NAVAL AVIATION NEWS

May–June 1995

USNTPS 1995

50 Years of Pushing the Envelope Page 22

NAVAL AVIATION NEWS

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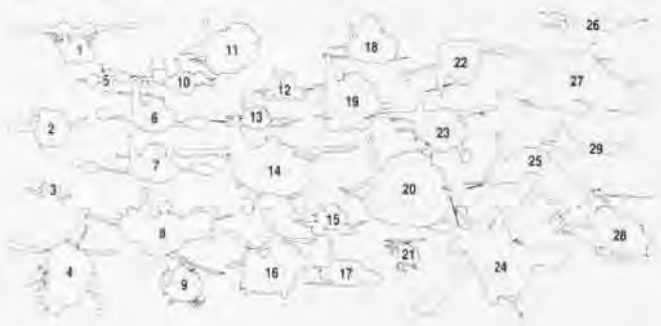

COVERS—

More than half of the major aircraft types assigned to the U.S. Naval Test Pilot School in its 50-year history are shown in this Aerocatures™ "fly-by" by Hank Caruso. Aircraft depicted are: **1** PBY-6A, **2** FM-2, **3** F4U-4, **4** SH-34G, **5** F7F-3, **6** F9F-5, **7** T-1A, **8** S-2A, **9** UH-1E, **10** OV-1A, **11** TF-8A, **12** F4D-1, **13** C-54Q, **14** U-6A, **15** AD-5N, **16** CH-46E, **17** T-39D, **18** T-28B, **19** TA-4F, **20** **TA-7C**, **21** OH-6A, **22** T-2C, **23** NU-1B, **24** UH-60, **25** T-38, **26** X-26A, **27** F/A-18B, **28** AH-1G and **29** P-3.

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

The United States Naval Test Pilot School

In this era of downsizing and reduced funding, the efficient test and evaluation of new airframes, power plants and systems has never been more important. Accurate and detailed performance appraisals documented in clear and concise reports are essential in arming program managers with the information necessary to continue development, funding or moving products into production. Equipping experienced fleet pilots, Naval Flight Officers and civil service engineers with the knowledge to conduct this test and evaluation safely and expeditiously is the mission of the U.S. Naval Test Pilot School (USNTPS), NAS Patuxent River, Md.

This year, USNTPS celebrates its golden anniversary. A course of training was envisioned by Commander (later Vice Admiral) Thomas Connolly whose concern was that pilots straight from the fleet were not adequately prepared to execute the increasingly technical flight techniques required to assess the aircraft being produced in the latter days of WW II. Commander Sidney Sherby, who had recently graduated from M.I.T. with a master's degree in Aeronautical Engineering, was called upon to create a course of test pilot training to equip incoming pilots with the necessary knowledge. The training lasted 10 weeks and graduates were presented with a graduation certificate and a slide rule by Rear Admiral A. P. Storrs, Commander, Naval Air Test Center, Patuxent River.

Over the years, aircraft continued to become more sophisticated and test pilot training evolved into the current 11-month USNTPS course of instruction. In what is a lesson for all of us, the world's finest test pilot school started with the vision of a few men, who identified a requirement and did something about it. Today, we all benefit from their dedication and commitment to excellence.

JO2 Bobby Jones

RAdm. Brent M. Bennitt

Several things distinguish USNTPS from other test pilot schools. Jointness is the hallmark of the way the school does business. Every class has among its enrollment not only Navy, Marine, Air Force and Army officers, but also civil service engineers from throughout the Naval Air Systems Command community and students from foreign nations. Perhaps most unique about the school are its three curricula: Fixed Wing Flight Mechanics, Rotary Wing Flight Mechanics and Airborne Systems. In fact, because we have the only U.S. test pilot school to offer a Rotary Wing Flight Mechanics curriculum, every U.S. Army, Air Force and Marine rotary wing engineering test pilot attends our school. The Airborne Systems curriculum focuses on the increasingly important test and evaluation of avionics and sensor systems. These carefully tailored curricula permit students to learn the specialized discipline of flight testing so that, after graduation, they can "hit the ground running" and quickly contribute to the test and evaluation efforts being conducted on fleet aircraft and systems.

As a graduate of Class 52, I can personally attest to the validity of the time management advice given to students upon arrival. Spend half the day on academics, half the day flying and half the day writing reports! In what was one of the busiest and most enjoyable 11 months in my naval career, I flew 12 different aircraft, attended the equivalent of 30 semester hours of academics and wrote several hundred pages of technical reports. The skills I learned have stayed with me and continue to serve me daily.

A listing of USNTPS graduates reads like a "Who's Who" of aeronautical, astronautical and professional achievement: Rear Admiral Alan Shepard, Class 5, the first American to be launched into space; Senator John Glenn, Class 12, the first American to orbit the earth; Captain John Young, Class 23, Commander, STS-1, the first shuttle mission; Vice Admiral James Stockdale, Class 12, recipient of the Medal of Honor; and Lieutenant Najeeb Halaby, an early USNTPS instructor pilot, who later became the adminstrator of the Federal Aviation Administration and president of Pan American World Airways. Today, graduates can be found in leadership positions both in the military and civilian sectors.

Especially during this 50th anniversary year, consider the importance of professional test and evaluation of the aircraft and systems you fly, maintain and support. Look upon how you fly, conduct maintenance and support aircrews and aircraft with the critical eye of the test pilot. If you determine a requirement exists and it appears to be underaddressed, make your concerns known throughout the chain of command. Everyone—officer, enlisted and civilian—has a contribution to make. To the over 2,500 graduates of the U.S. Naval Test Pilot School, I salute you and thank you for your contribution in making Naval Aviation the great team it is today.

FLY 'EM SAFE!

Illustrations by Ted Wilbur

PETTIBONE'S DAD

Sinking of a Sea Knight

A CH-46E *Sea Knight*, with a crew of three and six passengers on board, was one of three helos en route over water to a shore base. At 500 feet and 110 knots, No. 1 engine's torque dropped to 0–20 percent with a noticeable "winding down" sound. The copilot was at the controls at the time, but the helicopter aircraft commander (HAC) immediately took over.

The HAC quickly armed the emergency throttle system (ETS) and stated that he had reset the No. 2 ETS. The crew believed power to No. 1 was regained since torque rose 40 percent higher than the No. 2 engine's, and there was a rise in No. 1's turbine inlet temperature (T5).

The HAC transmitted, "We seem to have regained power." But he was unable to beep No. 1 down and its T5 had reached a maximum gauge reading (1,200 degrees C).

The copilot (CP) moved No. 1's engine condition lever (ECL) back to start as directed by the HAC. The HAC then directed the crew chief (CC) to place the No. 1 ECL in crank in an attempt to cool the engine.

During a right turn to the shoreline, a wingman radioed that the right engine of the *Sea Knight* was trailing smoke. No fire warning lights were observed in the CH-46.

Believing that his remaining engine was on fire, the HAC told the CP, "Reset No. 1." The CP placed No. 1 ECL in "FLY." The CC believed the HAC meant the No. 1 emergency throttle and subsequently reset the No. 1 ETS.

The No. 1 engine was no longer producing power and the helo shook with severe vibrations. The HAC began a descent, slowing the helo. At 300 feet, 65 knots, the No. 2 engine lost power. An autorotation was commenced and the *Sea Knight* splashed down with 35 knots forward velocity and a 5–10 degree, nose-high attitude.

Upon impact the ramp detached, the chin bubbles broke and water began filling the aircraft, which immediately rolled left and went inverted. The *Sea Knight* sank in 150 feet of water.

Except for one passenger who was trapped in the fuselage and drowned, the crew and other passengers egressed safely and were rescued.

Grampaw Pettibone says:

Gol dang it! A sorry show, this one. Sure, an engine did malfunction but so did a couple of brains. Lack of crew coordination made things worse. Would you believe the passengers weren't even given an emergency egress briefing? Plus, they weren't wearing life preservers!

Investigators believe that the No. 1 engine experienced a compressor stall caused by a faulty pilot valve. Naval Air Training and Operating Procedures Standardization says that "recovery can be accomplished by shutting down the affected engine and attempting a restart." The aircrew never tried this. The HAC's response was to arm the ET. He wanted to deactivate the power management system (PMS) in order to assure availability of maximum power in No. 2 while hoping to restore power in No. 1.

The normal power surge of No. 2 at maximum beep might have been misinterpreted as a resumption of power in No. 1. An engineering investigation of the retrieved engine determined that No. 1 was incapable of producing normal power.

Initial steps in any single engine situation at altitude are to maintain rotor rpm, slow to single engine airspeed (70 knots) and turn the PMS off. Activation of the ET is not required until a determination has been made that normal single-engine level flight cannot be maintained. The crew never tried to "just fly the aircraft" and assess its capabilities.

The HAC reduced collective to descend with No. 2 in manual mode for fuel control, with the emergency throttle. Since he was apparently unaware that he was operating with ET, he never beeped the engine back manually to control his power turbine speed. The HAC simply oversped the engine, causing it to shut down as designed when the power turbine

exceeded 124 percent as he lowered the collective.

Crew coordination was minimal. The CP became pretty much a "passenger" after trouble started.

The Boy Scout motto applies: Be Prepared. These folks weren't—and it cost.

What a Wallop!

A section of F-14s and a section of F/A-18s launched from a carrier in the Mediterranean on separate training missions. At approximately 21,000 feet, about 26 miles from the ship, having been cleared en route by foreign controllers, the sections unknowingly converged toward each other.

During a verbal exchange with a ground controller, the lead F-14 swapped positions with its wingman in order to complete a "clean-and-dry" check. Thus, the leader was in wing position as the *Hornets* approached the *Tomcats*.

The following precautionary transmissions were reportedly made to the F-14s by "Echo" control: "Stranger 210, range 12, no height." Then, "Stranger 195, range 15, no height" followed by "Stranger 180, range 6" and "Stranger on the nose at three miles at 108 degrees aspect . . . Merge."

The F-14 leader, while conducting a cross-under from left to right for the clean-and-dry check, heard the six- and three-mile calls. The F-14 in the lead heard nothing before the three-mile call and perceived the traffic to be at his three o'clock position heading in the opposite direction. The F-14 leader (wingman for the moment) moved away to the right of the other F-14 and scanned for traffic along with his radar intercept officer (RIO).

Immediately thereafter, the pilot and RIO simultaneously acquired a *Hornet* directly in their flight path and realized a collision was imminent.

Shortly before this, the lead *Hornet*'s wingman had selected auto acquisition mode on his radar and noted a target at 3.5 miles with a closure rate of 660 knots. A moment later the F/A-18 wingman passed 50 feet below the F-14, which was conducting the clean-and-dry check.

The F-14 tried to maneuver up and to the right, but the F/A-18 leader's aircraft slammed into the *Tomcat*. At impact the *Hornet*'s nose was a little high, wings in a slight left angle of bank. The impact severed two-thirds of the F-14's right wing. The *Hornet* lost five feet of the starboard wing.

In order to maintain flight, the F-14 flew at full afterburner on the right engine, idle on the left, with full left stick and partial left rudder inputs. The *Tomcat* headed for the nearest suitable landing field, but on final approach, 17 minutes later, both engines quit due to fuel starvation (from the leaking wing). The pilot and RIO ejected, landed in the sea and were rescued uninjured.

The *Hornet* proceeded to the same airfield, landed and began hydroplaning. With no arresting cable in sight, the pilot executed a go-around. On the next try, he noted an arresting cable at the threshold of the runway, landed and engaged the cable, which separated immediately without slowing down the F/A-18. The F/A-18 went around again and landed at the far end at 203 knots, engaging the overrun cable at 90 knots and coming to rest three feet from the end of the runway.

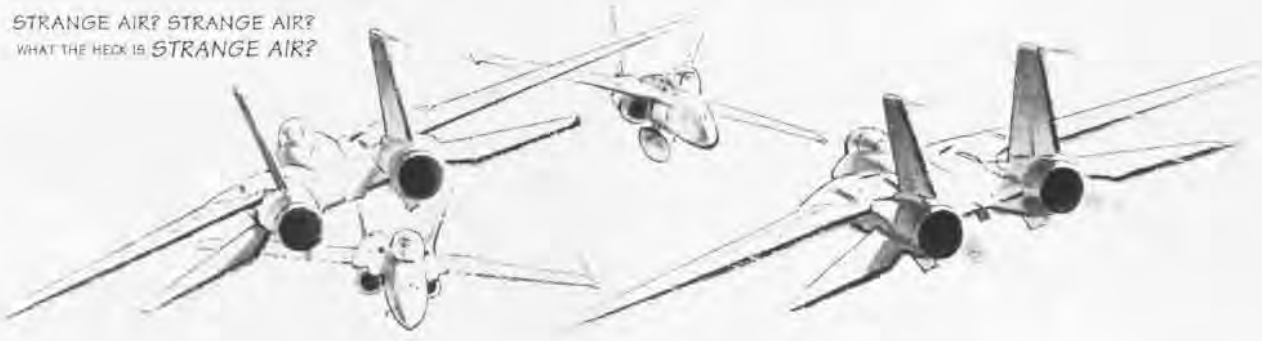
Grampaw Pettibone says:

What a wallop! It's amazin' the two birds stayed in the air.

These were experienced aviators going about their demanding and important business. But they let lookout doctrine take a brief and near-fatal vacation, and it ruined their whole day.

The leaders of the two elements failed to scan the sky in a timely manner. They got confused by calls from a controller with an accent and nonstandard phraseology. The need to switch radio frequencies on departure from the ship, to interpret where the controllers indicated traffic was and to keep an eye on wingmen all conspired against them.

It's a crowded sky wherever you go, ladies and gents. So keep your heads—and eyes—on the swivel.



Aviator Flag News

Adm. Joseph W. Prueher becomes Vice Chief of Naval Operations 1 May; he replaces retiring **Adm. Stanley R. Arthur**. **VAdm. John A. Lockard** relieved **VAdm. William C. Bowes** as Commander, Naval Air Systems Command (NAVAIR), 10 March. VAdm. Bowes assumed duties as Principal Deputy, Assistant Secretary of the Navy (Research and Development).

Eleven Aviators and one Aerospace Engineering Duty Officer (AEDO) were nominated for promotion to Rear Admiral (lower half) by President Clinton. The selectees and their present assignments are: **Stephen H. Baker**, Chief of Staff, U.S. Naval Central Command; **Jay A. Campbell**, Executive Assistant to DCNO (N8); **Robert C. Chaplin**, CO, *Wasp* (LHD 1); **Gregory G. Johnson**, Commander, Carrier Air Wing 3; **James I. Maslowski**, Executive Assistant to the Director, Joint Staff; **Larry D. Newsome**, Program Manager for Maritime Surveillance Aircraft, NAVAIR; **Richard J. Nibe**, CO, *Abraham Lincoln* (CVN 72); **William W. Pickavance, Jr.**, Commander Naval Air Force, U.S. Pacific Fleet (Staff); Paul S. Semko, Commander, Patrol Wing 11; **Robert G. Sprigg**, CO, *George Washington* (CVN 73); **Robert T. Ziemer**, Strategic Studies Group, Naval War College; and the AEDO selectee was **Jeffrey A. Cook**, Assistant Program Executive Officer for Operations, NAVAIR.

RAdm. Barton Dale Strong, Commander, Naval Air Warfare Center Aircraft Division, NAS Patuxent River, Md., was selected for promotion to Rear Admiral (upper half).

New Corps Commandant Announced

Lt. Gen. Charles C. Krulak has been nominated by the president to be promoted to general and become the 31st Commandant of the Marine Corps on 1 July. If approved by the Senate, Lt. Gen. Krulak will replace Gen. Carl E. Mundy, Jr., who will retire. Krulak, a 1964 Naval Academy graduate, is currently Commander Marine Forces, Pacific/Commanding General Fleet Marine Force, Pacific.

1994 Battle E Winners Announced

Naval Air Forces, Atlantic and Pacific announced the 1994 Battle Efficiency Award winners for overall battle readiness:

Atlantic--*George Washington* (CVN 73), VF-142, VFA-105, VA-34, HC-8, VP-24, VS-22, VAW-126, HS-7, VCs 6 and 8, VQs 2 and 6, HSL-46 and VAQ-140.

Pacific—*Kitty Hawk* (CV 63), VF-111, VFA-94, VA-52, HSL-37, VAQ-134, VS-37, HS-2, VAW-115, VP-40, HC-11 and VQ-3.

NAVAIR Breaks Ground at Pax River

The facility to house the Naval Air Systems Command (NAVAIR) when it moves from the current headquarters facilities in Arlington, Va., began with a ground-breaking ceremony at NAS Patuxent River, Md., 17 February. Upon completion the approximately $65 million, five-story, 460,000-square foot building will accommodate the 2,700 transferring personnel. Occupying 16.3 acres, the facility will be located on the site of the old hospital and is scheduled to open by summer 1997.

Final Intruder Ball

VA-128 will host the 29th and final Intruder Ball on board NAS Whidbey Island, Wash., 12 August 1995. All active duty or retired officers desiring to attend are invited to contact VA-128 to receive an invitation. For more information, contact Lt. J. S. McPherson or Lt. R. York at DSN 820-2751 or 360-257-2751, or write to: VA-128, NAS Whidbey Island, 3740 N. Charles Porter Ave., Oak Harbor, WA 98278-6100.

Additionally, VA-128 will display an A-6 tail in the NAS Whidbey Island Officers Club honoring all VA-128 pilot and bombardier-navigator graduates. Each graduate's name will be painted on the tail by date of graduation. Unfortunately, the command files are incomplete and the squadron needs assistance from the active and retired *Intruder* community. Submit VA-128 graduate names (including classmates when possible) with initials and date of graduation by year to VA-128, Attn: Lt. Heimbigner at the above address or via fax to DSN 820-1604 or 360-257-1604.

NASA Will Send Satellite to Moon in 1997

A small Discovery spacecraft called Lunar Prospector has been approved by NASA for a June 1997 visit to the moon for experiments. The project will be led by Lockheed and NASA's Ames Research Center and will cost $73 million. The spacecraft will launch from Cape Canaveral, Fla., and after 110 hours of flight enter polar orbit around the moon at an altitude of 100 kilometers. It will circle the moon every 118 minutes and gather information for one year.

JAST Update

Contracts worth $127 million were awarded for the Joint Advanced Strike Technology (JAST) program's concept definition and design research effort. The contracts are for weapons system concepts; avionics; air vehicle

structures and materials; propulsion concepts/components; and modeling, simulation and analyses. The program goal is to develop affordable technology for the next generation of military tactical combat aircraft, which should replace the F-16, F-14, A-6 and F-111. Additionally, the JAST program is merging with the common affordable, lightweight fighter program, now run by DoD's Advanced Research Project Agency, which includes an advanced short takeoff and vertical landing version as a replacement for the Marine Corps AV-8B *Harrier*.

NADEP Jacksonville Inducts First F-117A Engine

The first F-117A Stealth Fighter engine was inducted into depot-level repair at Naval Aviation Depot (NADEP), Jacksonville, Fla., 6 March. In a ceremony held before over 200 NADEP employees, the first of 60 General Electric F404-F1D2 engines per year was entered into the repair cycle.

Robert Randolph (left) and Jerry Senix at work on a Stealth Fighter engine at NADEP Jacksonville.

Boxer (LHD 4) Commissioned

A new *Wasp*-class amphibious assault ship, *Boxer* (LHD 4), was commissioned 11 February at Ingalls Shipbuilding, Pascagoula, Miss. The ship will transport, deploy, command and support all elements of a Marine landing force conducting assault by air and amphibious craft. Secondary missions will include operating with an aircraft carrier battle group, providing aircraft support and command/control facilities for sea control missions. The 40,500-ton ship is 844 feet long with a beam of 106 feet. It will be crewed by 980 enlisted and 97 officers, has more than 22,000 square feet of vehicle space, 100,000 cubic feet of cargo space and can accommodate nearly 2,000 troops. The ship and crew will be home-ported at NS San Diego, Calif. Following *Boxer*, Ingalls has *Bataan* (LHD 5) and *Bon Homme Richard* (LHD 6) under contract and in production, and a contract option for LHD 7.

MH-53E Approved for Low-Level Test

The Naval Air Systems Command has given approval for HM-18 (now HM-14) to evaluate MH-53E recovery of Explosive Ordnance Disposal personnel from the water by utilizing a Jacob's Ladder (a marine ladder of rope with wooden rungs) during low-level operations. Previously, the MH-53E was not used due to its rotor wash and static discharge. Although the aircraft does produce a heavy down wash, once it has established a low, overwater hover, the rotor wash is relatively calm directly under the aircraft and thus allows safe recovery of personnel. The aircraft discharges static electricity by lowering its grounding strap on the utility hoist into the water.

Corporate News

Chrysler Technologies Airborne Systems, Inc., was awarded a $95.5 million contract to modify U.S. Navy E-6A TACAMO (take charge and move out) aircraft, which will become the E-6B to give it the capability of the U.S. Strategic Command's EC-135 Airborne Command Post aircraft. The TACAMO aircraft is a Boeing 707, modified to receive and transmit messages from the National Command Authority to strategic forces. The upgrade includes adding a MILSTAR satcom terminal, Global Positioning System, a new mission computer system and secure telephone and fax equipment. The six-aircraft modification is expected to be completed in July 1998.

Titan Corporation will perform selected additional tasks under an existing Miniaturized Demand Assigned Multiple Access (Mini-DAMA) contract, worth $12 million, in order to produce Mini-DAMA satellite communications terminals for installation on Navy aircraft. The new project adds $677,000 to the contract and will make it possible for Navy aircraft to operate in the same key communication nets that have previously been available only to ships and shore stations.

Rockwell was awarded the 60 percent majority share of the Joint Tactical Information Distribution System full-rate terminal production by DoD. The basic contract, worth $18.8 million, is for a total of 30 terminals and terminal spare sets for use aboard Navy ships and Air Force Joint Surveillance and Target Attack Radar System aircraft. Options for an additional 23 shipboard high-power terminals and spares for Navy and foreign military sales requirements for Italy and France are also included in the contract. Rockwell also announced that its Rockwell Defense Electronics won a $42 million production contract for the AN/ARC-210 Electronic Protection Multimode Integrated Communications System from the Naval Air Systems Command. This contract provides electronic-protected communications systems for joint service interoperability. The ARC-210 enables the user to communicate with all branches of the U.S. and NATO forces, the Civil Air Traffic Control system and land mobile and maritime users. Aircraft benefiting from this contract include the F/A-18, C/MH-53, CH-46, EA-6B, AV-8B and UH-1N.

The Naval Air Warfare Center Aircraft Division awarded a $9.8 million technical and engineering services contract to **DCS Corp.**, Alexandria, Va., for a ground proximity warning system.

Fairchild Space & Defense was awarded a $12.1 million contract for design and engineering services in support of spacecraft development. The contract contains two option years, which, if exercised, will bring the total cumulative value of the contract to $37.1 million.

AT&T won a $35.6 million contract for 126 AN/UYS-2A(V) SEME production units and kits. The AN/UYS-2 is the Navy's next-generation standard signal processor for ship, shore, submarine and aircraft antisubmarine warfare. AT&T also won a $119 million contract to supply the United Arab Emirates armed forces with digital communications equipment to be used both in the field and in offices.

The Navy's F/A-18 and EA-6B aircraft will be equipped by **Litton** with a new navigation system that combines the latest laser gyro technology

with a precise Global Positioning System (GPS) receiver in a single, lightweight unit called Embedded GPS/Inertial system. The program could include the purchase of as many as 2,000 units. Additionally, Litton announced the successful completion of developmental testing of the AN/ALR-66B(V)3. This will pave the way for production by the company's Applied Technology Division of more than 200 modification kits. The kits will be installed as upgrades to the ALR-66A(V)3 systems presently employed as the standard radar warning receiver, electronic support measures and targeting system on the P-3C aircraft.

Boeing Co. offered an early-retirement incentive to 13,000 workers to help reduce the number of layoffs it will have to make this year. Employees eligible for the retirement program are mainly those 55 or older who have worked for the company at least 10 years. The program will be available between 14 April and 16 June. In addition, it is retroactive to 1 January and will cover eligible workers who already have retired or been laid off this year.

Lockheed Martin Corp. was formed 15 March when Lockheed and Martin Marietta merged. With annual sales of about $23 billion and a total of 170,000 employees, the new corporation is a highly diversified advanced technology company with core businesses in aeronautics, electronics, energy and environment, information and technology services, and space and missiles. Lockheed Martin is headquartered in Bethesda, Md.

TRW, Inc., announced that it had won a $43.8 million contract from DoD to provide logistics support for a tactical unmanned aerial vehicle program.

Sanders, an operating company of the Lockheed Martin Corp., was awarded two contracts worth $11.7 million for aircraft defensive electronic countermeasures systems for the governments of Italy and Malaysia. Sanders will produce four AN/ALQ-126B systems for Malaysian F/A-18 *Hornets* and four AN/ALQ-164 systems for Italian navy AV-8B *Harriers*.

FPT Industries was selected to supply the flexible fuel tanks for the V-22 *Osprey*. The tanks will be manufactured by ILC Dover and are made of a new material, Hycalite, developed by FPT specifically for applications where lightweight, crashworthy structures are required.

Jeppesen & Co. and Lufthansa German Airlines announced that Jeppesen will take over all charting services for Lufthansa 1 July under a broad cooperation agreement between the two companies.

Loral Corp's Aeronutronic Division won a $38.7 million contract to build 1,784 AIM-9M/S guidance and control sections for the U.S. Navy and seven allied countries. The contract includes components for Finland, Taiwan, Belgium, Korea, Singapore, Malaysia and Turkey.

American Innotek, Inc., developed the Flight Extender II, a new product for more convenient flight crew urination while flying. The product works well for men and women aboard all types of aircraft, fits in a pocket of the flight suit and is spill-proof, odorless, sanitary and nontoxic. Its unique blend of absorbent polymers and enzymes turn urine into an odorless gel and can then be disposed of in any trash container. It meets all federal and state disposal requirements and is available through the military supply system.

NAS Pensacola Ground-Breaking

A ceremony was held 14 February to break ground for a new Naval Air Technical Training Center to be built at historic Chevalier Field, NAS Pensacola, Fla. The field was named for LCdr. Godfrey de Courcelles Chevalier, an aviation pioneer who made the first landing aboard *Langley* while under way on 26 October 1922. The field was finally closed 1 November 1965 after it was made obsolete by the newer Sherman Field. The new training center will cover the field. A contract worth $227 million for the construction of a consolidated training school, nine bachelor quarter facilities, a galley and extensive site work was awarded to the George Hyman Construction Co., Bethesda, Md. The work is scheduled for completion by November 1996.

TAMPS 6.0 Comes to El Toro

In February HMH-164, MCAS El Toro, Calif., became the first operational unit in the military to receive the Tactical Aircraft Mission Planning System (TAMPS), Version 6.0. The equipment processes all details of a flight plan after the pilot tells the computer the intended flight path, weapons load and amount of fuel on board. TAMPS then provides the most current weather and intelligence information and prints the flight plan. In seconds the computer completes research that would normally take an hour or more to accomplish. The system draws information from various data bases to provide current and accurate information for the flight plan. (See TAMPS article, p. 26.)

HMs 14 and 18 Integrate

HM-18 officially disestablished 4 March and integrated with its regular Navy counterpart, HM-14, forming a squadron of over 700 personnel. The new unit will resemble HM-15, which accomplished a similar integration last year with HM-19. (See *NANews*, Mar–Apr 1995, p. 8.)

AIM-9X Moves Ahead

The next generation of Sidewinder air-to-air missile, AIM-9X, moved into an 18-month demonstration and validation phase with the awarding of contracts worth $24.9 million and $22 million to Raytheon Co. and Hughes Missile Systems Co., respectively. The new phase will include ground and captive flight tests of advanced, wide-angle focal plane array seekers and is planned to last until autumn 1996. Production plans of up to 10,000 AIM-9X missiles could be worth over $1.5 billion.

HC-4 Transitions to MH-53Es

HC-4 is transitioning to MH-53E *Sea Dragons* from the CH-53E *Super Stallions*

Lt. Ted O'Neil

An HC-4 CH-53E shown plugging over the Indian Ocean.

which it brought to NAS Sigonella, Italy, in 1983. A Marine Corps shortfall of CH-53E airframes led the Navy to replace HC-4 CHs with MHs, which were available from HMs 14 and 15 after their integration with HMs 18 and 19. The CHs will be available for the Marines when the transition is completed in 1996. Initially designed for the airborne mine countermeasures mission (AMCM), the newer MH-53Es that HC-4 has were stripped of most AMCM equipment. The aircraft have an improved avionics package, different handling characteristics in close proximity to the ground due to a burble effect created by their unusually shaped sponsons, a different fuel system and a newer tail rotor system.

Aircraft Mishaps

An **AV-8B** *Harrier* from VMA-214 deployed aboard *Essex* (LHD 2) in the Indian Ocean crashed 30 January during a routine night training flight. The pilot, Capt. Raymond N. McKay, was declared lost at sea after rescue efforts were unsuccessful. The aircraft had just launched from the ship and was two miles ahead when contact was lost.

An **SH-60F** *Seahawk* from HS-14 assigned to *Independence* (CV 62) crashed at night 15 March 110 miles off the east coast of Japan. Pilot Lt. Todd Flannery was treated for a broken leg, copilot Ens. Gust Sparangis was treated for minor injuries, but AW1s William Quinn and Humberto Escobar were lost at sea. The aircraft and crew were conducting plane guard duties at the time of the crash.

A **T-34C** *Turbo-Mentor* from VT-28 on a routine training mission crashed in the Gulf of Mexico 14 February near Corpus Christi, Texas, killing the instructor pilot, Lt. David J. Huber. The student pilot, Ens. Joseph W. Moorehouse, survived the accident with serious injuries. The aircraft wreckage was located by a coastal minehunter utilizing the ship's equipment normally used to search for mines. *Gladiator* (MCM 11) located a general area to search, then *Dextrous* (MCM 13) located the wreck site. The aircraft was salvaged by *Mohawk* (T-ATF 170) 25 February and delivered to NS Ingleside, Texas.

VP-47 lost a **P-3C** *Orion* 24 March when it went down five miles off the coast of Oman due to engine trouble. All 11 aircrew members were rescued by Oman air force helicopters and treated for minor injuries.

An **F-14** *Tomcat* from VF-14 crashed 23 March about 75 miles off the Virginia coast while conducting a routine training mission. The two aircrew members, Capt. Vance C. Bateman, USAF, and Lt. Jerry Seagle, USN, were rescued by NAS Oceana Search and Rescue and treated for mild hypothermia and released.

A Marine **UH-1N** *Huey* based aboard *Essex* (LHD 2) crashed 20 February 25 miles southeast of Mogadishu, Somalia, while on a training mission. Four aircrew members were safely recovered with minor injuries, but Sgt. Justin A. Harris was lost at sea.

Air Force Reducing to 20 Fighter Wings

The U.S. Air Force will reach its goal of 20 fighter wings by the end of 1996. The 20 wings of 72 aircraft each will be composed of 13 active duty and 7 Air Force Reserve and Air National Guard units made up of F-15, F-15E, F-16, F-117 and A-10 aircraft.

Korean War Veterans Memorial Dedication

The dedication of the Korean War Veterans Memorial will be celebrated 26–29 July on the Mall in Washington, D.C. More than half a million people are expected to attend, including both President Clinton and President Kim Young Sam, as well as troops and diplomatic representatives of 20 allied countries. The memorial lies in the shadow of the Lincoln Memorial and along with the Vietnam Veterans Memorial, completes the west end of the Mall. It consists of 19 larger-than-life troopers on a cold, windswept patrol. They march toward an American flag, which symbolizes the goal of liberty and justice for all. The faces of more than 2,400 support personnel look on, gazing from a 164-foot black granite wall where they are softly etched into a mural. Beyond the flag lies the "Pool of Remembrance," a contemplative 70-foot-wide, tree-shaped pool commemorating those who were killed, captured or wounded, or are still listed as missing in action.

New River Has First MV-22 Simulator

MCAS New River, N.C., has received the first MV-22 *Osprey* simulator in the Marine Corps. The simulator represents the V-22 development aircraft (which is being flown at NAS Patuxent River, Md.) and will accommodate two pilots, an instructor and two observers. New River is slated to receive the first production MV-22 in 1999 when HMT-204 will train aircrew in the new aircraft.

International News

The **Czech Republic** awarded a $20 million contract to Rockwell International to design and integrate avionics on the country's L-159 combat trainer aircraft. The company will conduct a 33-month prototype development effort and the transition to a production program. Seventy-two aircraft will be fitted with the new avionics suite; the first is planned for 1998. The total value of the program could reach $200 million.

Lebanon purchased 16 used UH-1 *Hueys* for its army to use in internal security. The aircraft will be refurbished by UNC Helicopter, Inc., Ozark, Ala., with delivery possible as early as July 1995. UNC is the sole contractor for refurbishment of UH-1s for foreign military sales. Since winning the refurbishment contract in 1991, the company has completed 140 aircraft for various countries, including 30 for Greece, 14 for Singapore, 12

for Tunisia, 8 for Chile and 10 each for the Philippines, Colombia and Thailand.

Rockwell Defense Electronics announced plans to open a Pacific Rim Service Center in **Singapore** in June 1995. Through Rockwell's Collins Avionics & Communications Division, the new service center will provide product repair and technical support for defense communications and navigation products and systems customers throughout the region. It will also help support authorized Rockwell dealers that carry Collins products throughout the Asia-Pacific area.

The first Hawker U-125A Search and Rescue aircraft was formally handed over to the **Japan** Air Self Defense Force (JASDF) on schedule 28 February. The ceremony, which also included a formal Shinto blessing of the aircraft, took place at the Fuji Heavy Industries plant at Utsunomiya, north of Tokyo. The JASDF received two additional U-125As in March, has two more on order and has options on another 22 aircraft. Features in the aircraft include a 360-degree search radar, a forward-looking infrared system, thermal imager, marker flare dispensing system, dinghy and rescue equipment dropping capability, and large observation windows.

Westland Helicopters will deliver the first of six new Mk. 3a search and rescue (SAR) *Sea Kings* to the **U.K.** Royal Air Force (RAF) this summer for a $78 million contract. The Mk. 3a is equipped with a Thorn EMI color radar, Racal RNS 252 navigation computer, Rockwell-Collins VHF/UHF radios for improved communications and a new SN500 Smith-Newark automatic flight control system. Westland will deliver all six new aircraft to the RAF by the end of next year, bringing the RAF's SAR *Sea King* fleet to 18.

Croatia has added a number of Mi-24V *Hind-E* gunships and up to 30 more MiG-21 *Fishbeds* to its inventory.

The **Italian** army will take delivery of five Agusta-Bell 212ASW helicopters built to meet an Iraqi order, which was embargoed due to the Gulf War, after several years of storage at Agusta's Vergiate facility. The aircraft were to have served on four frigates also ordered by Iraq but similarly now absorbed into the Italian navy.

The Royal **Cambodian** Air Force will acquire six Aero L-39 *Albatros* advanced jet trainers following upgrade by Israel. Four helicopters acquired from the Ukraine, believed to comprise two Mi-8 *Hip* and two Mi-17 *Hip-Hs* are already in service, supplementing eight Mi-8s and three Mi-17s. Six unspecified basic trainers have also been acquired, while work commenced in January on the upgrade of some of the 19 MiG-21s acquired from the Soviet Union in the 1980s.

Indonesia plans to procure over $2 billion worth of military equipment, including more fighter and trainer aircraft, over the next five years. Major purchases include a follow-on order for 20 Hawk 100/200s, 5 Lockheed F-16A/Bs, 2 new in-flight refueling tankers, 16 UH-60 *Black Hawks* and 16 smaller training helicopters.

The **Republic of China** air force has taken delivery of four Grumman E-2T *Hawkeye* airborne early warning aircraft under a $700 million contract. Fitted with the AN/APS-138 radar, the E-2T is a modified land-based variant of the carrier-borne E-2B. The aircraft will provide Taiwan with an increased warning time against possible air attack.

Naval Aviation Base Closures/ Realignments

The following have been recommended for closure/ realignment on DoD's 1995 Base Realignment and Closure list released 28 February: NAF Adak, Alaska; NAWCAD Indianapolis, Ind.; NAS South Weymouth, Mass.; NAS Meridian, Miss.; NAWCAD Warminster, Pa.; NAS Key West, Fla.; NAS Corpus Christi, Texas; NTTC Meridian, Miss.; NAESU Philadelphia, Pa.; NAWCAD Open Water Test Facility, Oreland, Pa.; and Naval Air Reserve Center, Olathe, Kans.

Deactivated...

HMT-301

Marine Helicopter Training Squadron (HMT) 301 was deactivated 31 December 1993 at MCAS Tustin, Calif., after nine years of service.

Activated in December 1984, HMT-301 became the Pacific Fleet Marine Force readiness squadron for CH-46E *Sea Knight* assault transport helicopters. It trained pilots, crew chiefs and maintenance personnel to fly and maintain the CH-46. The squadron was deactivated in order to consolidate CH-46 training with HMT-204, MCAS New River, N.C.

HMT-301 is scheduled for reactivation at MCB Hawaii (formerly MCAS Kaneohe Bay) during the summer of 1995 as the CH-53D readiness squadron.

VMO-4

A 16 April 1994 ceremony at NAS Atlanta, Ga., marked the deactivation (officially 31 March) of Marine Observation Squadron (VMO) 4, the last Marine Corps squadron to operate the OV-10 *Bronco*. Lt. Col. Mark W. Bircher was the last CO of VMO-4.

Activated at Quantico, Va., 20 December 1943, VMO-4 was formed to provide artillery spotting services using the OY-1 *Grasshopper* light observation plane. Entering combat in June 1944 against the Japanese on the island of Saipan, VMO-4 made the first carrier launch of an OY-1, from *White Plains* (CVE 66). During 56 days in the Saipan campaign, VMO-4 crews flew 426 combat missions, but lost half of its pilots and one third of its aircraft.

VMO-4 was the first squadron to land in Iwo Jima during the February 1945 invasion of that island. Operating from Maple Field, the squadron flew 194 missions, spotting for artillery and firing on enemy forces. Two OY-1s were kept airborne from dawn to dusk, their mere presence over enemy positions curtailing enemy mortar and artillery fire.

Deactivated 21 October 1945, VMO-4 was reactivated

1 September 1966 as a Marine Corps reserve squadron at NAS Grosse Ile, Mich., flying UH-34D *Seahorse* helicopters. In 1972, with Marine presence in Vietnam winding down, VMO-4 retired its helicopters and acquired nine OV-10As, moving to NAF Detroit, Mich., within a year. On 1 October 1976 the squadron moved to NAS Atlanta, after absorbing the assets of sister squadron VMO-8 when it was deactivated 1 August 1976.

VMO-4 became the first OV-10 squadron to achieve 50,000 mishap-free flight hours, and extended that record to 64,000 hours before deactivation. Since the 1980s, the squadron participated in Joint Task Force 4 drug-interdiction operations in the Caribbean region. In 1990 VMO-4 took part in an exercise in Honduras. Called to active duty in 1991 during Operation Desert Storm, VMO-4 augmented its two regular counterpart squadrons, VMOs 1 and 2, when they deployed to Saudi Arabia.

On 29 May 1991 VMO-4 received its first OV-10D+ aircraft. The squadron deployed numerous OV-10D+ detachments to the southwestern U.S. in support of Joint Task Force 6 drug-interdiction operations.

Disestablished...

VP-60 Cobras

A 20 March 1994 ceremony at NAS Glenview, Ill., marked the disestablishment (officially 1 September) of Patrol Squadron (VP) 60 after over 24 years of service. Cdr. Brian P. Burghgrave was the last CO of the *Cobras*.

VP-60 was established at NAS Glenview 1 November 1970 as a reserve force squadron, formed from numerous detachments of personnel from Glenview and NAS Twin Cities, Minn. Initially, the squadron was equipped with SP-2H *Neptune* patrol planes, but in March 1974 switched to the P-3A *Orion*. In March 1980 the *Cobras* acquired the P-3B, and in February 1984 upgraded to the TACNAVMOD (tactical navigation modification) version of the P-3B.

Although one of six squadrons assigned to Commander Reserve Patrol Wing, Pacific, VP-60 ranged worldwide in its operations in support of the fleet. Augmenting active duty VP squadrons, the Cobras sent detachments to Japan, the Philippines, Korea, Thailand, Malaysia, Singapore, Guam, Bermuda, England, Portugal, Spain, Norway, Alaska and Hawaii. The squadron participated in Unitas exercises in Brazil, Uruguay and Argentina and flew drug-interdiction operations from several sites in the Caribbean.

During its last year of operations, VP-60 deployed detachments all over the Pacific, from Adak, Alaska, to Singapore. During a live *Harpoon* missile shoot, the squadron was the first P-3B unit to utilize alternative targeting information to gain a missile firing solution. The *Cobras* ceased flight operations on 28 March 1994, closing out their history with nearly 85,000 mishap-free flight hours.

VP-67 Golden Hawks

A 5 March 1994 ceremony at NAS Memphis, Tenn., marked the disestablishment (officially 30 September) of Patrol Squadron (VP) 67 after over 24 years of service. Cdr. Stephen J. Kuhar was the last skipper of the Golden Hawks.

VP-67 was established at NAS Memphis 1 November 1970 as a reserve force squadron assigned to Commander Reserve Patrol Wing, Pacific. The squadron was formed from a merger of three reserve squadrons based at Memphis and NAS Olathe, Kans.: VPs 17M1, 60M2 and 68M3. Flying the SP-2H *Neptune* for the next seven years, the *Golden Hawks* sent detachments to Columbia, El Salvador, Spain, Hawaii, Bermuda and Key West, as well as bases in the continental U.S.

From July 1977 to July 1979, the squadron transitioned to the P-3A *Orion*. During this period, the squadron also provided SP-2H transition training for Argentine navy aircrews. In 1980 VP-67 began the first of its P-3A overseas detachments, operating over the next five years from Guam, Okinawa, the Philippines, Singapore, Thailand and Japan.

In May 1985 VP-67 received its first P-3B TACNAVMOD (tactical navigation modification) aircraft, and was fully qualified in its new aircraft only six months later. Over the next 10 years, the *Golden Hawks* sent dets to familiar sites in Japan, Okinawa, Alaska and Guam. Its operations included tracking Soviet submarines. During the 1990s the squadron also sent detachments to Howard AFB, Panama, flying drug-interdiction operations, and supported three Unitas exercises in South America. VP-67's last overseas detachment operated from Brazil.

Rick Burgess contributed the deactivation/disestablishment articles.

VP-90 Lions

A 19 March 1994 ceremony at NAS Glenview, Ill., marked the ceremony (officially 30 September) of Patrol Squadron (VP) 90 after over 24 years of service. Cdr. G. M. Black was the last CO of the *Lions*.

VP-90 was established at NAS Glenview 1 November 1970 as a reserve force

squadron flying the SP-2H *Neptune*. In March 1974 the squadron began transitioning to the P-3A *Orion*. The *Lions* switched to the P-3B beginning in February 1981 and upgraded to the TACNAVMOD (tactical navigation modification) version of the P-3B in September 1983.

Assigned to Commander Reserve Patrol Wing, Pacific, VP-90 ranged worldwide in support of fleet operations and exercises, including tracking Soviet submarines during the cold war and participating in drug-interdiction operations and Unitas exercises.

Corrections

Mar–Apr 1995: p. 36—An item under Scan Pattern in "People–Planes–Places" should have stated that VFA-127 and VF-45 will be disestablished vice VFAs 127 and 45.

p. 38—The photo caption for the 1994 Annual Winner of the ANA Photo Contest should have read: "Ted Carlson photographed three VF-41 Black Aces as they lined up after refueling from a 163rd ARG California Air National Guard KC-135E over Colorado on their way to a CVW-8 deployment to NAS Fallon, Nev."

Hub of the Med

NAS Sigonella

Compiled by Lt. B. A. Burfeind

A wide expanse of wheat fields, citrus groves and rural farmland has filled the open plain on the southern side of Mount Etna since Roman times. From that plain arose Naval Air Station, Sigonella, Italy, beginning in 1957, with the first aircraft landing in June 1959.

Since that first landing, the compact North Atlantic Treaty Organization (NATO) base has blossomed into several small bases with operations spread across the southeastern coastal

plain of Sicily. The facilities include NAS I and NAS II, Augusta Bay port services, Niscemi Antenna Site and Pachino Target Range.

NAS Sigonella is a tenant of NATO Base Sigonella, commanded by an Italian air force colonel. The field is shared with the Italian air force's 41st Stormo, which operates a maritime patrol squadron on the eastern half of the airfield and maintains a ready alert force of F-104s.

Though Sigonella does not appear on most maps of Sicily, many Sixth Fleet sailors know the station, because they've either passed through the busy air terminal or been aboard ships in nearby ports.

NAS Sigonella, ideally located in the central Mediterranean, works to

Opposite, ruins, lava rock and cacti are prevalent throughout Sicily. Above, a formation flight of HC-4 CH-53E Super Stallions .

keep the fleet steaming and aircraft flying. The air station provides repair and logistics support to a broad range of operational forces that include the Sixth Fleet, the Navy's sister services and NATO allies.

Operational fleet support is provided to Sigonella-based patrol squadrons, the NATO Maritime Patrol Airfield and carrier air wing detachments. Augusta Bay acts as an operational port with a cold iron plant, and refueling and ammunition resupply capability. Recently, the U.S. Air Force signed a Memorandum of Understanding with the Italians to deploy up to 12 F-16s to Sigonella for routine training. The Marine Amphibious Ready Groups have had helicopter/AV-8B detachments at Sigonella, and the station also provides Deny Flight weapons support to Marine F/A-18s at Aviano Italian air base.

Logistics support is provided by Helicopter Combat Support Squadron (HC) 4, Fleet Logistics Support Squadron 40 and NAS Sigonella's three C-12s and one CT-39, as well as by the Air Mobility Command (AMC) and three reserve fleet logistics support squadron detachments. An AMC detachment of 30 Air Force personnel (621 AMSG) acts as coordinator for the heavy AMC transfer point and refueling stop. As NAS Sigonella changes to meet the Navy's many needs, its logistics support function exceeds that of fleet support.

NAS Sigonella's value to U.S. and NATO interests in the Mediterranean was rediscovered during Operations Desert Shield and Desert Storm when numerous support missions originated from its airfield and a large number of people and aircraft used Sigonella as a stopover on the way to Saudi Arabia. Joint and combined operations continue with ongoing NATO maritime patrol and reconnaissance missions supporting Operations Sharp Guard and Deny Flight.

The closure of bases in Subic Bay, R.P., has added to the flow of passengers and cargo now coming through the Mediterranean by way of NAS Sigonella. Traffic destined for Bahrain, southwest Asia, northern Iraq, Rwanda and Somalia now passes through NAS Sigonella. As a result, Sigonella has become the AMC's second busiest passenger air terminal in the European theater, following several years of increasing airfield and air terminal operations. In 1994, 88,194 passengers and 17,730 tons of cargo passed through the facility.

NAS Sigonella is also home to one of the busiest and largest Aircraft Intermediate Maintenance Departments (AIMD) in the theater, providing repair capability for six rotary and four fixed wing aircraft types. The air station supports detachment sites throughout the Mediterranean and the Central Command, with sites located in Turkey, Saudi Arabia, Bahrain and Hurghada, Egypt. Through the AIMD, NAS Sigonella has also taken on the business of repairing shipboard gas turbines. Twice in the past year, AIMD personnel assisted in complete engine replacements on ships pierside in Augusta Bay.

NAS I and II are in a constant state of high energy and activity. The joint U.S. and NATO airfield operations at NAS II have remained constant and actually grown in some areas since the completion of Desert Shield/Desert Storm.

However, this high tempo of operational activity places continual pressure on the base support infrastructure at both facilities. Despite the pressure, there is a dedicated effort to locate additional family housing and increase and improve all quality-of-life programs.

Military members, Department of Defense civilians and their families and the many transients passing through Sigonella often experience housing shortages. Temporary apartments and apartment buildings have sprung up in nearby towns, such as Motta San Anastasia, filling some of the gap. Ongoing base housing and barracks renovations and construction are also helping alleviate the shortage.

Exotic Sicily

Sicily is an island of exotic extremes. From bustling modern cities to quaint picturesque villages tucked into the mountain side. From sandy white beaches to a coast lined with jagged, black lava rock. From massive luxury yachts to tiny, wooden fishing boats carefully crafted by their owners.

An island of 6 million citizens, Sicily measures 160 miles in length and varies in width from 30 miles at its western end to about 110 miles on the east. Separated from the mainland of Italy by the straits of Messina, it is the largest island in the Mediterranean.

Sicily has a lot to offer with its 10,000 square miles. You can hike up close to Mt. Etna's active crater in the summer, or ski down its snowy slopes in the winter. You can sunbathe on its beaches or explore its beautiful underwater world by scuba diving.

The island is very active in the theater and arts. Plays and operas are often performed outdoors during the summer in the ruins of many of the islands magnificent, ancient amphitheaters.

Sicily offers something for everyone.

The island of Sicily

The completion of the U.S. Naval Hospital in January 1993 provided a major quality-of-life improvement for the Sigonella community. The availability of increased medical and dental services meant that, for the first time, residents could receive all elements of health care on base. Previously, patients needing special care (such as obstetrics, gynecology or orthopedics) were medevaced to Naples, Italy; Rota, Spain; or Germany.

Veterans of Sigonella repeatedly tell new residents how much the base has changed over the past few years. This is especially true since the completion of the NAS I mini-mall, the Navy Exchange Home Center renovations and the many other new facilities and services. Visitors quickly discover

A Sigonella fire truck and a C-9 Skytrain II face off.

that things just keep improving at NAS Sigonella.

Off-duty hours are easily filled with exploring the colorful local markets, trying the wide variety of delicious Italian food at local eateries, and visiting a number of scenic and historic sites. "There are more Greek ruins here than there are in Greece; more Norman castles than in Normandy," according to Captain Stewart R. Barnett III, Sigonella's commanding officer. "There are some amazing things to see here. You can take a day trip every weekend for a year and not see everything there is to see on the island."

Weekly tour buses travel to on-island locations, such as Siracusa, Messina, Catania, Nicolosi, Enna, Ragusa, Patti, Piazza Armerina, Taormina and Palermo. Off-island trips include Rome, Greece and Egypt. Space-A travel via the Air Mobility Command is available to virtually anywhere in Europe and southwest Asia. Sigonella is no longer a "sleepy hollow," nor is it the well-kept secret it once was. Sigonella is truly "the hub of the Med." ■

Lt. Burfeind is the Public Affairs Officer for NAS Sigonella.

AS3 Chad Vanderbeek signals an outgoing aircraft forward as he directs traffic on the NAS Sigonella flight line.

AN C. Malley

NAS Sigonella and Tenant Commands

CO: Capt. Stewart R. Barnett III
CMC: AVCM(AW) Fred Orlowske

	DSN 624–xxxx
American Forces Network (AFN)	4265
Air Force SEC	4536
CINCUSNAVEUR P-3 DET (VP-26)	5628
COMHELWINGSLANT DET	5325
DCS	5329
Defense Commissary Agency (DECA)	4303
Dental Clinic	4205
DET2 621 AMSG (Air Mobility Command)	5640
DFQAR	5790
DODD School (Stephen Decatur School)	4281
DRMO	5583
EODMU EIGHT	6413/6523
EODMU EIGHT DET	5367
FLIMAGCENTLANT	6531
HC-4	6676
ISSOT	3792
MOMAG UNIT 5	5359
NAESU	5386
NAVMASSO	5935
Navy Campus	4492
NAVCOMTELSTA	5525
NCTSI DET 4	5645
NCIS	5688
NEMOD	6020
NISCEMI	5736
NLSO	5258
NMCB-DET	5871
PSD	5656/5300
ROICC (DEPUTY)	5661
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U.S. Naval Hospital	4809/4802
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This article continues our Naval Air Station/ Facility Series. Public Affairs Officers are encouraged to contact the Editor for scheduling. MCAS New River, N.C. will appear next.

Plane Captains... Takin' Care of Business

By JO2 Jerry Knaak

JO2 Jerry Knaak

JO2 Jerry Knaak

Launch crew coordination is vital to successful flight operations. Top, AMSAN Edward A. Silva gives a VF-102 Tomcat pilot the signal to start the No. 2 engine. Above, AMSAN Silva holds up the landing gear safety pins for the pilot's inspection.

All sailors new to the Navy must "pay their dues," whether it is a temporary assignment to a ship's galley washing dishes or handing out towels at the base gym. In Naval Aviation, the phrase "pay your dues" takes on a whole new meaning when it comes to the men and women assigned to squadron line shops. These sailors are responsible for general servicing, appearance and launch and recovery of aircraft. They also handle fueling and daily inspections, and ensure the integrity and flight safety of multimillion-dollar planes and helicopters. The highly trained and motivated people who attack these daily responsibilities are known as Plane Captains (PCs).

One might think that such responsibility is handed to the most qualified senior enlisted people in the squadron. On the contrary, the majority of the men and women who inspect and service naval aircraft are 19 and 20 years old—fresh out of apprenticeship training, boot camp or a rating-specific "A" school. Many of these "rookies" are initially assigned to squadron line shops, where they are exposed to every facet of squadron and aircraft operations.

Although most line crew members receive a good portion of their training in the shop under the tutelage of a line shop supervisor or senior Plane Captain, Naval Aviation Maintenance Training Activity Group Detachments (NAMTRAGRUDETs) offer a three-week course in Plane Captain fundamentals. According to Aviation Machinist's Mate First Class (AD1) Harold F. Fritts, an instructor at NAMTRAGRUDET 1007 for the F-14 *Tomcat* at NAS Oceana, Va., the classroom is designed to work with on-the-job training (OJT)—seeing a prospective Plane Captain through to completion and qualification. "The classroom is used for familiarization. It gives students an overall view and helps them decide what job they want to do in the Navy," Fritts explained.

Individual squadrons decide if and when a Plane Captain candidate will attend the formalized training course. Many times, due to operational commitments, budget constraints or other circumstances, sailors are not afforded this opportunity. In the meantime, they are subjected to rigorous OJT.

Their training covers everything from PC-to-pilot hand signals to completing required maintenance-related paperwork. Most of what a prospective PC learns about the aircraft is hands-on, repetitious, day-in/day-out, manual labor-intensive work. But according to Attack Squadron (VA) 34, NAS Oceana, Va., Line Shop Leading Petty Officer AD1 Gary L. LaPorte, in-shop, organized instruction encompasses approximately 50 percent of a PC candidate's training. "You have to train them in the use of maintenance publications and paperwork. We have several manuals and Maintenance Requirement Cards that they have to study before they can actually go out on the aircraft and do their job." AD1 LaPorte also stated that safety is always paramount.

Andrew L. Gasser is a 22-year-old Aviation Electronics Technician Third Class (AT3) who serves as the Fighter Squadron 102 day-shift line supervisor. He says the responsibility placed on him and his coworkers is substantial. "My responsibilities are to make sure all the jets have assigned Plane Captains and that turnaround and daily inspections are completed. If any problems arise, I try to handle them," he said.

AT3 Gasser and his counterparts are typically the first to arrive for work in the morning, and the line shop's night crew is the last to leave when the day is over. This is especially true during heavy flight operations. Plane Captains are also responsible for foreign object damage debris walkdown participation, physical security of aircraft and maintaining all squadron-assigned ground support equipment (GSE)—all of which takes place before a pilot or aircrew member can strap on a G suit. PCs must be qualified to operate numerous types of GSE, such as tow tractors and portable power supplies. Each piece of gear requires that the operator attend a class and pass an

PH3 Jason Marzini

Airman Mary Garcia, a VF-126 PC, performs preflight checks with a TA-4J Skyhawk pilot during flight operations at NAS Miramar, Calif.

PH2 Edward Delcoach

Airman Terry Horn of VF-21 uses hand signals to communicate with other crew members on the flight deck during Operation Southern Watch aboard Independence (CV 62). Conditions on an aircraft carrier require the use of such signals during noisy flight operations.

exam to become licensed to operate it.

Pilots, Naval Flight Officers and Enlisted Aircrewmen must work hand in hand with PCs to ensure flight and ground crew safety. After a particular crew receives an extensive flight briefing, dons the appropriate flight gear, reviews the maintenance discrepancy logs and fills out the necessary paperwork, it's time to walk out to the assigned aircraft. They are greeted by the Plane Captain who escorts them on a walkaround inspection. During the inspection, the PC updates the crew about any maintenance activity that has taken place on that particular aircraft. Once the visual inspection is complete, the Plane Captain assists the crew with seat straps and any last-minute details before launching.

Now, it's time to start the engine(s). While the PC was helping the aircrew, the other launch team members were attaching power cables and air hoses in preparation for engine start. The pilot and PC run through the engine start-up sequence and all preflight checks, including flight controls, the in-flight refueling probe and every conceivable moving part on the exterior of the aircraft. The Plane Captain then performs a final inspection, removing landing gear safety pins, checking tires and making sure all the panels are secure. Once the final walkaround is complete, the pilot gives the PC the signal to remove the wheel chocks and begins to taxi the aircraft. The plane or helicopter rolls toward the PC. The pilot then brings the aircraft to a complete stop in order to check the brakes. A sharp hand salute is exchanged and the aircraft is sent on its way.

This procedure represents a best-case scenario. If anything goes wrong during the preflight checks, the Plane Captain alerts the appropriate trouble-shooter, who in turn attempts to rectify the situation. If the problem is too severe to repair immediately, the aircraft is shut down for maintenance.

During the flight, the Plane Captain and his crew are usually tasked with completing necessary paperwork and assisting other work centers with aircraft maintenance. When the word is given that an aircraft is "in the break" or otherwise inbound, the line crew is galvanized into action once again. As the aircraft returns to the squadron's flight line, the Plane Captain directs it into position, assists the crew in debarking and either prepares it for another flight or secures it with tie-down chains.

The rest of the line crew's day (or night) is filled with inspections, paperwork and moving aircraft. The line shop is also responsible for washing each aircraft regularly. According to Airman Thomas D. J. Fink, a Plane Captain with VA-34, pride is a key factor: "When an airplane has your name on it and it looks good both inside and out, that's something you can be proud of." An aspiring AD, Fink says he and the other VA-34 PCs enjoy a good rapport with squadron aircrews. "It's respect," says Fink. "They respect us and we respect them. Some people don't think too highly of us because we're new to the Navy or whatever, but the pilots really respect us for what we do."

The line shop's responsibilities increase when squadrons deploy aboard ship. Tie-down requirements change because of varying sea and weather conditions. It is not uncommon for a Plane Captain to single-handedly haul 18 tie-down chains, weighing nearly 10 pounds each, across a three-acre flight deck during heavy seas and high winds.

Plane Captains must also work closely with the aircraft handlers and the fuels division aboard ship. And washing aircraft takes on added significance. Airplanes and helicopters must be washed every seven days while at sea because of the increased risk of corrosion damage.

Plane Captains take responsibility beyond their experience for multimillion-dollar aircraft, they take pride in doing the best job they can, and they respect that job and the people for whom they do it. Not only that, they understand *why* they have to do it.

Responsibility, pride and respect characterize the young men and women entrusted with such arduous duty.

Airman Fink said, "I'm the one who got them going. After that salute, my job is done until they come back. When they come back, we know they're safe." ■

Courtesy Bob Lawson

XFJ-2 1933

FJ

By Hal Andrews

Under the Navy's definitive aircraft designation system prior to the Department of Defense 1962 standardization, the manufacturer's assigned letter usually had some association with the company's name. So, it was not surprising that there were always questions regarding "J" for North American Aviation (NAA) as in FJ (F-1) *Fury*, A3J (A-5) *Vigilante* and the still-in-service T2J (T-2) *Buckeye*.

Like many of Naval Aviation's stories, the answer is perfectly logical, dating back to the first XFJ-1 experimental fighter of 1930.

When the XFJ-1 contract was awarded to the Berliner-Joyce Aircraft Corporation in 1929, "B" was already taken for Boeing. Since Temple Joyce was more closely tied to Naval Aviation than his operating partner, Henry Berliner, the assignment of "J" was a reasonable choice. As the successor in 1935, NAA carried on with the "J" when the Navy bought its first NAA airplanes—NJ-1 trainers—the following year.

As the Berliner-Joyce company got under way in 1929, its largely ex-Curtiss engineering leadership had a particular interest in increased pilot visibility for all types of aircraft. This matched a similar interest for fighter pilot combat vision among the Navy's Bureau of Aeronautics (BUAER) Military Planning and Design staffs. BUAER was also interested in all-metal construction, and metal monocoque fuselages with integral fuel tanks between the engine and pilot were seen as an approach to a minimum cross-section fuselage, which reduced weight and aerodynamic drag while improving pilot vision.

In 1928 BUAER's design staff put these ideas into a biplane fighter design with the upper wing panels mounted directly to the upper fuselage in front of the pilot, giving minimum obstruction to his upward, downward and forward view. To provide adequate gap between the upper and lower wings for aerodynamic efficiency, the lower wing was carried on struts below the fuselage. This feature had been found satisfactory in the earlier BUAER-designed TS scout, produced by both Curtiss and the Naval Aircraft Factory (NAF). Overall improvements in performance were promised with the 450-hp Pratt & Whitney (P&W) Wasp engine, then standard for carrier fighters.

Negotiations between the new company and BUAER resulted in a May 1929 contract to build an XFJ-1 prototype, generally following BUAER's Design 74. As the company's growing staff tackled its development, along with three other new prototype projects, mockup inspection was completed in September. With the usual adjustments, construction and static tests proceeded.

In May 1930 the airplane rolled out of the Dundalk (Baltimore), Md., plant for ground testing. Among its special features was an underfuselage trough into which a self-retrieving arresting hook retracted. Other than its fabric-covered, wood-structure biplane wings, it represented the latest thinking in combat aircraft.

Trucked to NAS Anacostia, D.C., it first flew in June and completed its demonstration flights. Navy trials followed with disappointing performance and flight characteristics. An agreement would have returned the airplane to the plant for changes in July; however, late in June, a tail skid assembly failure upon landing resulted in the XFJ-1 being trucked back to Dundalk for repair and modification. In addition to moving the engine forward and increasing the rudder area, various drag reduction changes were incorporated, including strut clean up and a Townsend anti-drag ring cowl. Trailing edge cutouts were made in the upper wings at the fuselage to improve pilot approach and landing visibility.

The XFJ-1 was flown back to Anacostia in early November and trials resumed. Directional problems continued and the rudder balance area was cut off and replaced with an equal fin extension. After this change it went to NAS Hampton Roads, Va., in December for shipboard type trials on the platform. While the self-retrieving tailhook was lauded, the sidewalls of the retracting trough were battered; this led to a seat cushion being attached under the rear fuselage to prevent further damage. When the right rear landing gear strut failed in a January 1931 landing, the damaged airplane was barged back to the plant for repair.

XFJ-1 May 1931

XFJ-1 June 1930

By this time forward visibility for landing was considered unacceptable for carrier landings, particularly as affected by the yet-to-be-tested ring cowl. A decision was made to raise the upper wing six inches. To keep changes to a minimum, this was done by inserting a gull-type attachment for the upper panels, raising the root and retaining the interplane struts to give zero upper wing dihedral. Wheel streamlines—pants—were also provided for further drag reduction. An uprated R-1340D Wasp also replaced the previous R-1340C. Pressured by BUAER to support June fiscal year production contract decisions, B/J (as the company had become, adopting its former logo as its official name) returned the modified XFJ-1 to Anacostia in May. Considered with a Wright R-975 engine for airship use, as well as with all-metal structure wings and alternate engines for both carrier and airship fighters, the XFJ-1 had not completed its trials in June and was not selected for production. In July the XFJ-1, as currently configured, was redesignated the XFJ-2, carrier type trials were completed and the vertical tail height was increased again at the factory. Directional stability and control were still not satisfactory and the carrier landing evaluation was adverse. B/J was requested to incorporate appropriate trial board recommendations for acceptance and subsequent experimental service use. The XFJ-2 went back to Dundalk, this time without any great urgency.

While the main course of XFJ-1 testing had proceeded, an interest in the use of Musselman Air Wheels resulted in a separate contract for B/J to build a modified XFJ-1 landing gear to use these wheels. When the XFJ-2 returned to Anacostia, the air wheel landing gear was tested and considered preferable for land-based operations. It was installed when the XFJ-2 was ferried to NAS San Diego, Calif., in October 1931. The regular gear was shipped separately and reinstalled for service type trials, including carrier operations aboard *Saratoga*. These were initiated on 11 December, but the trials ended prematurely a week later. Damage from an engine fire on the ground during remote field takeoff and landing flight operations resulted in another trip back to Dundalk for repairs in January 1932. After the repairs were completed, it went to Anacostia that summer fitted with the air wheel landing gear for general utility flying to gain service experience with the integral fuel tank.

A year later it went to NAF for overhaul, after which it was assigned to NAF for continued general utility flying. In March 1934 the integral tank was thoroughly inspected and only minimum corrosion or other deterioration noted. Flying continued into 1935. In May, while undergoing power plant ground testing at NAF's Aircraft Engine Lab, engine failure led to an overall inspection, and it was retired and surveyed with over 330 airframe flight hours.

By this time its integral tank was no longer a prime BUAER interest. The two B/J fighter successors, which had featured integral fuselage fuel tanks, had already lost BUAER's interest. The XF2J-1 was stricken in May and efforts to correct the XF3J-1's engine/airframe vibration problems were finally abandoned in August. All of B/J's Navy fighters—as well as B/J itself—passed into history. A rare re-use of an aircraft designation resulted when NAA's first jet fighter was also designated XFJ-1 in 1945 rather than the successive XF4J-1.

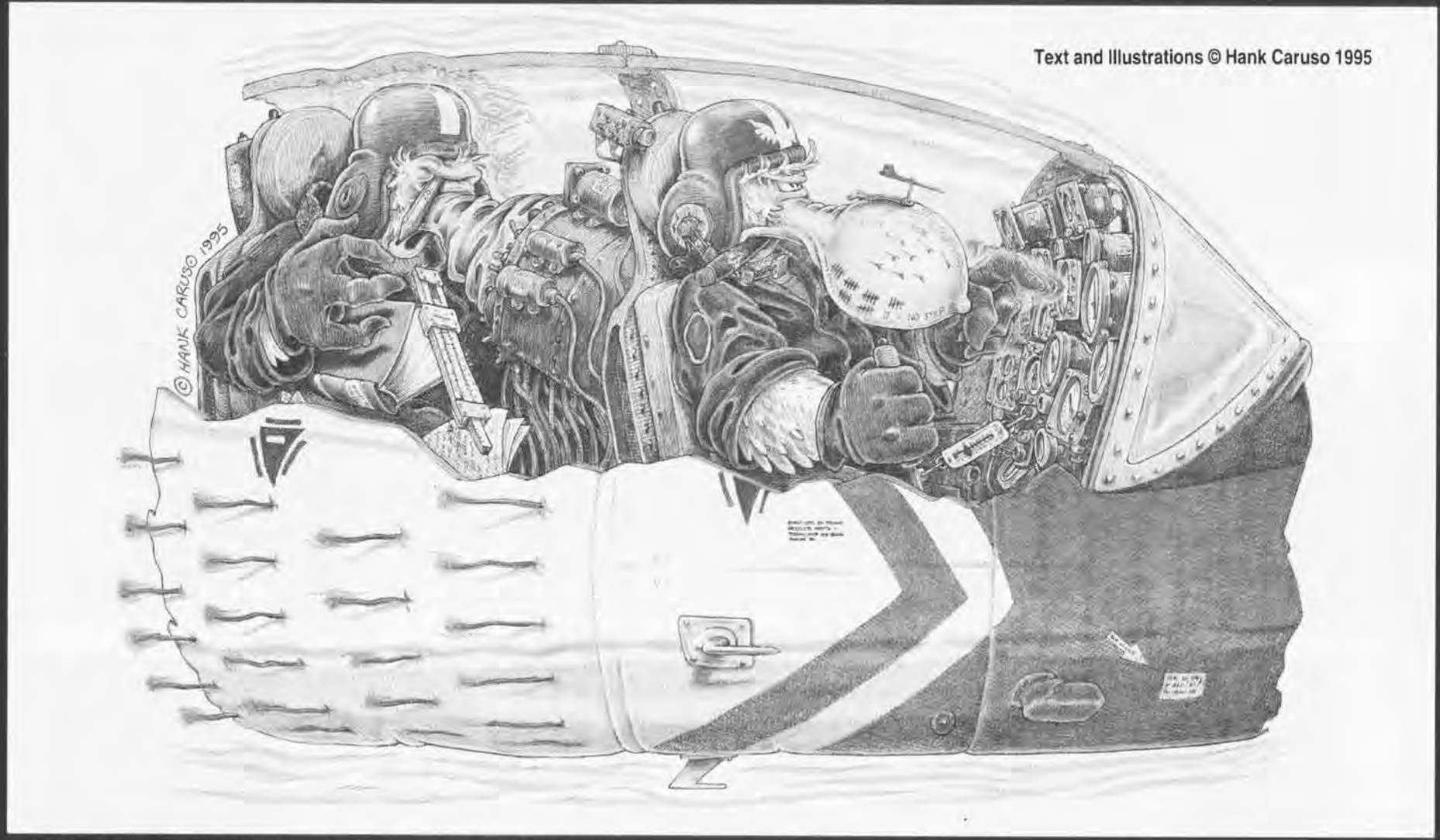
XFJ-1 November 1930

XFJ-2

Span	28'6"
Length	20'7"
Height	9'10"
Engine: P&W R-1340-D	500 hp
Maximum Speed	193 mph
Service Ceiling	24,700'
Maximum Range	726 mi.
Crew	Pilot

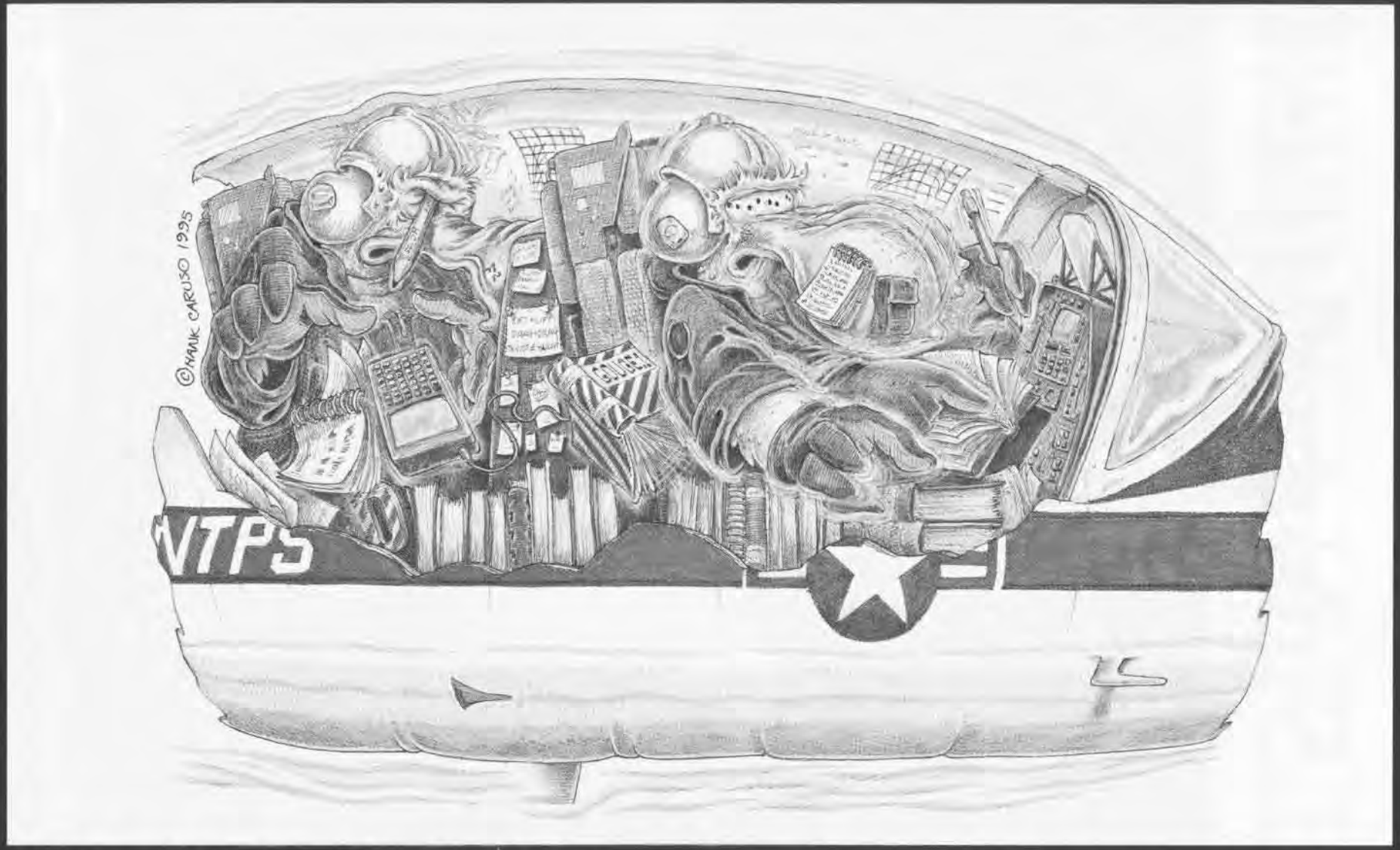
Armanent: Two .30-caliber machine guns; provisions for two 120-lb. bombs

U.S. Naval Test Pilot School—Then and Now



1945—When the first U.S. Naval Test Pilot School (USNTPS) class convened on 12 March 1945, the jet age was beginning to push the boundaries of flight to incredible extremes. New aircraft were not completely sure how they should behave in the air, ergonomics was an unknown concept and a disciplined approach to learning the art of aircraft and avionics testing was an untried theory. Early USNTPS students were often hard-charging combat veterans whose seat-of-the-pants flying habits had to be systematically "untaught." (The need to "look good" areas of red paint. Aerodynamicists refer to this phenomenon as "chroma-kinetic augmentation."

With brand-new "jet age" technology, student pilots encountered flight dynamics that weren't in the book yet. These discoveries exponentially increased the "pucker factor." In the back seat, the aircrew, or flight test engineer (introduced to the curriculum in 1965), learned to deal with cramped quarters, primitive instrumentation and unexpected moves from the front seat. Helmet marks on tight-fitting canopies documented the



1995—Today, the hallmark of the U.S. Naval Test Pilot School is a highly disciplined approach to teaching flight testing. The cockpit is a flying classroom. The lessons are the measurements and sensations that flood each student's mind and notebook. Students don't always control aircraft directly; instead, computers translate the students' inputs into appropriate flight behavior. At the same time, the average age of the test pilot school student has dropped considerably, while the academic atmosphere at USNTPS has grown much more intense. Academic correctness prevails.

Of course, this increased academic focus flourishes because of the innumerable lessons learned from previous generations of USNTPS graduates, who devoted their professional efforts to removing the uncertainty and unwarranted risk from test flying. Many of these lessons have been written in blood. "Religious experiences" in the cockpit are still a fact of life, but the balance at USNTPS has distinctly shifted toward systematically rediscovering the known rather than being compromised by the unknown.

Special thanks to Cdr. John Keilty, CO, U.S. Naval Test Pilot School, and to USNTPS Class 107.

U.S. Naval Test

A TF/A-18 Hornet, the newest airplane in the U.S. Naval Test Pilot School inventory, makes a pass over the school ramp and hangar area accompanied by a Russian MiG-21U, which is occasionally contracted to the school for training purposes.

Pilot School

50 Years of Pushing the Envelope

By Jim Jenkins

Fifty years have passed since a school, remotely resembling the U.S. Naval Test Pilot School (USNTPS) of today, began training Naval Aviators to perform duties as pilots for flight tests and trials of naval aircraft. At this year's reunion in April, alumni celebrated the school's golden anniversary.

It all began in 1945 sometime after the Flight Test Group located in Anacostia, D.C., had transferred to the newly established Naval Air Station, Patuxent River, Md. Commander Thomas F. Connolly, assistant flight test officer at the Naval Air Test Center (NATC) aboard the air station, expressed concern to his chief project engineer, Commander Sydney Sherby, that test pilots were unfamiliar with testing techniques. Cdr. Connolly declared that if flight testing was to continue to perform its mission effectively and keep pace with progress in aeronautics, some formal program of education for test pilots and engineers was essential. Sherby agreed and the two took their idea to Commander C. E. Giese, flight test officer. Giese, recognizing the importance of such training, appointed Sherby to head a committee of three officers to study the matter and report back to him with recommendations.

Sherby proposed that an indoctrination course for Navy flight test pilots would be ready for review on 1 March. The curriculum was to cover the fundamentals of aerodynamics, procedures for aircraft performance testing, evaluation of aircraft stability and control characteristics, miscellaneous tests and trials, actual in-flight performance testing and flight test reporting in a standardized format. The curriculum was scheduled to fit into 37 hours of classroom work with 9 hours of flight time spread over 10 weeks. Classes were to meet Monday, Wednesday and Friday mornings.

Giese approved Sherby's recommendations and appointed him officer in charge of the Flight Test Pilots' Training Program. Sherby provided the classroom instruction while Lieutenant H. E. McNeely served as flight instructor.

Several members of the USNTPS faculty and staff take a break from the academic and flight program for some down-to-earth training.

The first aircraft used for training were the F6F, FM-2, SBD, TBM and SNJ, which were borrowed from Flight Test.

The first class, later designated Class Oa, consisted of 14 pilots and engineers; it convened 12 March 1945 and graduated 30 May. NATC Commander Captain A. P. Storrs gave each student a diploma and a slide rule for completing the course.

Class Ob convened in October, but the enrollment was diversified. The class included students from other NATC activities. The chief flight instructor for this class was Lieutenant Najeeb E. Halaby, who later became administrator for the Federal Aviation Administration and then president of Pan American World Airways. Class Ob graduated in February 1946.

In March 1946 newly appointed NATC Commander Captain J. D. Barner wrote to the Chief of the Bureau of Aeronautics (BUAER) explaining the need for a formal test pilot school and requested that one be established as a division of the test center. Barner recommended semiannual classes of about 30 students and suggested that the class last for four to five months instead of just a little over two months. BUAER Chief Rear Admiral H. B. Sallada replied that the school would be a great benefit to Naval Aviation and would fulfill a long-standing need. Sallada gave Barner authorization to proceed with the plans, adding that it would be a tremendous asset to the Navy to invite experienced test pilots from aircraft manufacturers to lecture at the school and maybe for some contractors' test pilots to attend as students. However, progress was slow due to postwar shortages of personnel and space. In a letter to BUAER, Barner wrote that curriculum development would continue but positive action would be deferred until the space and personnel situation improved.

About the time Class Oc was in school, late in 1946, Captain Frederick M. Trapnell, the man for which the airfield at Patuxent River is named, was ordered there as NATC commander. Trapnell previously served as flight test officer when the Flight Test Group was still in Anacostia. Trapnell's love of and interest in test flying proved invaluable to the development of a formal naval test pilot school. Not long after his appointment as NATC commander, one could find him sitting in on Sherby's classes listening to what was being taught. Trapnell was impressed by Sherby, but it became clear to him that the training program was inadequate to meet the requirements of even flight testing alone.

Sid Sherby (third from left), the U.S. Naval Test Pilot School's first director, was on hand during the spring of 1993 for the dedication of the current academic building.

Bill Oosterink

The U.S. Naval Test Pilot School, NAS Patuxent River, Md., is the only test pilot school in the U.S. military to offer a rotary wing aircraft course in its curriculum.

A USNTPS student under instruction debarks from the cockpit of a T-38 Talon after completing a project flight.

Trapnell wrote to the Chief of Naval Operations (CNO) via BUAER on 1 May, explaining the seriousness of the situation. In that letter, Trapnell requested immediate authorization and funding to establish a full-time course of about 30 students in classes convening every nine months. Trapnell's suggestions came from the detailed recommendations submitted by Giese. The estimated cost for the school's first year was set at $25,000. CNO agreed to the request and Trapnell began drafting a final blueprint for the school. Trapnell submitted the final draft to CNO on 20 October 1947.

At the time, Sherby was teaching Class Od, which graduated in early December and consisted of civilian engineers and students from all five of the NATC activities.

On 22 January 1948, Trapnell's plan for a formal test pilot school as a division of NATC was approved by Admiral J. D. Price, Deputy Chief of Naval Operations. In accordance with the accepted plan, Sherby was relieved of his duties as chief project engineer, Flight Test Division, to assume the duties as Director of the Test Pilot Division. One of Sherby's recent graduates, Lieutenant Commander Emil P. Schuld, received orders to be the Assistant Director and Chief Flight Instructor of the division. Trapnell had collected a library of about 550 technical books and an assorted arrangement of used desks to start the Test Pilot Training Division. Seven aircraft also had been acquired for training purposes. The inventory included a PB4Y-2, F6F-5, XNQ-1, F7F-3, F8F-1, PBY-6A and an SNB-1.

Class Oe was still in session when the Test Pilot Training Division's first class began on 6 July 1948. Test pilot training would never be the same. Sherby stayed as director long enough to see Class 1 graduate on 21 December 1948. Sherby's collaborating partner, Connolly, became Director of the Test Pilot Training Division, but before Sherby departed for his new assignment at the Pentagon, he and Connolly teamed up to compile the division's lectures and concepts into the definitive textbook *Airplane Aerodynamics.* The textbook continued to make a huge impact on test pilot training throughout the years, and students may still read a foreword by Trapnell, which was included in the book as a fitting reminder of an individual whose wisdom and perseverance played a significant role in the establishment of formal test pilot training at Patuxent River.

In the last 47 years, the formal school for test pilots has grown and changed significantly. In 1957 the name was changed to the United States Naval Test Pilot School.

The courses are continuously revised to accommodate new technology that produces faster and more sophisticated aircraft. "Years ago, the naval aviator or naval test pilot was not as well prepared and not as well regimented at testing techniques as we are today," said Head of Academics Dr. Bob Richards. "I think we have better programs to make it happen right." Richards added that over the years course instruction has become more complex to reflect the changing technology, and the graduates have become smarter in the techniques of test and evaluation.

Students do not realize the workload they are going to face when they first get to USNTPS. Lieutenant Ron Higgs (Class 107) admitted, "It's more intense than I thought." He emphasized that report writing is the most challenging. The students are required to write anywhere from 30 to 70 pages describing, in detail, characteristics of certain aircraft and/or aircraft systems.

The curriculum has expanded to accommodate three different criteria: fixed wing, rotary wing and airborne systems. USNTPS is the only test pilot school in the U.S. military that offers academic courses on rotary wing aircraft. In addition to having four to five foreign students in class annually, USNTPS teaches all Army and Marine pilots and has an exchange program with the Air Force. Roughly one-sixth of each class is occupied by nonmilitary students, such as civilian engineers.

The diversity of students who attend the school allows everyone to gain experience and knowledge from each other. "Working with everybody with different backgrounds is very enlightening," said Royal Air Force Squadron Leader Craig Penrice. Penrice is an exchange student from Britain whose favorite part about being a USNTPS student is the opportunity to fly different aircraft. Many students share this feeling. Before coming to the test pilot school, Penrice spent some time with the U.S. Air Force flying F-15s; in Britain he flew the *Lightning* fighter and was an instructor on *Hawk* aircraft. After his graduation from Class 107 in June, Penrice will return to England to test the newly developed *Eurofighter*, a state-of-the-art, single-seat fighter built jointly by Britain, Spain, Italy and Germany. According to Penrice, the most challenging thing about being a USNTPS student is "the sheer volume of work."

So much new technology enveloped the curriculum that class length was expanded to the current 11 months. Without a permanent structure to call its own, the school was forced to move several times until the present academic building was built in 1993. Current Director of USNTPS and one-time student Commander John P. Keilty said, "Moving into the schoolhouse here certainly helped our educational climate, especially after spending so many years in hangars and in disjointed buildings. But the thing to remember is that the people are the school—not the airplanes, not the building, the people."

Throughout the years the United States Naval Test Pilot School has trained some of the best known aviators in history. One of Lt. Higgs's reasons for wanting to come to the school was to pursue his goal of becoming an astronaut. "It feels good to be a part of a great institution and to have my name associated with names like John Glenn and Alan Shepard," he said. These are just two of the many elite aviators who have trained at USNTPS.

Today, the Navy continues its tradition of training some of the world's finest test pilots. "The test pilot, test Naval Flight Officer and test engineer come out of here with a discipline, an awareness," Keilty said, "so that when they go to their test squadrons or organizations they have the discipline and background to make educated, methodical decisions in the performance of their duties as project officers."

USNTPS training gives aviators the skills they need to push the envelope—not only in flight but throughout their careers. ■

Mr. Jenkins is a writer for *The Tester*, Public Affairs Office, NAS Patuxent River, Md.

Tactical Aircraft Mission Planning System

Photos courtesy TELOS/Kelly Multi-media

Windows on the Future

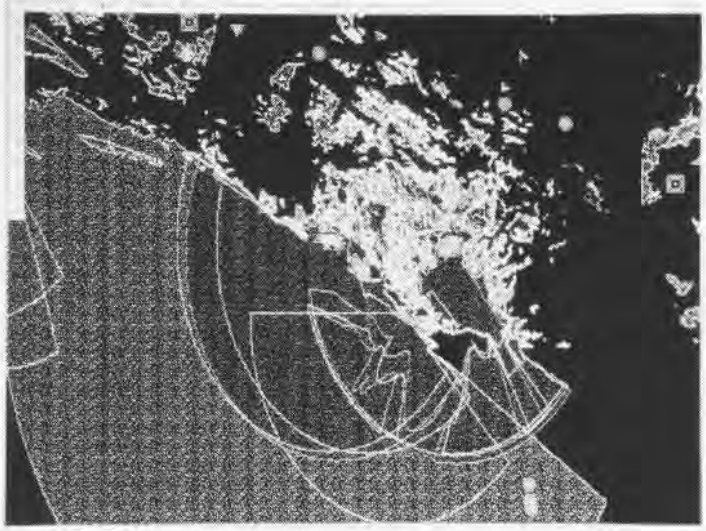
Computer-assisted mission planning has been available to much of Naval Aviation since the advent of the Tactical Aircraft Mission Planning System (TAMPS) in the late 1980s. However, like the early personal computers, the Man-Machine Interface (MMI) was not optimized for ease of use. Personal computers have migrated towards the ever-popular Windows™ operating environment increasing the ability of the layman to use, if not master, their operation.

TAMPS was designed to be a great boon to mission planners by shortening mission planning time by eliminating the manual calculation of fuels and the cut-and-paste method of using paper charts for mission routing. At first, TAMPS was difficult to learn and, in most cases, yielded only a few individuals per squadron who could afford the time to become proficient in its use. Likewise, the large size of host hardware meant that only a few units were available for the air wing, limiting access. TAMPS became a valuable tool for mission planning, but even during Operations Desert Shield/Desert Storm, it remained only an alternative to traditional cut-and-paste mission planning. The significantly improved 6.0 version overcomes the obstacles.

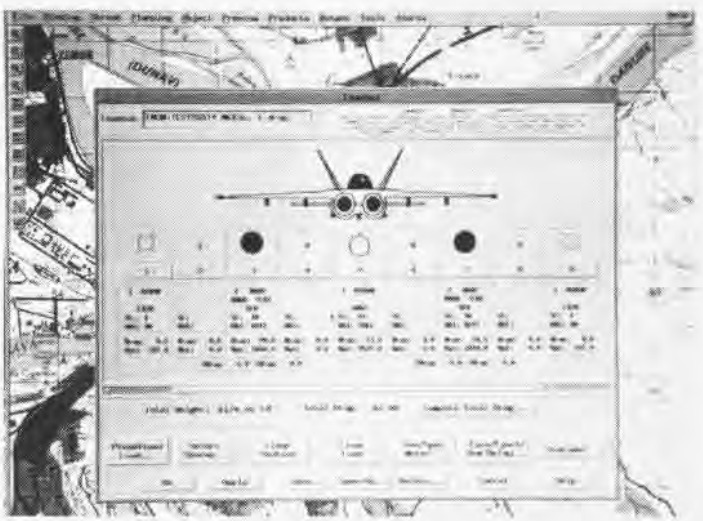
TAMPS 6.0 incorporates lessons learned from prior versions, recommendations from the operational test and evaluation community and recently identified requirements which support the emerging generation of avionics and weapons that require mission data loads. The resultant software incorporates an MMI that is very familiar to those acquainted with the Windows™ environment of the latest personal computers. For aircrews at sea, TAMPS 6.0 will be available in the ready room, hosted on easily portable laptop computers linked to a master server located in the carrier intelligence center.

A new feature of TAMPS 6.0 will be the ability to use intelligence, weather and geodesy data bases that are automatically updated over the computer network. Aircrews will be able to access these data bases, which are critical to mission planning, and extract data as desired without leaving the ready room. For strike planning, mission routing data will be able to be shared over the network between ready rooms. The portability provides Marine aviators with the same features and ability to plan interactively and receive data base updates even when based at remote locations. This feature was demonstrated by the 3d Marine Aircraft Wing during the Air Force-sponsored Exercise Blue Flag 95-2 at Hurlbert Field, Fla.

TAMPS 6.0 heralds the shift of computer-aided mission planning systems from being a "nice-to-have" tool that only a few can use to a "must-have" tool that literally becomes the "keys to the aircraft," which everyone must be able to use. This stems from the host of latest generation avionics and weapons that will not function without upload of mission data, which is generated on TAMPS and transferred to the aircraft via a Memory Data Loader (MDL). For example, ARC-210 radios, use of the Global Positioning System/Inertial Navigation System and/or the Joint Tactical Information Distribution System, Joint Direct Attack Munition (JDAM) and Joint Stand-Off Weapon (JSOW) all require mission data uploads. For weapons such as JDAM and JSOW, TAMPS will have targeting data, including imagery usually obtained in the carrier intelligence center through cumbersome methods. A typical data



Opposite page, LCdr. Eric Disher, an A-6 pilot serving as the TAMPS 6.0 testing and integration operator, demonstrates TAMPS 6.0 on a TELOS ACE/VME portable computer similar to the final configuration that will equip Naval Aviation ready rooms. Left, a significant feature of TAMPS 6.0 is the ability to connect to intelligence data base information that is automatically updated. Depicted here is an overhead view with threat rings from radars. Aviators use this in planning their routes to minimize exposure to these threats. Below left, a TAMPS 6.0 computer display of mission routing overlaid on imagery. TAMPS 6.0 will have on-line current Defense Mapping Agency charts and be able to access available imagery over the local area network from a digital imagery work station. Below, TAMPS 6.0 uses an enhanced windows-type Man-Machine Interface, as shown here in the F/A-18 loadout configuration display, which allows rapid calculation of aircraft weight and balance. Once accomplished, the software then accurately models the aircraft.



load for JDAM generated in about 20 minutes on TAMPS 6.0 would necessitate hours of data research from many sources and over 2,000 manual keystrokes in the cockpit.

As these aircraft systems enter service with the fleet, TAMPS 6.0 will have to be in place to enable their use. Weapons now in service with cumbersome data loading equipment, such as the High-Speed Anti-Radiation Missile (HARM) and Standoff Land Attack Missile (SLAM), will have Mission Planning Modules (MPMs) and will allow data loads to be carried to the aircraft via an MDL. Since every aircraft planned to be in service past 2000 will have one or more of these aircraft systems, TAMPS will become very familiar to every tactical aircrew member.

TAMPS 6.0 is composed of a common core (which embodies the MMI and functionality common to all aircraft and systems that it supports) and MPMs that contain the individual characteristics and utility associated with each system. The TAMPS program office in the Naval Air Systems Command, PMA-233, is responsible for development of the core software, and the respective program office for each system supported by TAMPS is responsible for the MPM. Naval Air Warfare Center Weapons Division, Point Mugu, Calif., oversees the core development tasks and integration of the MPMs. In all cases, existing software is used wherever possible. In fact, TAMPS 6.0 capitalizes on software already developed for the Tactical Electronic Reconnaissance Processing and Evaluation System. An Interservice Mission Planning Working Group has been formed with participation by all the services to identify areas of collaboration and maximize commonality. The Navy has demonstrated the ability to exchange mission routes with the Air Force and plans future functionality along those lines so that joint mission planning can occur. (Like the Navy, the Air Force has selected a common mission planning system for its aircraft—the Air Force Mission Support System.)

The genesis of TAMPS dates back to the tenure of John Lehman as Secretary of the Navy. After the loss of two Navy aircraft during a one-time strike against targets in Lebanon, it was revealed that aircrews had been given scant time to plan. The sobering loss of aircraft in a medium-threat environment, as well as one pilot killed, a bombadier navigator captured and dubious strike results, led to a sweeping reform of strike planning. The creation of the Naval Strike Warfare Center at Naval Air Station, Fallon, Nev., was one of the results. The multilayered

command and control structure was the principal cause of the delay that gave aircrews inadequate time to plan; however, the technology afforded by the computer presented the opportunity to give aircrews a computer-based mission planning system to make the most of whatever time was available. In 1987 Lehman directed that TAMPS be adopted as the Navy's standardized mission planning system. TAMPS 6.0 realizes that vision as other mission planning systems are presently incorporated via MPM, or will be in the near future as TAMPS 6.0 hardware and software become available.

Aircraft development schedules are already closely tied to TAMPS. In particular, the F/A-18 *Hornet* and TAMPS have aligned their respective software schedules to be mutually supportive. TAMPS 6.0 is the enabling system that will bring a HARM mission planning capability to the ready room, followed by SLAM and JSOW. For the *Hornet*, TAMPS provides an enhanced windows-type MMI feature that precisely models the aircraft weight/drag for fuel and endurance data in mission routing development.

TAMPS 6.0 is currently in the fleet at several test sites, such as the Naval Strike Warfare Center and throughout the 3d Marine Aircraft Wing. Upon successful completion of operational test and evaluation, it is expected to enter fleet service this year. Look for it at a ready room near you soon! ■

TAMPS 6.0 Significant Features

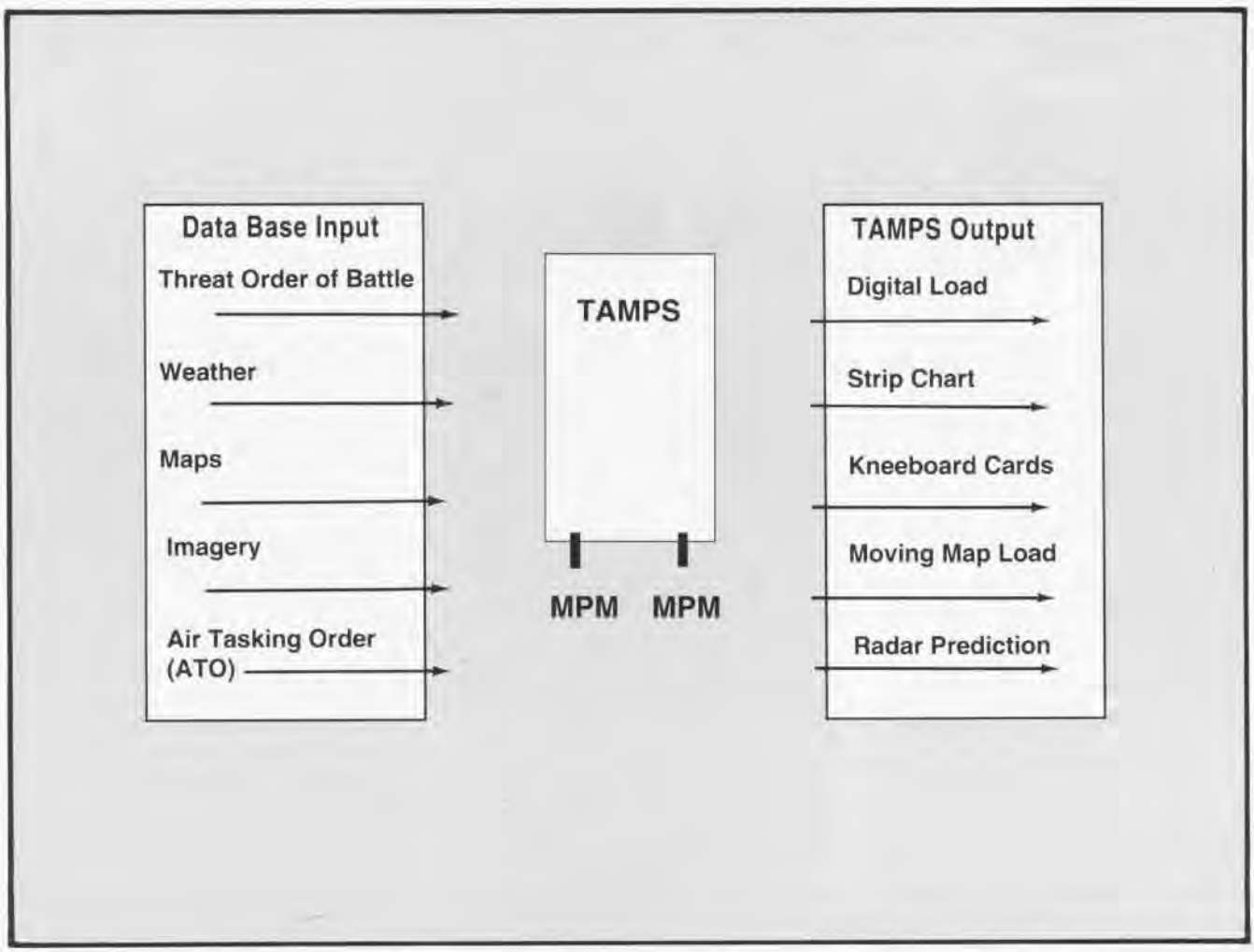
User-Friendly Man-Machine Interface (MMI)

One Stop Mission Planning

Fused, Correlated, Real-Time Intelligence with Automatic Updates

Mapping, Charting, Geodesy and Imagery (MCG&I) Databases

Generation of Digital Mission Data Loads for Advanced Weapons and Avionics



ANA Bimonthly Photo Competition

The bimonthly ANA photo competition produced joint winners: Above, Marine Capt. Ian K. Walsh, HMM-263, captured an HMM-162 CH-46E at the peak of le Grand Margés Mountain located on Camp de Canjuers, France, in November 1993. Right, LCdr. Brian G. Gawne, VF-32, shot F-14 *Tomcat* "Gypsy 212" on a twilight combat air patrol mission over Bosnia-Herzegovina during Operation Deny Flight. Deployed aboard *Eisenhower* (CVN 69), the squadron was enforcing the no-fly zone in support of UN sanctions.

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 Avaition Photo Contest, 5205 Leesburg Pike, Suite 200, Falls Church, VA 22041-3863.

Technical Developments in World War II

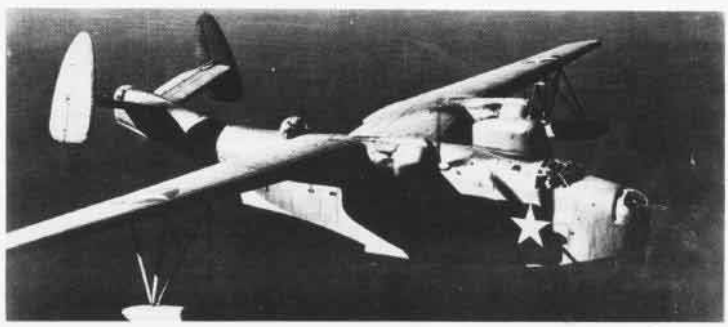
By Lee M. Pearson

WW II technical developments involving combat aircraft, powerplants, the vital new areas of radar and antisubmarine warfare (ASW) and the substantial efforts with helicopters and guided missiles were discussed in *Naval Aviation News*, November–December 1990 through March–April 1991. This article deals with munitions and catapult developments.

Within the Navy Department, the Bureau of Aeronautics (BUAER) was responsible for aircraft and the Bureau of Ordnance (BUORD) for ordnance. The general lines were clear but the details involved in properly fitting bombs and guns in naval aircraft required understanding and accommodation. Thus, the officer with aeronautical responsibilities for the Coordinator of Research and Development told me that his greatest achievement was to introduce the man in BUAER responsible for putting guns in airplanes to the man in BUORD responsible for getting the gun. (The files indicate that he spent much more time trying to coordinate disparate projects involving highly classified guided missiles and rockets.)

A 1941 Army-Navy agreement assigned cross-service responsibilities: Army Ordnance developed and procured most aircraft guns and general purpose and semiarmor-piercing bombs; BUORD similarly handled armor-piercing and antisubmarine bombs, i.e., depth charges. In nomenclature, the letter "M" indicated equipment was Army developed and

A TBF Avenger on its way to bomb Tinian and support landing operations during the second day of the invasion. Note the turret and the tunnel on the aft fuselage.
USN 247982



The Navy initially experimented with gun turrets on several types of aircraft, including patrol planes such as this PBM Mariner. Turrets were removed from early production Mariners because of weight problems, but installed in all later models.

Consolidated Catalina flying boats stand on the field at the American advance base, Amchitka, Aleutian Islands, awaiting the call of duty. In the foreground bombs are brought to the field prior to loading on the Catalinas. NH 98483

"Mk," or Mark, indicated it was Navy developed. The prefix "AN" meant that the gear had been tested and approved (standardized) by both services. The frequency of this prefix indicated a seldom-noted but highly successful example of interservice cooperation in areas of massive production and use.

Guns

After WW I, .30-caliber machine guns were generally mounted in naval aircraft for both offensive and defensive missions. Heavier but more powerful .50-caliber guns were adopted in 1935 for installation in new naval aircraft; by the end of 1941, most operational aircraft were equipped with .50s. Two larger guns were being developed in 1939, a .60-caliber adaptation of the German 20mm Mauser and a 20mm Hispano Suiza, a French design.

During the war, improvements to the .50 caliber continued. In the decade 1935 to 1945 firing rate doubled from 600 to 1,200 rounds per minute; at the same time, muzzle velocity and magazine capacity were increased. Remote charging mechanisms—hydraulic, pneumatic and electric—and remote electric triggers were developed, which increased the flexibility in mounting guns and permitted underwing mounts and gun packages in lieu of bombs. A new "Stellite" gun barrel, developed by the National Defense Research Committee (NDRC), greatly improved barrel life.

Development of the .60-caliber gun continued while the 20mm was placed in service; the F4U-1C fighters were fitted with four 20mm guns in lieu of six .50-caliber guns in other *Corsairs* and in F6F *Hellcats*. The SB2C *Helldiver* dive-bomber, in most models, was equipped with two 20mm guns. The twin-engine F7F *Tigercat*, being readied for service at the end of the war, was fitted with a mixed battery of four .50-caliber and four 20mm guns.

Turrets

By the late thirties larger guns, multiple gun installations and higher aircraft speeds made the aiming of flexible guns difficult and led to power-driven gun turrets. The Navy's first aircraft gun turret project began in June 1937 as part of the XPBM-1 patrol plane development. The first turret-equipped aircraft to be operated by the Navy, however, was the PBO *Hudson* patrol plane built for the British by Lockheed and obtained in the fall of 1941 for ASW patrol from northern bases during the coming winter. The PBO turret contained twin .30-caliber guns.

Following the XPBM-1, all new dive-bomber, torpedo plane and patrol plane developments included turrets; a turret was developed with the XTBF-1 *Avenger*, and combat *Avenger*s used turrets throughout the war. A similarly developed turret for the SB2C was installed in early production aircraft but was removed during the *Helldiver*'s prolonged teething period.

The first Navy-developed turrets were fitted with a single .50-caliber gun, but later models contained twin or quad mounts while 20mm turrets were under development. Gyro-stabilized, lead-computing sights were going into production at the end of the war and radar-controlled turrets were under development. Efforts to develop a light-weight, high-performance drive failed because of production problems, as did efforts towards a standardized turret intended for various positions on different aircraft.

Operational patrol planes were fitted with turrets, although when early PBM *Mariner*s were found to be underpowered, the turret was one of the items removed in a weight-reduction program.

Turrets were developed for many new aircraft that never went beyond experimental status. As one example, remote-controlled upper and lower turrets developed for the Douglas XSB2D-1 dive-domber preceded similar turrets installed in the Army's Douglas A-26 *Invader*. Gun turrets continued to be of interest in aircraft development for a few years after the end of the war, but a variety of tactical, technical and strategic factors led to their abandonment.

Armor

Aircraft armor was of little interest in the interwar years as its weight would have penalized aircraft performance. In 1938, as war shadows darkened, BUAER began studying armor for aircraft pilots and the next year specified that new experimental aircraft contain space and weight provisions for armored seats or bulkheads. Basic investigation was also conducted into the effectiveness of various steel and aluminum alloys. In mid-1940 BUAER ordered armor that could protect against .50-caliber bullets fired from 200 yards. About the same time, it requested that airframe contractors design armor installations for various service, production and experimental aircraft, and in 1941 contractors were made responsible for armor procurement and installation. By the end of 1941 armor ordered by BUAER had been received and new aircraft were delivered with armor already installed. The timing was fortuitous as we entered the war with most aircraft equipped with armor. The importance of armor was noted by Pacific Fleet analysts, who considered it a significant factor in the favorable survival rate of our fighters at Midway.

The main parameters laid out from 1938 to 1941 did not change during the war. Concern for performance led to some relaxation of requirements from early 1942 into 1944, but a re-defined .50-caliber protection standard was adopted by February 1944.

Efforts to improve protection included continual study of various compositions of homogenous and case-hardened armor. Tests of laminated nylon in May 1941 were so promising that three years were devoted to an unsuccessful effort to substitute transparent plastic for bullet-resistant glass. Flak suit, helmet and fuselage curtain investigations began in 1943 and led to production orders in March 1945—too late for large-scale wartime use.

Rockets and their development became paramount for the U.S. and its allies during WW II. Here, an F-4U Corsair launches a trio of rockets during testing at the Naval Ordnance Test Station, Inyokern, Calif.

Rockets

WW II brought about a resurgence in the use of rockets. The major European combatants all had extensive rocket programs, and the long-range German V-2 was the most spectacular of many weapons. The Russians, in 1941, strafed invading German troops with airborne rockets. In America interwar rocket development was in the hands of a few dedicated individuals, most notably Dr. Robert H. Goddard. Total U.S. production of military rockets zoomed from zero in 1940 to a billion rounds per year by 1945.

American military rocket programs began in mid-1940 at the behest of NDRC. BUORD agreed that rocket propulsion could increase the penetration of large armor-piercing bombs. Thus, an NDRC rocket program commenced at Naval Proving Grounds, Dahlgren, Va., but was soon relocated to Naval Powder Factory, Indian Head, Md. In mid-1941 the NDRC rocket program was expanded and realigned: the East Coast effort was relocated to George Washington University, Washington, D.C.; the West Coast effort was begun by the California Institute of Technology (CIT), which did the most work of naval interest.

USN 269073

Ordnancemen load rockets on a TBF Avenger on the flight deck of the escort carrier Core .

USN 49319

Initial tests were carried out at Salton Sea and some of the dry lakes in the Mohave Desert; the first airborne tests were at Goldstone Lake. In the fall of 1943 Navy tests were concentrated in the China Lake area, and in November Naval Ordnance Test Station (NOTS), Inyokern (forerunner of today's Naval Air Warfare Center Weapons Division), was established.

The first U.S. Navy rocket grew out of a 7.2-inch British antisubmarine projectile, Hedgehog, which could be fired by destroyers or larger ships. The U.S. Navy used the same warhead but converted it to a rocket, Mousetrap, which being recoilless could be used by smaller vessels. CIT also redesigned the warhead to increase explosive load and improve range.

The Navy's first airborne rocket was adapted from Mousetrap. Magnetic Airborne Detector (MAD) gear enabled a low-flying airplane to detect a submarine directly under it. A vertical fall weapon, needed to utilize that information, was obtained by increasing Mousetrap's propulsive charge so that when it was fired astern by an airplane, it would (hopefully) drop vertically onto the submarine. The first airborne firing was at Goldstone Lake on 3 July 1942. Development continued for a year and retrorockets were procured for service in late 1943 for issue to MAD-equipped squadrons.

Successes of British and Russian airborne rockets led the Navy to begin development of forward-firing aircraft rockets in June 1943. Expected advantages included greater range, accuracy and velocity than bombs; greater striking power than machine guns; and less weight than heavy guns. CIT, BUORD and Commander Fleet Air, West Coast, cooperated. The first experimental firing on 14 July at Goldstone Lake came just five weeks after the go-ahead.

In a little more than two years, five different aircraft rockets were developed and factories and loading plants were erected or converted so that in July 1945 nearly 530,000 aircraft rockets were manufactured. To achieve this, CIT and NOTS began initial production of a model before development was complete, providing for testing and early operational use while obtaining the configuration needed for mass production.

Every feasible shortcut was taken. Therefore, the first rocket, the 3.5-inch Aircraft Rocket (AR) was adapted from a British ASW rocket. It had a 3.25-inch motor but its 3.5-inch head was redesigned to double underwater travel; an explosive head was also developed for use against surface targets. The second, a 5-inch AR, was obtained by attaching a refuzed 5-inch gun projectile to the same 3.25-inch motor. Thereby, an airplane was literally given the punch of a destroyer salvo. A third rocket used a newly developed 5-inch motor attached to the 5-inch warhead, restoring range and speed. This round, the High Velocity Aircraft Rocket, or more popularly "Holy Moses," was air delivered to Europe and first used in July 1944 by the Army in the St. Lo area of France prior to the breakout from Normandy.

The fourth rocket, Tiny Tim, involved an 11.75-inch motor for the 500-pound, semiarmor-piercing bomb providing a round slightly heavier than a 1,000-pound bomb. Combat introduction by the carrier *Franklin* at Okinawa failed because a Kamikaze devastated the ship before it made a Tiny Tim strike. Hence, Tiny Tim's WW II use was very limited. The fifth rocket was SCAR, a 2.25-inch Subcaliber Aircraft Rocket used for training. Manufacturing began in January 1945 and by July accounted for about half of the Navy's aircraft rocket production.

The first aircraft rocket launcher was a British type ordered in August 1943 for 200 TBF/TBM *Avenger* torpedo planes. Being slotted aluminum rails about 90 inches long, they lowered aircraft performance, particularly in multiple installations. Tests, in which the rails were progressively shortened, showed no loss of accuracy; launch stability and accuracy were provided by 200 knots airspeed. The rails were replaced by two posts, which released the rocket after less than an inch of travel. These "zero-length" mounts went into production in May 1945.

The aircraft rockets used fixed fins for stability, but some effort went into

pop-up fins and spin-stabilized rockets. Such rounds could be stowed much more densely than fin-stabilized rounds. Launchers were also developed. One was similar to a revolver in that the rounds were stored in a rotating carriage and fired sequentially. Another, developed by Douglas Aircraft as part of the XBT2D/AD *Skyraider*, stored rounds inside the wing and moved them horizontally into firing position.

Fire Control

Accurate fire-control instruments and trained crews made ships' gunfire very accurate. Limits on space, weight, time and crew necessitated simple solutions to airborne fire-control problems, primarily simple sights enhanced by a seaman's eye and doctrine based on past experience. Precise instruments, while theoretically possible, were not practical. For example, the highly accurate Norden bombsight, developed by BUORD in the twenties and early thirties, required a stabilized run of several seconds and had to be used at high altitudes to minimize exposure to antiaircraft fire. In consequence, ships avoided falling bombs by maneuvering. Of the over 40,000 bombsights produced, most were used by the Army. Of the nearly 6,500 kept by the Navy, only the stabilized bombing approach equipment was generally used; it made an excellent automatic pilot.

Despite considerable development effort bomb, torpedo and rocket fire control relied heavily upon sights for fixed guns with varying doctrinal procedures for the different weapons. The major exception was a toss bombing sight, Bomb Director Mark 1, which utilized speed, dive angle and altitude to compute the release point.

Through the 1930s ring and post sights, similar to those on a hunting rifle, were used to aim fixed guns. Aside from requiring the pilot's concentration at the expense of other tasks, their major drawback was in giving no estimate of lead. In 1937 BUORD began development of lead-computing sights incorporating gyroscopic stabilization and control. The first models were unsatisfactory and two other types of gunsights were undertaken in 1941. A telescopic sight unacceptably narrowed the user's vision. Illuminated sights were also designed. In these, the image of a bore-sighted lens was reflected onto a glass plate within the user's normal field of vision. A Navy design and a modified British design were developed. The Mk 8 illuminated sight for fixed guns and the Mk 9 for flexible guns were developed, produced and placed in service early in the war, filling a vital need in aviation ordnance.

Development of the more complex, but potentially more useful, lead-computing sight continued. The Mk 18 for use with flexible guns was in fairly wide use by the end of the war. The result, as the BUORD historians reported, was that "firepower of aircraft turret guns went up, ammunition expenditures dropped." A similar sight for fixed guns entered service in 1945 but had not found widespread acceptance by war's end.

Catapults

Many factors led to increased use of carrier catapults. Most wartime changes increased weight and, even with more powerful engines, lengthened takeoff run. Takeoffs were affected by the carrier's deck length and speed. As the war progressed, aircraft strikes became larger, which shortened the deck length available for the first planes off. Both the light carrier (CVL) and the escort carrier (CVE) had short flight decks, and the CVE had only about half the speed of a fast carrier. Therefore, as the war progressed, catapulting became more important.

Before WW II, carrier catapults were used for limited experimental purposes. This was despite the fact that from the earliest days of Naval Aviation, catapults were viewed as a means of operating aircraft from ships. During the interwar years, catapults were installed on battleships and cruisers and quickly became essential for their aircraft operations. Based on 1940 tests, plans were even made to install catapults on some new destroyers.

The Navy's first carrier, *Langley*, commissioned in 1923, had bow and stern catapults for launching seaplanes. In the spring of 1925 a landplane was catapulted from the ship, but no follow-up appears to have been made. In fact, her catapults were removed in mid-1928 because they had not been used for three years. Despite that, flywheel catapults for launching seaplanes were installed on the Navy's next carriers, *Lexington* and *Saratoga*. Two powder catapults planned for athwartships mounting on the hangar deck of *Ranger* (the first U.S. ship designed as a carrier) were eliminated to save money. A 1934 proposal to install the first experimental flush-deck catapult on *Ranger*'s flight deck was overridden on the grounds that catapults belonged on the hangar deck. *Ranger* finally received catapults in 1944.

In mid-1931 the Navy began design of flush-deck catapults (both powder and compressed air) that could be installed on the hangar deck to launch

Another major development during WW II was the catapult. Heavier, more powerful aircraft created the need for a more reliable launching mechanism. Below, an F6F Hellcat prepares to catapult off Lexington.

50 Years Ago – WW II

1 May: CVBG-74, the first large carrier air group in the U.S. Navy, was established at NAAF Otis Field, Mass., for duty on board *Midway* (CVB 41).

2 May: First helicopter rescue — Lt. August Kleisch, USCG, flying an HNS-1, rescued 11 Canadian airmen who were marooned in northern Labrador about 125 miles from Goose Bay.

9 May: *U-249*, the first German submarine to surrender after the cessation of hostilities in Europe, raised the black surrender flag to a PB4Y of Fleet Air Wing 7 near the Scilly Islands off Lands End, England.

10 May: In a crash program to counter the Japanese Baka (suicide) bomb, the Naval Aircraft Modification Unit was authorized to develop Little Joe, a ship-to-air guided missile powered with a standard JATO (jet assisted take off) unit.

15 Jun: Experimental Squadrons XVF-200 and XVJ-25 were established at Brunswick, Maine, to provide, under the direct operational control of Commander in Chief, U.S. Navy, flight facilities for evaluating and testing tactics, procedure and equipment for use in special defense tasks, particularly those concerned with defense against Kamikazes.

16 Jun: Naval Air Test Center, Patuxent River, Md., was established under a commander responsible for aviation test functions formerly assigned to Naval Air Station, Patuxent River.

landplanes. Hydropneumatic catapults soon followed, and in November 1934 the Naval Aircraft Factory (NAF), Philadelphia, Pa., began constructing the H-1 flush-deck catapult.

Yorktown and *Enterprise*, commissioned in 1937 and 1938 (as well as a few subsequent carriers), were each fitted with an athwartships catapult on the hangar deck, along with two bow catapults on the flight deck. Both ships made their first catapult launches on 4 August 1939, scarcely a month before the outbreak of war in Europe. *Wasp*, during her first year of operation, mid-1940 to 1941, made only three dozen live catapult launches. After the U.S. joined the war, hangar deck catapults were removed from existing carriers. Until mid-1943, however, *Essex*-class carrier plans called for hangar deck catapults.

In April 1943 *Enterprise* recommended her catapults be removed because they were so limited to small, slow airplanes that they were of no use. Instead, they were replaced with updated H2-1 catapults capable of accelerating an 11,000-pound airplane to 70 mph in a 73-foot run. In February 1944 Commander Naval Air Force, Pacific Fleet, reported that catapults were important for all carriers and were vital for CVEs and CVLs. They became so essential to the CVE mission of aircraft resupply that all Army fighters earmarked for the Pacific were fitted for catapults while on the production line.

Most catapult development was carried out by the Naval Air Material Center, Philadelphia, Pa., and its predecessor, NAF. Catapults for carriers, battleships and cruisers underwent continuous improvement.

Several specialized catapults were developed. Expeditionary catapults for overseas bases were diverted to training command air stations. A catapult to launch a 60,000-pound flying boat from a large barge was designed, built and tested and plans were made to join two of them to launch a 120,000-pound flying boat. Conversion of the *Mars* PB2M patrol planes to JRM transports and cancelation of other large flying boat projects eliminated those needs. Jet Assisted Take Off, developed by Engineering Experimental Station, Annapolis, Md., and CIT, eliminated the need for catapulting smaller boats. A spring catapult to launch "cub" aircraft from LSTs (tank landing ships) was tested. The Army's Brodie Gear with a wire cable for landing and takeoff was installed on one LST.

In later experiments, pressure in a hydraulic catapult neared the critical point where fluid would flash into vapor with an enormous increase in volume and the potential for a disastrous explosion. In December 1944, based upon a German device, study of a slotted cylinder catapult began. Fluid pressure moves a piston through a cylinder, and a linkage through the slot connects the airplane and piston so they move together. The key element is a flexible sealing strip that tightly closes the slot behind the piston. Activating fluids studied included gas, steam and fuel oil. Thus, if the steam catapult was not anticipated, its possibility was foreseen.

On a more urgent level, at war's end projects were under way to improve almost every detail of catapults, including improved bridle catchers, retracting chains to reposition battleship and cruiser catapults, and piston decelerators. Looking to the immediate future, the XH8 hydropneumatic catapult was developed for jet aircraft; the goal was to launch a 15,000-pound aircraft at 120 mph with 40-second intervals between launches.

Flywheel catapults based on those originally on *Lexington* and *Saratoga* were studied; a large spinning flywheel stored a lot of energy, but problems with the clutching mechanism were never solved. Electric catapults were tested: an electric motor's rotor and stator were replaced by flat surfaces so that electricity pulled one over the other directly providing forward motion. An electric catapult was operated at Patuxent River, Md., for several years.

Wartime Technology

A brief article cannot thoroughly survey the vast scope of aeronautical development. During the war, improvements were made in almost everything involving flight and flight support: shipboard gear, such as arresting gear, barriers and barricades; safety and survival gear, including oxygen equipment, anti-G suits and life rafts; aircraft instruments; aerological and meteorological equipment; photographic equipment and interpretation; Link trainers and target aircraft and kites for training; and construction materials and finishes. The list could go on and on.

A follow-on half century of vigorous development of military technology has yielded few entirely new areas, notably lasers, transistors, infrared devices, supersonic aerodynamics and flight and high-altitude photography. Science and engineering have made great refinements in all areas of Naval Aviation, but in most respects, modern equipment can be traced to WW II antecedents. ■

Mr. Pearson was a naval historian from 1947 to 1977, when he retired from the Naval Air Systems Command.

Awards

People of the Year:

CARGRU-6: PO1 John L. Cranmer—**Sailor**.

CGAS Barbers Point: AE2 John Lovejoy—**Coast Guardsman**.

COMICEDEFOR: AK1(AW) Maureen E. Sims—**Senior Military Member**, AK2(AW) Blake W. Kent—**Military Member** and Cpl. Jason C. Morris, USMC—**Junior Military Member**.

COMNAVAIRPAC: AC2 Brian Kerby—**Air Traffic Controller**.

COMSTRIKFITWINGPAC: Pat Cranmer—**Civilian**.

Constellation (CV 64): DC1(SW) Gary W. Dedmon—**Sailor** and DS3 Robert A. Westlund—**Warrior**.

PATWING-5/VP-23: AK1(AW) Patricia E. Romano—**Overall Sailor**.

TRAWING-1: AK1(SW) Anthony Wilkes—**Staff Sailor**.

TRAWING-1/VT-19: AO1(AW) Doyle Townsley—**Overall Sailor**.

Eisenhower (CVN 69): HM1(AW) Roger Grose—**Sailor**.

FASO Det Lemoore: AZ1(AW/SW) Vincent E. Sloan—**Sailor**.

HCS-85: AW1(NAC) Paul D. Keener—**Sailor**.

HS-1: LCdr. Barry Dykes—**Instructor**.

HS-6: LCdr. Thom Burke, Lt. Mona Easley, AW1 Richard Fries and AW3 Steven Travis—**Aircrew**.

HS-7: Ltjg. Dean Ostera—**Maintenance Officer** and Cdr. John Bader, Lt. William Butler, AWC John Hatfield and AW2 Robert Kinkton—**Aircrew**.

HS-15: AMHAN Brian Rowe—**Plane Captain**.

HSWINGLANT/HS-15: AW1(AW/NAC) Kevin W. Gregory—**Sailor**.

HSL-37: AW2(AW) Guy C. Venuti—**Shore Sailor**.

HSL-40: Lt. T. S. Barbier—**Officer**.

HSLWINGLANT: AD1 Jorge L. Ramos —**Sailor**.

HSLWINGPAC/HSL-37: AW1(AW/SW) Joseph Chaput—**Sea Sailor**.

HT-18: Lt. Domenick Micello—**Bell Helicopter Instructor** and AD3 Mark A. Miller—**Junior Sailor**.

Inchon (LPH 12): EW1(SW) Andrew W. Maltsai—**Sailor**.

John C. Stennis (PCU): MM3 Keith Massey—**Junior Sailor** and MM1 Thomas Radlbeck—**Sailor**.

MCAS Yuma: RP2 Rodney Johnson—**Sailor**.

NAMTRAGRUDET Whidbey Island: AE1(AW) Joseph Perdue—**Sailor**.

NATTC Millington: GySgt. Dana M. Anderson—**Instructor**.

NAS Jacksonville: PN1(AW/SW) Reginald Fields—**Sea Sailor** and AMS1(AW) Mark Thompson—**Shore Sailor**.

NAS Kingsville, ATC: AC2(AW) Tonya Ipsen—**Sailor**.

NAS Meridian: AO1(AW) Gary Davenport—**Senior Sailor**, LN2 Melanie Pike—**Sailor** and AK3 Amanda Gibson—**Junior Sailor**.

NAS Meridian MATSG: Sgt. Robert Willis—**Marine**.

NAS Miramar: NC1(AW) Eugene Patterson, Jr.—**Sailor**.

NAS North Island: AMS1(AW) Jeffrey N. Feehley—**Sailor**.

NAS Patuxent River/NAWCAD: AC1(AW/SW) Joel A. Doane—**Sailor**.

NAS Pensacola: Sue McClure—**Civilian**.

NAVAIRES San Diego: AO1 David B. Cox—**Sailor**.

NAVAIRPAC 1094: AZ1 Lloyd Brandt—**Sailor**.

NAVLANTMETOCFAC Jacksonville: ET1(SW) David Denman—**Shore Sailor** and AG1(SW/AW) Michael Boyter—**Sea Sailor**.

NB Jacksonville: AC1(AW) Shawn Carsley—**Sailor**.

NAVFITWEPSCOL: AMS1 Cheryl C. Roseland—**Sailor** and SSgt. Sam Garza—**Marine**.

Navy/Marine Corps Worldwide Support Equipment Technician Association: Sgt. Chad A. O'Brien—**Support Equipment Technician**.

NTTC Meridian: SSgt. Carl Burkhamer—**Instructor**.

PATWING-5: AW1(AW) Thomas Quick—**Staff Sailor**.

Reserve Officers Assoc.: Capt. Charles T. Swafford—**USMC Reserve Junior Officer** and LCdr. Colin L. Kiser—**Navy Reserve Junior Officer**.

Saipan (LHA 2): AO1(AW) Larry McConkey—**Sailor**.

SWATSLANT: AO1(AW) David M. Jarosz—**Sailor**.

Strike Aircraft Test Squadron, NAWCAD: AMS1(AW) Allen Clayton—**Sailor**.

TRAWING-6: AK1(AW) Carolyn Jean Stune—**Sailor**.

VA-52: AE1(AW) Robert Gunther—**Sailor**.

VA-115: AE1(AW) Dale Stenson—**Sailor**.

VA-128: YN1(SW) Earnest L. Hall—**Sailor**.

VAQ-129: AT1(AW) Edward E. Rancourt—**Sailor**.

VAW-112: AE1(AW) Charles Patterson, Jr.—**Sailor**.

VFA-82: ADC(AW) Elmer G. Kauffman—**Chief Petty Officer** and AD1(AW) Douglas C. Goff—**Sailor**.

VFA-125: AE1(AW) David Clark—**Sailor**.

VFA-137: AMS1 Elmer Edwards—**Sailor**.

VFC-13: AD1(AW) Eulogio G. Arizala—**Sailor**.

VP-5: AW1 Steven Tibbitts—**Sailor**.

VP-8: AW1(AW) Jeffrey M. Tanner—**Sailor**.

VP-26: AMS1 John Clamors—**Sailor**.

VS-21: AME1 Gene R. Carrey—**Sailor**.

VS-24: AO1(AW) Mack Lawrence—**Senior Sailor** and AMH3 Albert Hawkins—**Junior Sailor**.

VS-41: AT1 David Winrow—**Senior Sailor** and YN3 Todd Fallin—**Junior Sailor**.

VT-7: AK1 Morris French—**Sailor**.

VT-19: AK1 Lyndon Smiling—**Sailor**.

VX-1: AT1 David Madera—**Sailor**.

Patrol Squadron Special Projects Unit 2 presented the **Air Medal with Combat "V"** to Lt. Timothy M. Kersey, PO1 James W. Adkisson and PO1 Angel R. Acevedo for flying in support of Task Force Ranger, a part of Operation Continue Hope. The three were commended for their actions during a combat reconnaissance flight 3 October 1993. The crew encountered hostile small arms fire while providing key enemy position information to U.S. forces on the ground.

Capt. Jeffrey W. Lark, USMC, an HT-18 flight instructor, earned the **Air Medal** for successfully flying direct combat support missions with HMM-164 and HMH-361 during Operation Restore Hope in Somalia.

VT-86 earned a **Meritorious Unit Commendation** for more than 200,000 mishap-free flight hours. RAdm. William B. Hayden, Chief of Naval Air Training, presented the award to the squadron for training 167 Naval Flight Officers while surpassing 220,231 flight hours with no accidents from 1 October 1992 to 30 September 1993.

The **Golden Anchor** is presented to commands that achieve outstanding success in personnel retention. Recent recipients include *Theodore Roosevelt* (CVN 71), HS-14, VC-6, NAESU Philadelphia, Pa., *Kearsarge* (LHD 3) and NAS Pensacola, Fla.

NAS Lemoore, Calif., earned the **COMNAVAIRPAC Bronze Hammer** for excellence in the Self Help program. The program saved over $625,000 in contract labor costs while personnel refurbished barracks and renovated unit and squadron spaces. NAS Lemoore will now compete for CNO's Bronze Hammer Award.

NAS Jacksonville, Fla., received the **1994 Secretary of the Navy Resource, Recovery and Recycling Award** at the sixth annual Navy Environmental and Natural Resources Program Managers' Conference in Norfolk, Va. In 1994 the Jacksonville Recycling Center processed more than 325 tons per month of cardboard, office paper, glass, aluminum, steel cans, pallets, batteries and plastic. The savings amounted to more than $389,000.

HS-7 received the **Commander Helicopter Antisubmarine Wing, U.S. Atlantic Fleet, Maintenance Excellence Award** for the period July to December 1994. The HS-7 maintenance department kept the squadron's six 36-year-old Sikorsky SH-3H *Sea Kings* flying with aircraft availability rates averaging 95 percent. During the award period, HS-7 maintained a 100 percent sortie completion rate. HS-7 is transitioning to the SH-60F Seahawk.

The F-14 community recognized 1994 outstanding performers from five *Tomcat* competitions: **High Noon**—Lt. Glen Gram, VF-11 (individual) and VF-31 (overall); **Air-to-Ground Bombing**—Lts. Brian Riggs and Dean Klein, VF-111 (individual) and VF-211 (overall); **Fighter Derby**—LCdr. Frank Shaffer, Ltjg. Peter McDonough and Lts. Brad Hendricks and William Butler, VF-2 (best section) and VF-31 (overall); **Photo Derby**—VF-211; and **Electronic Counter-Countermeasures**—VF-31.

VFA-147 was awarded the **1994 Scott F. Kirby Ordnance Proficiency Award** for displaying outstanding performance in all aspects of ordnance handling and the Conventional Weapons Technical Proficiency Inspection.

Lt. Daniel L. Cheever, VFA-195, received the **Wesley L. McDonald Leadership Award**.

NADEP Cherry Point, N.C., announced its **Equal Employment Opportunity and Federal Women's Program** award recipients: Ruth W. Kyle—**Woman of the Year**; Jennifer Spivey—**EEO Leadership**; George A. Lupton—**EEO Supervisory**; Coolidge Hamlett—**EEO Nonsupervisory**; and A-4 Aircraft Repair Shop—**EEO Unit**.

PR1 Gregory A. Carroll earned the **Margaret Flowers' Civic Award** presented by the Pensacola, Fla., Navy League. The award recognizes the top Navy volunteer for the area. PR1 Carroll, a high-risk swimming instructor for the Naval Aviation Schools Command, devoted over 290 hours as a Red Cross instructor, teaching classes in first aid, CPR and emergency water safety. Carroll served as assistant facilities coordinator for the 1994 Escambia County Special Olympics. He was also named **Naval Aviation School Command's 1994 Sailor of the Year**.

HSL-51 captured the **1994 NAF Atsugi, Japan, Captain's Cup Trophy** for overall sports achievement. HSL-51's accomplishments included softball, flag football and 5K run championships.

VFA-204 earned the **F. Trubee Davison Award** as the best tailhook squadron in the Naval Reserve.

NAS Whiting Field received the **Florida Department of Education Commissioner's Business Recognition Award** for its positive involvement with area schools.

John C. Petz, a flight engineer at NAS Patuxent River, Md., was presented the **John E. Burdette Memorial Award** for his work with SH-3 and SH-60 helicopters.

Lamar Wasdin, NADEP Pensacola, Fla., was named the **1994 Federal Manager of the Year** by the Federal Managers Association.

The American Institute of Aeronautics and Astronautics honored NASA engineer Robert S. Ryan with the **Walter J. and Angeline H. Crichlow Trust Prize**. Ryan, who is being recognized for his contributions to the Apollo and space shuttle projects, will receive a citation, a gold medal and $100,000.

The Aircraft Intermediate Maintenance Department, NAS Miramar, Calif., was the first recipient of the air station's **1994 Environmental Compliance (Hazardous Material) Award**, which will be presented annually to the command most attentive to hazardous material safety. A command is judged by the quality of its accumulation site, record keeping, training and all-around environmental compliance, including recycling.

Anniversaries

Battle of Coral Sea	May 1942
Battle of Midway	June 1942
HMM-361	43 Years
Naval Test Pilot School	50 Years
Naval Reserve	80 Years
NAS Cecil Field	52 Years
Seventh Fleet	52 Years
VF-32	50 Years

LCdr. D. L. Moak

A VFA-204 F/A-18 Hornet prepares to launch from the deck of Enterprise (CVN 65).

Records

Several units marked **safe flying time**:

UnitHours	Years	
VT-86	200,000	1
VS-31	100,000	
VP-46	219,000	31
HS-15	32,000	10
VAQ-134	34,000	24
VF-154	37,000	10
NAS Sigonella	70,000	29
HSL-44	60,000	7
VRC-30	118,000	19
VS-38	30,000	7
VMFA (AW)-332	60,000	16
HMH-46	225,000	

Special Records

VA-34's **LCdr. Mark Converse** and **Lt. Michael Vangheem** surpassed 1,000 A-6E *Intruder* flight hours, and **LCdr. Phil Hurni** achieved 2,000 *Intruder* flight hours.

VAQ-131's CO, **Cdr. Stephen Hoefel,** achieved 800 EA-6B *Prowler* arrested landings; **LCdrs. Matthew Bouzek** and **Jerry Greenblatt**, **Lts. Jay Burkette, Shaun Hollenbaugh** and **Jeff McIrvin** all earned their first "Centurion" patch, signifying 100 arrested landings; and **LCdr. Mike Shea** chalked up his 1,000th EA-6B *Prowler* flight hour.

Essex (LHD 2) logged her 10,000th landing 3 February.

Nassau (LHA 4) celebrated her 90,000th landing 9 January.

HS-14, NAF Atsugi, Japan, recorded its 1,000th SH-60F flight hour. The squadron had transitioned to the SH-60F in April 1994 and changed home ports from NAS North Island, Calif., to NAF Atsugi. HS-14 also earned its third straight CNO Safety Award.

VFA-94's CO, **Cdr. Jeff Ashby**, recorded his 1,000th arrested landing, aboard *Abraham Lincoln* (CVN 72).

VAW-124's CO, **Cdr. Ralph R. Costanzo**, recorded his 5,000th flight hour in the E-2C *Hawkeye*.

Cdr. David B. Martin, CO of VFA-105, logged his 5,000th mishap-free tactical jet flight hour.

VAQ-129 honored the following individuals for 1,000 EA-6B *Prowler* flight hours: **Lts. Bill Lawler, Sean Cassidy** and **Chuck Stalzer** and **Capt. Dave Ross**, USMC.

Bill Oosterink

Rescues

The **NAS Fallon, Nev., Search and Rescue** (SAR) team rescued a downed balloonist from Wheeler Ridge near Bishop, Calif., 2 February. The victim was using a hot air balloon to tape a television commercial when the wind shifted and he was forced to make a landing at 10,600 feet elevation. The UH-1N crew recovered the 54-year-old male victim and delivered him to the taping crew's base of operations.

Fallon's SAR team was called out again on 24 February to rescue a stranded male kayaker near the Feather River in Plumas County, Calif. The county sheriff's department could not reach the kayaker, because he was located in a rocky area without roads and with steep cliffs nearby. Once the SAR team located the victim, the helo pilot executed a one-skid landing allowing the crew's corpsman to exit the aircraft and assist the injured man. The pilot then performed another one-skid landing in order to bring the corpsman and the victim safely aboard the helicopter.

The **VP-26** *Tridents*, NAS Brunswick, Maine, spearheaded a major search and rescue effort 9–14 December 1994. The Ukrainian freighter *Salvador Allende* began taking on water in stormy seas 950 miles southeast of NAS Brunswick, and 31 crew members abandoned the 450-foot vessel in lifeboats. The initial search was hampered by 30-foot seas and 60-knot winds. The Tridents reported the spotting and recovery of one survivor on 10 December. VP-26 coordinated the efforts of numerous aircraft and surface vessels working to save the lives of the remaining freighter crewmen, while flying over 85 hours in six days in support of the rescue. The search was called off 14 December, without finding additional survivors.

A **CGAS Elizabeth City, N.C.**, H-60 rescue helicopter launched 23 January to assist the 42-foot sailing vessel *Mirage*, which reported flooding and a disabled engine. The ship was in 20-foot seas and 40-mph winds 380 miles east of Savannah, Ga. The H-60 crew arrived on scene, assessed the situation and began hoisting the *Mirage* sailors. The rescue swimmer was lowered to assist the boat's crew into the H-60's rescue basket after they jumped overboard one at a time. While hoisting the third of the five sailors, the hoist operator noticed the hoist cable malfunctioning, which rendered it useless. This problem left ASM1 Michael Odom in the water, with only a survival raft, a radio signaling device and two sailors still aboard the *Mirage*. A second helo arrived five hours later. Odom's body core temperature had dropped to a dangerously low 92.5 degrees F, and he was suffering from exhaustion and hypothermia. Odom was flown to the nearest medical facility aboard *Ticonderoga* (CG 47), which happened to be in the area. After landing, the helicopter crew refueled and launched to relocate the ship and assist its remaining crew members.

AC3 Michael Ferrell and **ACAN Donald Moran**, NAS Kingsville, Texas, helped save the lives of five passengers of a van that was involved in an accident near Palestine, Texas. The van lost its right rear wheel, causing it to veer out of control. The van then struck the median, flipped two and a half times and landed upside down. Ferrell and Moran pulled over and helped three of the accident victims out of the van through the blown-out front windshield. They prevented the van from exploding by securing oil and gasoline leaks and provided first aid to two injured passengers in the back of the van, assisting one man with an apparent broken arm and comforted another with a possible broken neck until police and paramedics arrived.

NAS Key West, Fla., Search and Rescue successfully rescued three separate medical emergency victims during a five-day span: On 22 February, the SAR team evacuated a sailor with kidney trouble from *Stout* (DDG 55). A 75-year-old man suffering from a possible

heart attack was transported from the cruise ship *New Amsterdam* on 24 February. The third medevac took place 27 February when the SAR team evacuated a 60-year-old male heart attack victim from a 25-foot fishing vessel. In one short week, NAS Key West SAR doubled its year-to-date medevac total from three to six.

Scan Pattern

RAdm. David R. Morris, Deputy Commander in Chief U.S. Naval Forces, Europe, inherited the title "Gray Eagle" in a ceremony 21 March aboard *America* (CV 66) pierside in Norfolk, Va. The title signifies the officer on active duty with the earliest designation as a Naval Aviator. RAdm. Morris earned his Wings of Gold in June 1959. His tours of duty include Fighter Squadron 124 as an F8U *Crusader* pilot, *Ranger* (CV 61) as air operations and operations officer and commanding officer of VF-24 aboard *Hancock* (CVA 19) conducting flight operations off the coast of Vietnam.

VS-33 welcomed **Ltjgs. Mary J. Keimig** and **Rosemary Shuck**, the first female Naval Flight Officers to be assigned to a fleet S-3B *Viking* squadron.

An Mi-24F ***Hind*** visited MCAS Yuma, Ariz., 4 February. The visit gave some personnel a chance to see the gunship up close and one lucky pilot the opportunity to fly the 26,000-pound aircraft. During the cold war, the *Hind* was the former Soviet Union's premier attack helicopter. Over the years, Marine Air Wing Training Squadron personnel concentrated on ways to counter the *Hind*, with special emphasis on developing air combat maneuvers against the gunship. This particular *Hind* belongs to the U.S. Army Operational Test and Evaluation Command Threat Support Activity, Fort Bliss, Texas. It is being considered for future use in the Weapons and Tactics Instructor course, which would help pilots not only identify the gunship in combat, but also learn its limitations and formulate effective maneuvers against it. The *Hind* can be found operating in countries such as Algeria, the former Czechoslovakia, Iraq, Libya, Peru, Syria and former Warsaw Pact countries.

VRC-30, NAS North Island, Calif., has expanded its theater of operations to include the Kanto Plain of Japan. VRC-50, based at Anderson AFB, Guam, was disestablished 29 September 1994, leading to the creation of VRC-30 Det 5, established at NAF Atsugi, Japan, 7 August 1994. Det 5 is the first permanently forward-deployed carrier logistics detachment in the Navy. **VRC-30 Det 5** flies the C-2A *Greyhound* as part of Carrier Air Wing 5, which supports the *Independence* (CV 62) Battle Group and Commander Fleet Air, Western Pacific. The det's primary mission is carrier onboard delivery, which includes transporting personnel, cargo and mail. The detachment's aircrew are also qualified to provide airdrop/paradrop support for special warfare units Department of Defense-wide. LCdr. J. A. Hubbard relieved Cdr. L. C. Shaffer-Vanaria as Officer in Charge of VRC-30 Det 5 in a Change of Charge ceremony 1 December 1994.

The **HS-5** *Nightdippers*, NAS Jacksonville, Fla., ended an era when they transferred the last of their SH-3H *Sea King* helicopters to HC-85, NAS North Island, Calif. HS-5 logged over 108,000 flight hours with SH-3Hs. The *Nightdippers* now operate the SH-60F *Seahawk*.

A memorial service was held at the NAS Lemoore, Calif., base chapel for **Lt. Glennon Kersgieter** of VFA-22, who was declared lost at sea 29 January following a mishap (see *NANews*, Mar–Apr 1995, p. 6) that occurred while *Abraham Lincoln* (CVN 72) was conducting routine flight operations off the coast of southern California.

VMFA-232 transferred to NAS Miramar, Calif., from MCAS El Toro, Calif., 8 February. The move comes as MCAS El Toro continues to prepare for shut-down under the Base Realignment and Closure Act. This is the second such move for VMFA-232 in less than two years, having transferred to El Toro from Kanehoe Bay, Hawaii, approximately 18 months ago.

Sandy Russell

The owner of Trader Jon's (left) poses with Stan Russell, retired Naval Aviator and husband of *NANews* Managing Editor Sandy, in the infamous establishment frequented by aviators during their training command tour at NAS Pensacola, Fla. The Russells were on vacation in February when they visited what is billed as the "most talked about bar in America," which opened in 1942. True to his tradition, Trader Jon still offers a $100,000 reward to anyone who catches him wearing matching socks.

The Department of Defense named the **Experimental Aircraft Association** (EAA) as a participant in an official 50th anniversary observance marking the end of WW II. EAA will commemorate the occasion with WW II activities during its annual Fly-In convention, 27 July–2 August at Wittman Regional Airport in Oshkosh, Wisc. The convention features one of the world's largest gatherings of WW II aircraft.

Correction

An *NANews*, Mar–Apr 1995 "People, Planes and Places" article stated that AO1 Donald Huppman and AO3 John Burleigh of VP-40 were the last Aviation Ordnancemen to fly aboard a P-3 as aircrewmen. It should have read that Huppman and Burleigh were the last two "regular Navy" Aviation Ordnancemen to fly aboard a P-3 as aircrewmen. Reserve patrol squadrons have a waiver to fly their AOs—both TAR (Training and Administration of Reserves) and Selected Reserves—through the end of FY 1995.

Steven Hill

An F4U Corsair on static display at Oshkosh '94.

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

Elliott, Maj. John M., USMC (Ret.). *The Official Monogram US Navy & Marine Corps Aircraft Color Guide, Vol. 4, 1960–1993.* Monogram Aviation Publications, Box 223, Sturbridge, MA 01566. 1993. 203 pp. $49.95.

All good things must end and that applies to Maj. Elliott's exhaustive study of naval colors, numbers and markings. This is the fourth and last volume of the series. (Vol. 2, 1940–1949, is out of print already but is planned for reprinting in mid-1995.) To a large extent, this book was probably the hardest to assemble and write because the 33 years it describes saw some of the most outlandish colors and markings seen on any military aircraft and, in dark contrast, some of the most unimaginative, dull schemes and markings ever applied. So, the author had his work cut out for him. Happily, he succeeded. (There have been many books and articles about military aircraft colors and markings, enjoying varying degrees of success. See the review for *Hook Code*, Jan-Feb 1995 issue, for the other end of the spectrum.)

There are a few typos and captioning errors involving plane and squadron designations and what appears to be an occasional lack of understanding as to what the circumstances were, such as page 43, which shows an RF-8G of VFP-63 "in a beautiful but nonregulation paint scheme." The full-tail, red-white-and-blue bands on the photo-*Crusader* were this squadron's 1976 Bicentennial markings—nonregulation, perhaps, but decidedly with a purpose that was sanctioned by the Navy.

I also missed a few of the more offbeat examples. I would have liked to see a photo or painting of an H&MS-11 TF-9J or HAL-3 UH-1B in Vietnam, but a few personal preferences don't detract from this impressive work.

The most appealing elements of this book—as well as the entire series, which is certain to become a standard reference as well as a collector's item—are the well-printed color and occasional black-and-white photos, well-done paintings and various schematic diagrams.

Marolda, Edward J. *By Sea, Air and Land: An Illustrated History of the U.S. Navy and the War in Southeast Asia.* Naval Historical Center, Washington, DC 20374. 1994. 416 pp. Ill. $43.

A new book on the war in Vietnam is a rare thing today. With several other conflicts and political confrontations occurring after the Communist takeover of South Vietnam in 1975, the long, bloody and costly Southeast Asian war has receded from the public consciousness. However, this fine, well-researched and copiously illustrated volume is all the more welcome. Including more than 500 photos, maps and charts, this large-format book is an impressive, one-volume treatment of the U.S. Navy's experience in the war.

There are many color and black-and-white photos, as well as color reproductions of paintings by the troop of combat artists the Navy sent into the area throughout the war. (I must admit to never having seen John Steel's work, and it is a happy discovery since the book uses several of this talented artist's paintings.)

The photos take advantage of the book's size and readers of this column won't be disappointed, because Naval Aviation is well served. Every community—from F-8s to F-4s, to A-4s, RA-5s and UH-1 gunships—is covered. People are also well shown, from the struggling ordies tying the fuses onto Mk 82s to Vice Admiral John J. Hyland sporting a black beret as he visits the brown water Navy as Commander, Seventh Fleet.

The text is succinct and includes nuggets of information that more expansively written narratives ignore. There are several appendices, and these sections include information on MiG kills, Navy recipients of the Medal of Honor, aircraft tail codes and carrier deployments.

Although the Naval Historical Center's books are not as well known as they should be, they are, in fact, among the most important historical volumes being published. This new book advances the NHC's growing reputation as well as that of the author, who served in Vietnam as an Army officer.

Stillwell, Paul, ed. *Assault on Normandy: First-Person Accounts From the Sea Services.* U.S. Naval Institute, Annapolis, MD 21402. 1994. 324 pp. Ill. $36.95.

This is a fine collection of personal essays and reminiscences complemented by a good selection of photos and combat art (although I wish a few of the paintings could have been reproduced in color). The editor, director of the USNI oral history program, also edited a similar presentation on Pearl Harbor.

This new book also includes a separate section on "Operation Dragoon," the little-publicized invasion of southern France, eclipsed by the emotional arrival in the north. There are accounts by famous and not-so-well-known personalities. Actor Douglas Fairbanks, Medal of Honor awardee and PT boat skipper John Bulkeley, seamen and admirals all contribute their impressions and experiences. While American participants are the main source of accounts, British, French and German servicemen relate their stories. There's not a lot of aviation in the pages, especially Naval Aviation. Air power was supplied largely by U.S. Army Air Forces and Allied squadrons, which provided a combination of close air support and preinvasion bombardment, as well as flying air superiority missions against the German aircraft that contested the landings.

With all the attention that accompanied the 50th anniversary observance of D day, this book is perhaps one of the longer-lasting accounts of the experience.

1995 Naval Aviation Ball

The 22nd annual Washington-area Naval Aviation Ball, sponsored by the Director, Air Warfare, and in conjunction with the Association of Naval Aviation, will be held on Saturday, 20 May, at the Radisson Hotel, Alexandria, Va.

This formal gathering is open to all active duty and retired Navy and Marine Corps aviators, Naval Flight Officers and other aviation-associated officers, as well as supporting corporate personnel. The evening will commence with a reception at 1830. Dinner will be followed by dancing and entertainment. The cost is $100 per active duty couple, and $150 per couple for guests. Dress is Military, Dinner Dress White/Evening Dress or Civilian, Black Tie.

For information, contact Maj. Mike Heath, N880G1, DSN 223-2933; 703-693-2933; or fax 703-695-1247.

Reunions, Conferences, etc.

VAW-122 reunion planned, spring 1996. Squadron plank owners and former COs please contact: Ltjg. Dermody, 804-444-2456/4704.

Global Air & Space '95, 2–4 MAY, Arlington, VA. POC: American Institute of Aeronautics and Astronautics, 800-707-2345.

PBM Mariner/P5M Marlin reunion, 17–21 MAY, Arlington, VA. POC: John Woodcock, 151 Cardinal Dr., Bellmawr, NJ 08031, 609-931-7577.

USS Guadalcanal CVE 60 Task Group 22.3 Association reunion, JUN 95, Denver, CO. POC: Jack S. Dutton, 35 Graeler Dr., St. Louis, MO 63146-4938, 314-567-3919.

ATCA International Conference and Exhibition, 6–8 JUN, Brussels, Belgium. POC: Carol Newmaster, 703-522-5717.

Aerodrome Days '95, 9–11 JUN, Wichita, KS. POC: Darren McGuire, 3350 George Washington Blvd., Wichita, KS 67210, 316-683-9242.

Okinawa Survivors Assn. Memorial Service and Celebration of Life, 10 JUN, Navy Memorial, Washington, DC. POC: William Glover, Box 4004, Shalimar, FL 32579-4004, 904-862-3808.

Essex (CV/CVA/CVS 9) reunion, 12–18 JUN, Albuquerque, NM. POC: Bob Morgan, 6361 SW 106th Pl., Ocala, FL 34476-4802.

Air Combat Survivability symposium, 13–15 JUN, Laurel, MD. POC: Diane Lussier, 703-902-4882.

CAD/AEPS Integrated Logistics Support Mgmt. Team Meeting, 13-15 JUN, Waldorf, MD, provides forum for interaction between NAVAIRSYSCOM, IHDIVNAVSURFWARCEN and fleet personnel. POC: Pat Cooksey, DSN 354-4163/fax 354-6531; or 301-743-4163.

HC-7 reunion, 15–18 JUN, Pensacola, FL. POC: CDR Paul Skrypek, 623 Ellen Ln., El Cajon, CA 92019, 619-440-4773.

Return to Okinawa 50th Anniversary, 19–25 JUN, Okinawa, Japan. POC: Col. Warren H. Wiedhahn, Box 1179, Arlington, VA 22313-2375.

VC-61/VFP-61/VCP-63/VFP-63 reunion, 23 JUN, NAS Miramar, CA. POC: George F. Nikolas, 1525 Orangewood Ave., Pittsburgh, PA 15216-3732, 412-343-6694.

Association of Aviation Ordnancemen reunion, 29 JUN–2 JUL, Reno, NV. POC: Billy Earl, 145 Koostenai Crescent Rd., Stevensville, MT 59870, 406-777-5891.

Symposium '95

Space Pioneers: The Mercury Astronauts and Flying Tigers 4–5 May

The Naval Aviation Museum Foundation proudly announces its ninth annual Naval Aviation Symposium, which will be held at the National Museum of Naval Aviation, Pensacola, Fla. This series of educational and social events features the presentation of America's daring and pioneering Mercury astronauts, four of whom were Naval Aviators. Also, the seminar will present the American Volunteer Group, the Flying Tigers, who fought the Japanese in China prior to and during the first several months of WW II. The majority of the Flying Tigers were Naval Aviators.

Change of Command

CVW-11: Capt. Dennis M. Gillespie relieved Capt. James D. McArthur, Jr., 10 Mar.

HC-2: Cdr. Mark A. Anderson relieved Cdr. Woodrow W. Long, Jr., 24 Feb.

HMH-462: Lt. Col. Philip S. Parkhurst relieved Lt. Col. Richard H. Dunnivan, 2 Feb.

HS-3: Cdr. Robert H. Magee relieved Cdr. James H. Thompson, 17 Mar.

HS-11: Cdr. Robert L. Wilde relieved Cdr. Gary L. Stark, 17 Feb.

HSL-46: Cdr. Steven M. Bagby relieved Cdr. Walter G. Scull, 2 Mar.

HSL-49: Cdr. Paul M. Pietsch relieved Cdr. Zachary A. Henry, 16 Feb.

HSLWINGPAC: Capt. Kenneth T. Marion relieved Capt. John R. Brown, 27 Jan.

John F. Kennedy (CV 67): Capt. Gerald L. Hoewing relieved Capt. J.R. Hutchison, Jan.

Kitty Hawk (CV 63): Capt. Terry Magee relieved Capt. William W. Pickavance, Feb.

MACG-18: Col. William L. Groves relieved Col. Kenneth B. Levan, 17 Feb.

MALS-16: Lt. Col. Phillip L. Newman relieved Lt. Col. Bonnie J. Robison, 19 Jan.

PHIBRON 8: Capt. Jerome E. Schill relieved Capt. Guy E. Myslivy, 28 Feb.

SWATSCOLPAC: Capt. Arthur W. Gallo relieved Capt. Richard A. Black, Mar.

VAQ-136: Cdr. Thomas R. McCool relieved Cdr. Jerome J. Mathews, 9 Mar.

VAW-115: Cdr. Richard B. Wren relieved Cdr. Martin J. Erdossy, 26 Jan.

VF-14: Cdr. Emmitt D. Dickens, Jr., relieved Cdr. John J. Morrow.

VF-211: Cdr. G.R. Beaman relieved Cdr. J.A. Winnefeld, Jr., 1 Mar.

VFA-15: Cdr. Ted N. Branch relieved Cdr. William Gortney, 6 Jan.

VFA-81: Cdr. Mark I. Fox relieved Cdr. Daniel E. Moore, Jr., 10 Mar.

VFA-105: Cdr. Patrick M. Walsh relieved Cdr. David B. Martin, 16 Feb.

VMFA-451: Lt. Col. James A. Hunter relieved Lt. Col. David R. Dean, Feb.

VMGR-252: Lt. Col. Edgar B. Carr relieved Lt. Col. Bruce E. Bronars, 17 Feb.

VP-16: Cdr. James J. Cardosi relieved Cdr. Robert W. Anderson, 20 Jan.

VP-69: Cdr. Rodney A. Harris relieved Cdr. Carlton D. Parker, 21 Jan.

VQ-5: Cdr. Robert W. Radloff relieved Cdr. Patrick S. Collins, 23 Jan.

VQ-6: Cdr. Daniel L. Wenceslao relieved Cdr. Richard N. Schwenk, 12 Jan.

VT-10: Cdr. John D. Alexander relieved Cdr. Albert J. Gallardo, Jr., 31 Mar.

VTC-21: Cdr. William J. Culbertson relieved Cdr. Jerry L. Manthei, 10 Mar.

VX-9: Capt. Craig F. Weideman relieved Capt. Scott C. Ronnie, 13 Apr.

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