA-27: Cdr. James F. Ward relieved Cdr. Danny C. Knutson, 23 May.

VFA-37: Cdr. George B. Dom relieved Cdr. John S. Hoffman, 13 Apr.

VFA-127: Cdr. David E. Mosca relieved Cdr. William F. Wright, May.

VMA-211: Lt. Col. Michael W. Smyth relieved Lt. Col. Kenneth G. Williams, 19 May.

VMA-311: Lt. Col. Charles Reif relieved Lt. Col. David Buland, 19 May.

VMFA(AW)-332: Lt. Col. Roland N. Burgess relieved Lt. Col. Mark E. Condra, 28 Apr.

VP-4: Cdr. Sean O'Brien relieved Cdr. Jim Buyske, 7 Apr.

VP-8: Cdr. G. A. Fogg relieved Cdr. Timothy J. Cepak, 21 Apr.

VP-9: Cdr. Brendan L. Gray relieved Cdr. John V. Plehal, 5 May.

VP-26: Cdr. Richard L. Marcantonio relieved Cdr. R. Bradford Leininger, 31 Mar.

VP-68: Cdr. Robert A. Sinibaldi, Jr., relieved Capt.(sel) E. Byron Fisher, Jr., 14 Apr.

VQ-1: Cdr. John H. Orme relieved Cdr. John M. Brownell, 16 Jun.

VRC-30: Cdr. Ferdinand L. Salomon relieved Cdr. J. D. Fowler, 21 Apr.

VS-21: Cdr. David A. Rhodes relieved Cdr. Dwight L. Cousins, 7 Apr.

VS-31: Cdr. Bruce S. Bole relieved Cdr. Gregory H. Cooper, 28 Apr.

VS-38: Cdr. Jadd B. Wilburn relieved Cdr. John R. Warnecke, 25 May.

VTC-1: Capt. David A. Dahman relieved Capt. Kenneth L. Eichelberger, Apr.

Naval Aviation Historian and Naval Aviation Artist Honored

Zip Rausa

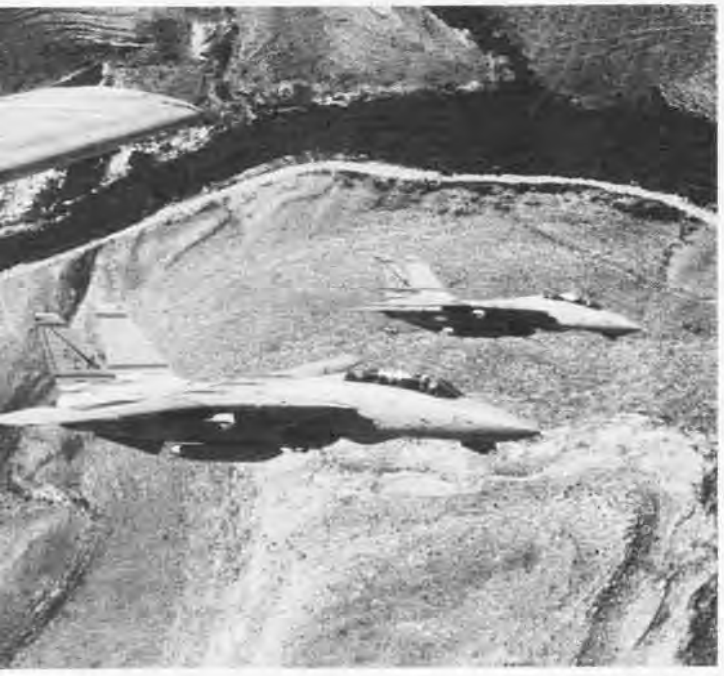
John Elliott receives the Admiral Arthur W. Radford Award from Adm. Huntington Hardisty, Chairman of the Board, Naval Aviation Museum Foundation, during Symposium '95 held at the National Museum of Naval Aviation, Pensacola, Fla.

The Naval Aviation Museum Foundation (NAMF), Pensacola, Fla., presented the **Adm. Arthur W. Radford Award for Excellence in Naval Aviation History and Literature** to noted author and historian Maj. John M. Elliott, USMC (Ret.). Maj. Elliott is considered the world's leading expert on U.S. Navy and Marine Corps aircraft paint schemes and his four-volume *The Official Monogram U.S. Navy and Marine Corps Aircraft Color Guide* is used as the definitive resource for marking and painting U.S. naval aircraft.

In conjunction with Maj. Elliott's honor, the NAMF presented celebrated Naval Aviation artist Capt. Ted Wilbur, USNR (Ret.), with the **R. G. Smith Award for Excellence in Naval Aviation Art**, sponsored by McDonnell Douglas Corporation. Capt. Wilbur's artwork has been published in *Proceedings*, *Time* and *Saturday Review*, to name only a few publications, and his illustrations are currently featured in the "Grampaw Pettibone" column of *Naval Aviation News*. He was personally instrumental in the development of the Sea-Air Hall in the Smithsonian's National Air and Space Museum, where some of his artwork is also displayed, and he is an Artist Fellow of the American Society of Aviation Artists.

Ted Wilbur received the R.G. Smith Award during the 5 May Symposium '95 for his contributions in the preservation of the proud heritage and rich history of Naval Aviation through art. Here, Ted stands before his painting of famed stunt pilot Frank Tallman.

ANA Bimonthly Photo Competition



Bimonthly Winner

Left: LCdr. Brian Gawne, VF-32, captured the excitement of dynamic maneuvering over the spectacular landscape of Israel as squadron F-14s "Gypsy" 210 and 216 participated in Exercise Juniper Falconry in February 1995. Below: Perfect timing enabled Richard Jones to catch this F-14 Tomcat of VF-101 touching down at NAS Oceana, Va., giving the pilot's family a thrilling view. Bottom: Vance Vasquez shows a day in the life of an air station as the air space over Naval Air Weapons Station Point Mugu, Calif., is momentarily filled with CH-46 Sea Knights, while an FA-18C Hornet awaits its turn.

The Association of Naval Aviation and its magazine, *Wings of Gold*, is continuing its annual photo contest which began in 1989. Everyone is eligible except the staffs of *Wings of Gold* and *Naval Aviation News*. The ONLY requirement is that the subject matter pertain to Naval Aviation. Submissions can be in black and white or color, slides or prints of any dimension. Please include the photographer's complete name and address, and **PHOTO CAPTION.**

Cash Awards: Bimonthly - $100; Annual - First, $500; Second, $350; Third, $250.

For deadline and submission details, call (703) 998-7733. Mail photographs to : Association of Naval Aviation Photo Contest, 5205 Leesburg Pike, Suite 200, Falls Church, VA 22041-3863.

By Cdr. Peter B. Mersky, USNR (Ret.)

Trimble, William F. *Admiral William A. Moffett, Architect of Naval Aviation.* Smithsonian Institution Press, 470 L'Enfant Plaza, Washington, DC 20560. 1994. 338 pp. $29.95.

Written in an easy-going, story-telling narrative, which belies the research undertaken, this book opens with a good synopsis of Moffett's career and of his importance to Naval Aviation in the 1920s. It is not widely known that he received the Medal of Honor for action at Vera Cruz in 1914 while in command of the cruiser *Chester.*

The major portion of the biography details Moffett's contribution during the busy 1920s as American military and civilian aviation grew rapidly, sometimes fighting each other for funding. Nowhere is this in-house confrontation more dramatically illustrated than the turbulent Army-Navy conflict personified by the vocal Billy Mitchell and his constant pronouncements, many aimed at the Navy. Much of the confrontation began over highly publicized aerial bombing tests against surface ships. By 1925, the reappointments of Moffett and Mitchell to their respective positions as chief and assistant chief of the Navy and Army air departments were in jeopardy. In February 1925, Moffett was reappointed; however, Mitchell was replaced, reduced to his permanent rank of colonel and assigned to a command in Texas.

William Moffett, as the Navy's primary "air" admiral, took the brunt of much of the Mitchell tirade, which is well shown in this biography. Indeed, the trends and conflicts of this period seem little changed some 70 years later.

The last chapter, describing Moffett's death in the crash of the airship *Akron,* is a chilling account of the abrupt end of this man's productive career.

Musciano, Walter A. *Warbirds of the Sea: A History of Aircraft Carriers & Carrier-Based Aircraft.* Schiffer Publishing, Ltd., 77 Lower Valley Rd., Atglen, PA 19310. 1994. 591 pp. Ill. $49.95.

This is a big book, in size and scope. The author, who has written several smaller books, is probably best known for a history of WW II *Corsair* aces. While *Warbirds of the Sea* is obviously a labor of love, and Mr. Musciano deserves an A+ for effort, the book contains many errors.

There are several fine photos of people, aircraft and ships which have all figured in the story of carrier air power. The book is generally well laid out and takes advantage of the photos, although for its price, I expected a few color photos. I have trouble with the use of arrows on many of the photographs, which detract from the view of the aircraft. There are also glitches in some photo captions. For instance, page 463 carries a well-known photo of Vietnam aces Cunningham and Driscoll in an F-4 with eight North Vietnamese flags on its starboard intake splitter vane. The author states that the two aviators are in their F-4 "after scoring their eighth victory." As any student of the Vietnam War knows, this pilot-radar intercept officer team from VF-96 ejected from their F-4 on 10 May 1972 and scored five, not eight, kills. The eight kills on the aircraft represent VF-96's overall tally. The caption on page 449 incorrectly nicknames the EA-6A *Prowler;* the two-seat aircraft actually retained the name of its bomber parent, *Intruder.* The four-seat EA-6B is officially designated *Prowler.* The A-7 on page 510 is definitely not launching on a combat mission over Vietnam. It is a test aircraft, as evidenced by the prominent "cross" marking below the cockpit.

A major gaffe appears in the text on page 502. The F-14C never went into production, thus never had the large number of 500 built, with "80 sold to Japan." Anyone interested in Naval Aviation could tell the author that the *Tomcat* has never worn the rising sun. An alert editor should have caught this error.

Editing is a problem, with occasional tense shifts—such as that on page 374 describing the long-retired E-1B in the present, while most of the surrounding text is in the past. There are many other such problems which, as with any major work that purports to be authoritative, immediately throw the book's and author's credibility open to question. Pages 500–501 discuss the E-2/F-14 relationship, but the author has gotten several points wrong, including distances for aircraft coverage. The *Super Tom* was actually the F-14D (nee F-14A+), and only 24 F-14Ds were delivered.

His drawing of an F-14A on page 501 has several errors in annotation. A few mistakes: the *Tomcat* does not use ailerons, but spoilers; leading edge "flaps" should be "slats"; and the "dark gray coating" is actually an air bag between the fuselage and wings.

Quoting engine and performance statistics is always risky, and the author might be forgiven for using out-of-date material gained from commonly accepted references. However, in such a major work, it would have shown a bit more initiative in research to ensure currency. The F-14A's Pratt & Whitney engines originally produced 20,000 pounds of thrust apiece in afterburner, but an agonizing series of detunings, in response to engine stalls, resulted in a current rating of just over 17,000 pounds. And, maximum weight is 72,000 pounds, not 74,350.

Another major annotative error is designating carriers as CVAs. This designation was deleted in 1972 with the adoption of CV. Again, the author and a knowledgeable editor should have caught this mistake.

The text is arranged in paragraphs with bold-faced titles and literally starts at the beginning of sea-based "aircraft." The obligatory progression through both world wars and Korea tells the story in a decent fashion. Later chapters discuss Third World carriers—Argentina, Brazil, India and Australia—as well as the late USSR's stillborn endeavors. There are passages where it's obvious that the information was part of a long-term file and is no longer current. Case in point: on page 404, while the XF8U-1 originally resided at the Smithsonian's Silver Hill, Md., facility, it moved to another museum in Seattle, Wash., as long ago as 1987.

There have been several books on carrier development, operational history and impact on foreign policy. Attention to

detail and proofing would have made this one much better. The task isn't easy, but for a book costing $50 the reader has a right to expect such dedication. *Warbirds of the Sea* isn't the single-source introduction to carrier air's amazing history that its author wanted. It does have some good points, but the reader should approach it with some healthy skepticism.

Ethell, Jeffrey and Alfred Price. *World War II Fighting Jets.* Naval Institute Press, 118 Maryland Ave., Annapolis, MD 21402. 1994. 211 pp. Ill. $29.95.

Well-written and researched, this look at the first generation of military jet fighters comes from two experienced, highly regarded authors. The title might be a little misleading, since three of the nine types described did not actually see combat—although they were entering limited service at war's end—and three of the nine were rocket powered. Each chapter discusses a specific aircraft, its development, service career and impact on the war.

There are nearly 200 photos, most of which are satisfactorily reproduced. Cutaways and a few maps round out the graphic content and complement the informative text.

The longest chapter describes the milestone Messerschmitt Me 262, which had the longest and most successful career of any of the wartime jets. Pilots tell their experiences with the trend-setting fighter, and there is lots of detail on the 262's fighting experiences. Contrary to popular conception, like the Me 163 rocket fighter, the 262 did not enjoy a one-sided success rate, and a surprising number were shot down by Allied fighters. For me, the book's most interesting revelation is the confirmation that the single-engine Heinkel He 162 saw limited combat in the final days of the war. I had never seen any specific dates or names in connection with this little fighter's combat engagements until now.

The authors discuss the world's first jet bomber, the Arado 234, which, along with the 262, was the most successful of the early jets. Other types include Japan's Yokosuka MXY-7 Ohka suicide rocket plane, known as the "Baka" by the American sailors and Marines on the ships that it targeted; the Lockheed P-80; the Ryan FR-1 *Fireball*, a plane that used a conventional piston engine along with a turbojet engine; and the German Bachem Ba 349 *Natter*, a vertically launched rocket interceptor going through flight tests when the war ended. Of these, the P-80 is definitely the most well known and important. Its two-seat derivative, the T-33, is still operating around the world, nearly 50 years after its design.

Gillcrist, Paul T., Rear Admiral, USN (Ret). *Tomcat! The Grumman F-14 Story.* Schiffer Publishing, Ltd., 77 Lower Valley Rd., Atglen, PA 19310. 1994. 207 pp. Ill. $39.95.

There will be people who won't like this book. They will point to sources of information and experience that the author had available but didn't use. They will lament that the book is a breast-beating, prideful account of a senior aviator's involvement with one of the Navy's most controversial and ultimately forlorn post-Vietnam aircraft. And, to an extent, these people will be right. In spite of these assessments, I found it hard not to enjoy this deeply personal memoir by a highly experienced Naval Aviator.

RAdm. Gillcrist writes with the deep convictions that he should have as a fighter pilot, regularly inserting his opinions and disgust with the system. There are times when he is obviously repeating the company line, especially regarding such highly publicized events as the 1989 shootdown of two Libyan MiG-23s, whose pilots were plainly on a training flight and not interested in engaging the two VF-32 *Tomcat* crews who eventually shot them down. (This engagement still causes painful discussions within the fighter community.)

The author's text could have also benefited from a knowledgeable editor. Typos, missing words and general inconsistency are annoying regularities for the reader. Aircraft designations—the bane of many publishers—are a case in point. The correct numbers are *not* A-4D, F-9F8B, F-4D or F-4H-1. Also, Hank Kleeman was not the first F-14 pilot to get a MiG; his kill was a Sukhoi *Fitter*. And, a common error, RAdm. Riley Mixson's name is misspelled.

Even with these points and the book's hefty price, it does offer something different than the typical nuts-and-bolts aircraft biography. Using high-quality color photography throughout, complemented with several appendices, and including revelations such as the fact that Iranian *Tomcat* pilots have used the AIM-54 Phoenix in combat against Iraqi aircraft, *Tomcat!* should be a part of most enthusiasts' libraries. Current and past F-14 crews should also read it.

Unmanned Aerial Vehicles

I would like to add some information to your Mar–Apr 95 article, "New Horizons for Unmanned Reconnaissance Aircraft," on unmanned aerial vehicle (UAV) units and their achievements throughout the *Pioneer* UAV program.

The Fleet Assistance and Support Team (FAST) was chartered by the Naval Air Systems Command in 1986 to undertake and perform all research, development, testing and evaluation programs for the *Pioneer* UAV and was in the forefront of UAV technology changes and advancements for eight years. Until its disestablishment in August 1994 at the behest of the Program Executive Office for Cruise Missiles and UAVs, the FAST designed, analyzed, developed, created and implemented hundreds of test plans and software/hardware modifications, as well as aircraft configuration changes. The FAST pursued its role with determination to ensure that the *Pioneer* UAVs used in the fleet were safe, efficient and effective in carrying out their assigned tasks. The FAST also carried on various high-profile, technologically challenging projects with various other Department of Defense and government agencies, including work on the NASA Supersonic Transport program, the Joint Theater Ballistic Missile Defense program, the Coastal Battlefield Reconnaissance and Surveillance project for mine detection, *Pioneer* UAV rocket-assisted takeoff launch equipment and procedures testing, and the first joint UAV/Tomahawk Cruise Missile operations, to name only a few significant programs. Most

of the projects mentioned in the *Naval Aviation News* article were accomplished by the FAST or with direct FAST assistance and input.

The FAST, a joint service unit composed of marines, sailors and civilian technicians, also created and staffed the only *Pioneer* UAV Intermediate-level Maintenance Activity (IMA). The FAST repaired and rebuilt 19 *Pioneer* UAVs during the four-year IMA program—saving the government more than $12 million, which otherwise would have gone to contractors to accomplish the same repairs. All of the repaired vehicles were reallocated to various field units, allowing them to maintain higher sortie availability rates and increasing the effectiveness of *Pioneer* UAV fleet support. The FAST accumulated well over 1,500 *Pioneer* flight hours with a mishap rate far better than that of their fleet counterparts despite the difficult and unusual tasks they were routinely required to perform.

This letter is a way of recognizing those marines, sailors and civilians whose tireless efforts made the FAST such a success during its existence and who provided the UAV community in general, and the *Pioneer* community specifically, with a wealth of firsthand knowledge about UAV system and operator performance.

Capt. John T. A. Rosenthal, USMC
Recruiting Station, San Francisco
620 Central Avenue, 2E
Alameda, CA 94501-3406

Women's Aviation Memorial

History was made in September 1942 at what is now the New Castle County Airport (then Army Air Base), Del., when a group of 25 women reported for duty to fly aircraft—the first women ever to do so in the U.S. military. These women aviators served their country in the early stages of our involvement in WW II by flying military airplanes on various noncombat missions, such as ferrying, target towing and flight testing, which released many men for combat training and service. They were called WAFS (Women's Auxiliary Ferrying Squadron), later becoming WASPs (Women's Airforce Service Pilots).

These courageous women flew thousands of hours in every type of plane—from fighters to four-engine bombers. In the performance of these duties, 38 gave their lives. Their contribution to winning the war was finally recognized by Congress in 1977. To permanently memorialize their efforts, a life-sized statue of a female pilot dressed in full flying gear, by Delaware sculptor Charles Parks, will be erected at the New Castle County Airport.

If you wish to help honor these women aviators, please send your tax-deductible donations to: Delaware Aviation Memorial Foundation, Inc., 5996 Kirkwood Highway, Wilmington, DE 19808 (phone 302-992-0505).

Harrier Book

Following our recent publication, *The Phantom Story*, and an earlier book on the A-6 *Intruder*, we are currently writing *The Harrier Story*. We wish to hear from any marines who are or have been involved with the AV-8A or AV-8B, either as flyers or maintainers, including experiences in the Gulf War. Any material or photos will be treated with great care and returned if requested. Write to Peter E. Davies and Tony Thornborough, 28 Claremont Road, Bishopston, Bristol, BS7 8DH, Avon, England, UK.

Reunions, Symposiums, etc.

NESEP/MESEP graduates interested in organizing socially or professionally, contact LCdr. Monty Oakes, 4440 Bennett Ln., Virginia Beach, VA 23462, 804-554-0515.

***Independence* (CVA/CV 62) reunion**, 12–16 JUL, New Orleans, LA. POC: Denis Bagley, 12 Trenton Ave., Edison, NJ 08817, 908-819-0359.

Aviation Art Forum, 17–21 JUL, Dayton, OH. POC: Luther Gore, American Society of Aviation Artists, 1805 Meadowbrook Heights Rd., Charlottesville, VA 22901.

Airliners Intl. Convention, 18–22 JUL, Scottsdale, AZ. POC: Alan Merkle, 602-993-8276.

NAS Ottumwa reunion, 19–21 JUL. POC: Larry Cofer, 136 Deppe Ln., Ottumwa, IA 52501, 515-682-0982.

***Bennington* (CV/CVA/CVS 20) reunion**, 19–23 JUL, Bennington, VT. POC: Bill Copeland, 47 Thompson St., Maynard, MA 01754, 508-897-8139.

Intl. Assn. of Airborne Veterans trip, 24 JUL–7 AUG, to Russia and Ukraine. POC: Sharkhunters/Eaglehunters, Box 1539, Hernando, FL 34442, 904-637-2917.

VPB-21 reunion, 25–27 JUL, Incline Village, NV. POC: Rollie Leeburg, 1006 Phillips Ave., Petaluma, CA 94952, 707-763-1009.

Aviation Boatswain's Mates Assn. symposium, 1–4 AUG, San Diego, CA. POC: Debbie Gale, ABMA, 1438 Switzerland Dr., San Diego, CA 92154, 619-424-9481.

Air Group 12 reunion, 2–5 AUG, Portland, OR. POC: Richard Weston, 72 Penzance Rd., Rockport, MA 01966, 508-546-9753.

***Enterprise* (CV 6) reunion**, 9–12 AUG, King of Prussia, PA. POC: Tom Rowlands, 23 Old Pond Rd., Levittown, PA 19057, 215-946-1972.

Assn. of Minemen reunion, 11–13 AUG, Reno, NV. POC: PO Box 71835, Charleston, SC 29415, or call Lyal Stryker, 803-553-1450.

***Bon Homme Richard* (CV/CVA 31) reunion**, 11–13 AUG, San Francisco, CA. POC: Ralph Pound, PO Box 1531, Tupelo, MS 38802, 601-842-0572/8247.

Escort Carrier Sailors & Airmen Assn. (CVE 1–CVE 122) reunion, 11–15 AUG, San Diego, CA. POC: Elton Powers, 818 Village Dr., Lynchburg, VA 24502, 804-239-7248.

***Wasp* (CV/CVA/CVS 18) reunion**, 13–20 AUG, Everett, WA. POC: Richard VanOver, 6584 Bunting Rd., Orchard Park, NY 14127.

VF-211 50th anniversary reunion, 18 AUG, San Diego, CA. POC: Lts. Thor Osteboe or Denis Tri, VF-211, NAS Miramar, San Diego, CA 92145, 619-537-1370/DSN 577.

***Enterprise* (CVAN/CVN 65) reunion**, 19–23 AUG, Minneapolis, MN. POC: Don Rasmussen, Rt. 4 Box 17, Long Prairie, MN 56347, 704-322-5445.

VP/VPB 18 reunion, 21–25 AUG, Philadelphia, PA. POC: Max Fernys, 238 Robbins St., Philadelphia, PA 19111, 800-982-7642.

***Salisbury Sound* (AV 13) reunion**, 24–26 AUG. POC: Marian Bruce, 813 Branding Iron SE, Albuquerque, NM 87123.

***Hoggatt Bay* (CVE 75) reunion**, 24–27 AUG, Portland, OR. POC: Ginny Canady, 5868 Argyle Way, Riverside, CA 92506, 909-787-8666.

***Salamaua* (CVE 96) reunion**, 30 AUG–2 SEP, Oklahoma City, OK. POC: John W. Smith, 7268 NW 16th St., Ankeny, IA 50021, 515-289-1467.

PBY Catalina Intl. Assn. reunion, 30 AUG–3 SEP, Pensacola, FL. POC: James Thompson, 1510 Kabel Dr., New Orleans, LA 70131, 504-392-1227.

VPB-111/VP-21 reunion, 31 AUG–2 SEP, Seattle, WA. POC: Dick Webb, 5702 Carry Back Dr., Indianapolis, IN 46237, 317-786-2167.

NAS San Diego A&R Div. reunion, SEP 95, San Diego, CA. POC: Granville Coomes, 181 NW "A" St., Richmond, IN 47374, 317-966-4741.

Naval Minewarfare Assn. reunion, SEP 95, Hilton Head Island, SC. POC: Jim Minor, 224 Angelus Dr., Salinas, CA 93906-3302, 408-449-5352.

***Intrepid* (CV/CVA/CVS 11) reunion**, 2 SEP, New York, NY. POC: Laurence Blackburn, Jr., 22 Watercrest Dr., Doylestown, PA 18901-3240, 215-345-5690.

***Belleau Wood* (CVL 24) reunion**, 6–10 SEP, Arlington, VA. POC: Robert Ross, 2732 S US 23, Oscoda, MI 48750, 517-739-2182/2591.

***Curtiss* (AV 4) reunion**, 6–10 SEP, Minneapolis, MN. POC: Francis Pavlu, 9255 N. Magnolia Ave. Sp. 293, Santee, CA 92071-3168, 619-448-3685.

***Saginaw Bay* (CVE 82) reunion**, 6–10 SEP, Cincinnati, OH. POC: Earl Homman, 4220 Old Mill Rd., Lancaster, OH 43130, 614-654-1651.

VR-24 reunion, 7–10 SEP, Minneapolis, MN. POC: Pete Owen, 24633 Mulholland Hwy., Calabasas, CA 91302, 818-222-6936.

***Bunker Hill* (CV 17/CG 52) reunion**, 7–11 SEP, San Diego, CA. POC: Al Turnbull, 429 Pacific Oaks Rd., Goleta, CA 93117-2910, 805-685-1448.

Northeast Flight '95 Airshow, 9–10 SEP, Schenectady County Airport, NY. POC: Steven Israel, 130 Saratoga Rd., Scotia, NY 12302, 518-377-2191.

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