NAVAL AVIATION NEWS

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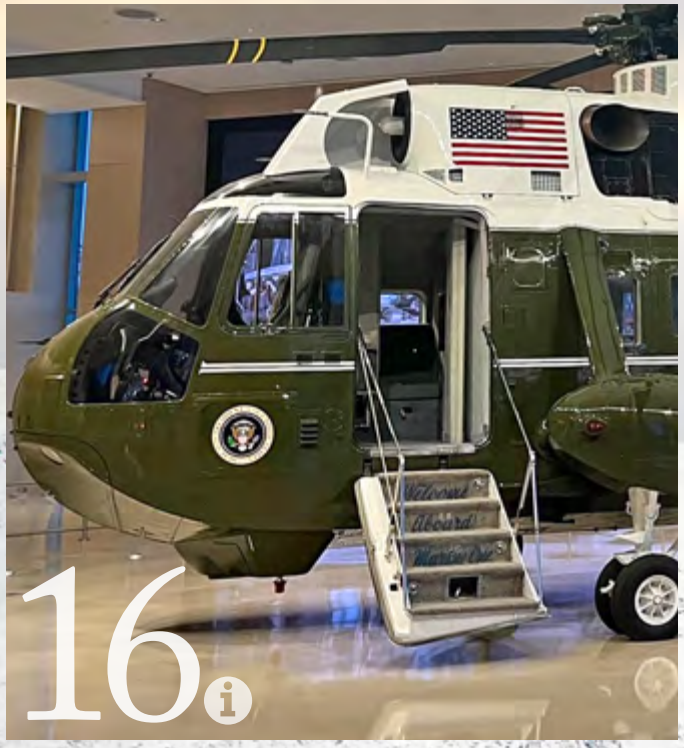
Retired Marine One Makes a Memorable Final Stop

WHAT'S INSIDE



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The Nimitz-class aircraft carrier USS George Washington (CVN 73) transits the Strait of Magellan, June 5. George Washington is deployed as part of Southern Seas 2024.

U.S. Navy photo by MC2 David C. Fines

NAVAL AVIATION NEWS

SPRING 2024 VOLUME 106, NO. 3

DEPARTMENTS

FEATURES

ALSO IN THIS ISSUE

ON THE COVER

On the Cover: *Read the fascinating story, beginning on page 16, of how a collaborative effort between the Presidential Helicopter Program Office and private industry resulted in the delivery of a decommissioned Marine One helicopter used by President George H.W. Bush, BUNO 358, to the George and Barbara Bush Foundation Museum in Texas, where the restored aircraft will remain on display for years to come. (U.S. Navy photo illustration by Fred Flerlage; imagery by Megan Wasel and the George & Barbara Bush Foundation).*

In this issue of Naval Aviation News, *Also in this edition, a former "Rosie Riveter" reflects on her time supporting the war effort 80 years after the allied landing in Normandy. Read her story on page 22. And, on page 26, learn how a new training course is increasing readiness for aircraft suppliers and maintainers.*

On the back cover: *Lt. Misty Beck, stands watch as officer of the deck under instruction in the pilot house aboard the U.S. Navy's only forward-deployed aircraft carrier, USS Ronald Reagan (CVN 76), as part of operations in support of Valiant Shield 2024, in the Philippine Sea, June 11. Exercises such as Valiant Shield allow the Indo-Pacific Command Joint Forces the opportunity to integrate forces from all branches of service and with our allies to conduct precise, lethal, and overwhelming multi-axis, multi-domain effects that demonstrate the strength and versatility of the Joint Force and our commitment to a free and open Indo-Pacific. (U.S. Navy photo by Mass Communication Specialist Seaman Kevin Steffanson)*

The U.S. Navy's Oldest Periodical, Established 1917

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Commands may send news and announcements such as awards, rescues, milestones and other achievements to **navy_nannews@navy.mil**. Approved photos of Naval Aviation-oriented activities are always welcome. For longer feature articles, contact the editor in advance. Military contributors should forward articles about their commands only after internal security review and with command approval. For more information, contact us at **navy_nannews@navy.mil**.

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Airscoop

Compiled by Rob Perry

USS Nimitz Completes Planned Incremental Availability

BREMERTON, Wash.—The aircraft carrier USS Nimitz (CVN 68) departed Puget Sound Naval Shipyard June 19, and headed out to sea after a seven-month planned incremental availability (PIA) period.

Nimitz's PIA began in January 2024, when the ship underwent dedicated maintenance by civilians, contractors, and ship's crew in preparation for their mission of maintaining peace and order in the Pacific and other areas as needed.

"For the past nine months, I had the opportunity to be part of a talented, dedicated and patriotic Navy team all working together to conduct a challenging PIA. What's equally significant is that we're celebrating a longstanding relationship with a remarkable group of public and private sector maintenance professionals at Puget Sound Naval Shipyard (PSNS)," said Capt. Douglas Graber, USS Nimitz commanding officer. "Both the civilian contractors and the Nimitz crew worked tirelessly to ensure Nimitz is at peak condition. Thanks to their dedication, we're prepared to get out to sea and maintain a strong, professional presence wherever our nation requires us to be."

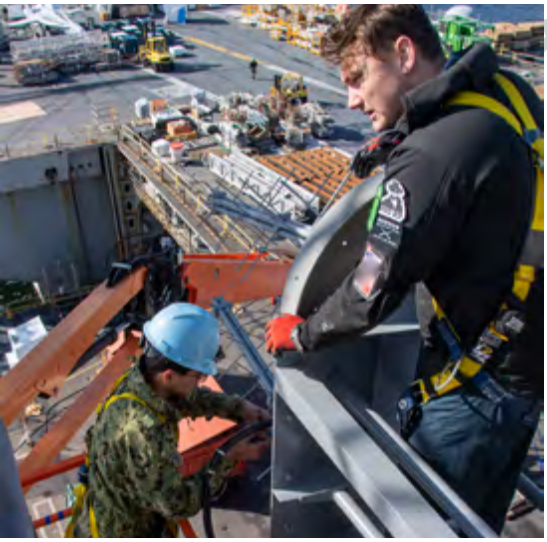
The work completed during the availability ranged from the flight deck and aircraft elevators, to berthing upgrades and combat system improvements.

"Through close collaboration, the project team and Nimitz leadership found effective ways to complete the work while fostering a 'one team, one

USS Abraham Lincoln Completes Board of Inspection

U.S. Navy photo by MCSS Nathaly Cruz

Gunner's Mate 3rd Class Joshua Rivas, right, and Aviation Ordnanceman 1st Class Erik Brown, prepare a MK 38 machine gun system for a live-fire exercise on the fantail of USS Abraham Lincoln (CVN 72).



U.S. Navy photo by MC3 Peter K. McHaddad

Electronics Technician 3rd Class Gage Pierson (above), assists Information Systems Technician 2nd Class Jeffrey Salguero (below), in the repair of an antenna aboard USS Nimitz (CVN 68).

U.S. Navy photo by MCSA Joseph M. Paolucci

Sailors prepare to lower the catapult of USS Nimitz (CVN 68) while in port at Naval Base Kitsap-Bremerton, Washington, March 5.

fight' spirit between the ship's crew and the PSNS & [Intermediate Maintenance Facility] workforce," said Steven Pugh, project superintendent for Code 368. "Together, the PSNS project team and our private sector maintenance partners dedicated over 2,840,000 man-hours to prepare Nimitz and get her ready to be back in the fight."

According to Pugh, completing this work on time was a priority, and a big accomplishment.

Nimitz returned from its last deployment after seven months at sea, where the crew toured the Pacific, maintained freedom of navigation operations in the South China Sea, fostered positive relations with several allied countries, and represented the United States while maintaining projection of power.

Written by Petty Officer 2nd Class Caylen McCutcheon and Petty Officer 3rd Class Peter McHaddad with USS Nimitz (CVN 68) public affairs.

and Survey

SAN DIEGO, Calif.—Nimitz-class aircraft carrier USS Abraham Lincoln (CVN 72) completed its Board of Inspection and Survey (INSURV) assessment May 1.

During INSURV, over 150 inspectors embarked Abraham Lincoln to observe and assess hundreds of spaces, events and demonstrations in port and at sea. INSURV inspectors examined the readiness of multiple warfare areas on the ship, to include engineering, combat systems and navigation, as well as the habitability and quality of living spaces.

"Congratulations to the Lincoln crew for their outstanding performance on this rigorous inspection," said Capt. Pete Riebe, Abraham Lincoln's commanding officer. "Your efforts in ensuring our combat readiness matters, and it does not go unnoticed. You have proven to the Navy and nation that our ship stands ready to go in harm's way and our systems are ready to conduct the full spectrum of operations."

Abraham Lincoln's successful performance is the result of the crew's dedicated efforts and preparation. Leading up to INSURV, the crew completed preceding inspections from Material Condition Assessment Team (MCAT) to ensure the ship and crew were prepared.

INSURV is a Congressionally-mandated inspection of all Navy ships to report ship readiness and ensure all spaces, equipment and warfare areas meet Navy standards required to support and sustain combat operations.

"We are gathered here today as a team to do the vital preparations for the biggest inspection this ship will face in a three-year period, second only to actual combat, and that's our combat readiness inspection," said Lt. Cmdr. Aaron Mitchem, ship's security officer and the INSURV coordinator of Abraham Lincoln. "Combat readiness is our mission, so this inspection is incredibly important. I am excited to show the inspectors that are coming onboard how ready we are to answer the nation's call, anytime, anyplace, anywhere."

Immediately following INSURV, the crew will continue to prepare for ongoing excellence in maintaining combat and mission readiness for the future.

Written by Petty Officer 3rd Class Aleksandr Freutel with USS Abraham Lincoln (CVN 72) public affairs.

The Naval Air Warfare Center Aircraft Division's Joint Simulation Environment is a hyper-realistic digital range that consists of F-35 Lightning, F-22 Raptor, and adversary cockpits, 4K projectors that stretch nearly 360 degrees around pilots, as well as aircraft software that enable pilots to fly wartime scenarios in a near-exact virtual battlespace. The facility also features briefing rooms where pilots review their missions before and after training to learn why they were or were not successful, and how they can improve.

U.S. Navy photo by Terri Thomas

Navy Advances Development of Air Force's New Joint Simulation Environment

PATUXENT RIVER, Md.—Engineers from the Naval Air Warfare Center Aircraft Division (NAWCAD) successfully installed core software in the Air Force's future Joint Simulation Environment (JSE) facility at Nellis Air Force Base in Nevada bringing the service closer to operating its own next-generation training and test facility.

Nellis is the Air Force's premier training and test center for advanced combat aviation.

"The Joint Simulation Environment is the only training range where tactical aviators can fight like they would in real air combat," said NAWCAD Executive Director Steve Cricchi. "NAWCAD's JSE is capability advantage helping American warfighters keep pace with the changing character of warfare—its importance cannot be overstated."

The JSE's core software includes the digital elements that make up the facility including simulated variables like weather, the electromagnetic spectrum, surface and subsurface platforms, enemy aircraft and weapons systems. The software also includes weapons systems like the Advanced Medium-Range Air-to-Air Missile, AIM-9 Sidewinder, Small Diameter Bomb and more.

"NAWCAD's JSE is critical to advancing air superiority and improving service interoperability," said NAWCAD JSE Director Blaine Summers. "Standing up robust, multi-platform training and test capabilities at Nellis underscores our Navy's commitment to partnering with the Air Force."

The JSE is the DoD's next-generation digital test and training range made up of cockpits, domed simulators with 4K projectors and aircraft software. NAWCAD's JSE enables tactical pilots to fly wartime scenarios in a near-exact virtual environment and aircraft developers to push air systems to extreme limits beyond the safety constraints of open-air ranges.

NAWCAD is leading the DOD's effort to scale the capability across the services. The warfare center installed enemy air systems at Nellis in 2023, and will enable F-35 and F-22 operations this year.

Navy and Air Force fighter pilots will begin training together in NAWCAD's JSE this summer, and the JSE is now part of the DoD's formal curriculum for its tactical weapons schools. This includes the Navy's TOPGUN and Air Force's 6th Weapons Squadron, who currently train in the JSE at the warfare center's Patuxent River headquarters. NAWCAD's JSE also trains domestic and allied fighter squadrons stationed across the world as pilots fly more sorties in the JSE over a week than they can on open-air ranges in a year. The command surpassed more than 1,000 F-35 pilots trained in the JSE in March 2024.

NAWCAD will incorporate additional test and training cockpits including the F/A-18 Hornet, EA-18 Growler, and E-2 platforms in its Patuxent River facility, and deploy its second training system onboard a Navy carrier, USS Abraham Lincoln (CVN 72), this year.

From the Naval Air Warfare Center Aircraft Division.

VMU-3 Advancing Operations: The Shift to SATCOM Launch and Recovery

MARINE CORPS AIR STATION KANEOHE BAY, Hawaii—Marine Unmanned Aerial Vehicle Squadron (VMU) 3, achieved a significant operational milestone with the successful execution of a Satellite Communications (SATCOM) Launch and Recovery (SLR) flight with the Marine Air-Ground Task Force Unmanned Expeditionary (MUX) Medium-Altitude, Long-Endurance (MALE) MQ-9A Aircraft System on June 20. This marks the first-ever employment of an all-Marine Corps certified team of active-duty aviators conducting an SLR mission with a Marine Corps aircraft at a Marine Corps Air Station.

Traditionally, launch and recovery elements are tethered to cumbersome Line-of-Sight (LOS) command and control equipment, necessitating specialized aviators and large transport aircraft to begin operations at established airfields. However, SLR leverages current satellite-based infrastructure, enabling Marines to overcome the constraint of LOS by increasing mission range and operational endurance of a forward deployed MQ-9A MUX/MALE, along with expanding the number of available airfields from which VMU-3 can project power.

VMU-3's successful SLR demonstration emphasizes its pivotal role in advancing Marine Corps capabilities in reconnaissance, surveillance and target acquisition missions across the Indo-Pacific region. By minimizing logistical constraints and enabling operations from short airfields over vast distances, SLR supports flights from a central hub to a number of smaller destinations, known as spokes. Utilization of the "Hub-and-Spoke" concept increases flexibility required for modern expeditionary operations. This is critical to maintaining a sustainable, survivable and forward presence anywhere on the globe.

Looking forward, SLR is not just an upgrade, it is a strategic move to keep MQ-9A MUX/MALE operations expeditionary and adaptable. This achievement highlights VMU-3's commitment to innovation and operational excellence and emphasizes the ongoing efforts to integrate cutting-edge technology into operational strategies, ensuring readiness and effectiveness.

"The Marines, Sailors, and Airmen of VMU-3 remain dedicated to expanding joint-force capability alignment throughout future MQ-9A MUX/MALE operations," said Lt. Col. Donald Kelly, the commanding officer of VMU-3. "Our utilization of SLR is the next step in bringing expeditionary support to our warfighters."

Written by 1st Lt. Isis Coty and Cpl. Anabelle Reedobrien with 1st Marine Aircraft Wing.

U.S. Marine Corps photos by Cpl. Joseph Abreu

A Marine Corps MQ-9A MUX/MALE assigned to Marine Unmanned Aerial Vehicle Squadron (VMU) 3, Marine Aircraft Group 24, 1st Marine Aircraft Wing completes preflight checklist during the first Satellite Communications (SATCOM) Launch and Recovery (SLR) mission at Marine Corps Air Station Kaneohe Bay, Hawaii, June 20.

A MQ-9A MUX/MALE assigned to VMU-3, prepares to land onto the flightline after conducting drills during the first SATCOM SLR.

VMFT-402 Begins Standup at Fighter Town East

MARINE CORPS AIR STATION BEAUFORT, S.C.—Three F-5N Tiger IIs arrived May 30 at Marine Corps Air Station (MCAS) Beaufort, South Carolina, as part of Marine Fighter Training Squadron (VMFT) 402's stand up process to serve as an adversary squadron.

"It's a huge day in the lifecycle of our squadron," said Lt. Col. Andrew Christ, commanding officer, VMFT-402, Marine Aircraft Group 41 (MAG-41), 4th Marine Aircraft Wing (4th MAW). "We just delivered the first F-5N Tiger IIs, and it marks a significant milestone in our stand up towards activation."

VMFT-402 will serve as the Marine Corps' second adversary squadron; VMFT-401 located at MCAS Yuma, Arizona, is already in operation. Both VMFT-401 and VMFT-402 will be assigned to MAG-41, 4th MAW, Marine Forces Reserve.

"This is a unique collaboration between the air station and the parent unit of VMFT-401, which will remain MAG-41 in Dallas Fort Worth, Texas, and 4th MAW," Bortnem said, "so this is a very unique partnership that we have with our ability to host aircraft and units that are both part of 2nd MAW and 4th MAW."

"We are expanding to establish a second adversary squadron that is VMFT-402, here in Beaufort, South Carolina," said Maj. Erin Mathis, operations officer, VMFT-402, Marine Aircraft Group 41, 4th Marine Aircraft Wing.

An adversary squadron acts as opposing forces during training with other squadrons. Pilots with adversary squadrons study the tactics and maneuvers of foreign adversaries to employ them in training to create realistic scenarios.

"We, as experts in adversary tactics and experts in the way the adversary fights, provide the fleet units with a unique look at basically what the adversary does," Mathis said.

"The ability for us to have on-station adversary support is absolutely critical to the development of both our fleet F-35 pilots in the future and our current training F-35 pilots," Bortnem said.

Having a local adversary squadron allows for more training opportunities, an easier planning process and allows for VMFT-402 to provide in person debriefs.

"We have a rapidly growing F-35 fleet particularly on the East Coast now and Marine Corps aviation has an insatiable need for as much adversary support and training as they can receive to prepare them for the next fight that's coming," Christ said.

Due to available space to house and support the squadron, and the proximity to Marine Fighter Attack Training Squadron 501 and the closest training ranges, MCAS Beaufort was chosen to be the home of VMFT-402, Bortnem said.

"This has been Fighter Town East since 1950. VMFT-401, the previous squadron, had been here many, many times before. So the ability for VMFT-402 to be housed here just makes perfect sense," he said.

The unit will officially reactivate as Marine Medium Helicopter Training Squadron (HMMT) 402 in September 2024, and will then be redesignated as VMFT-402.

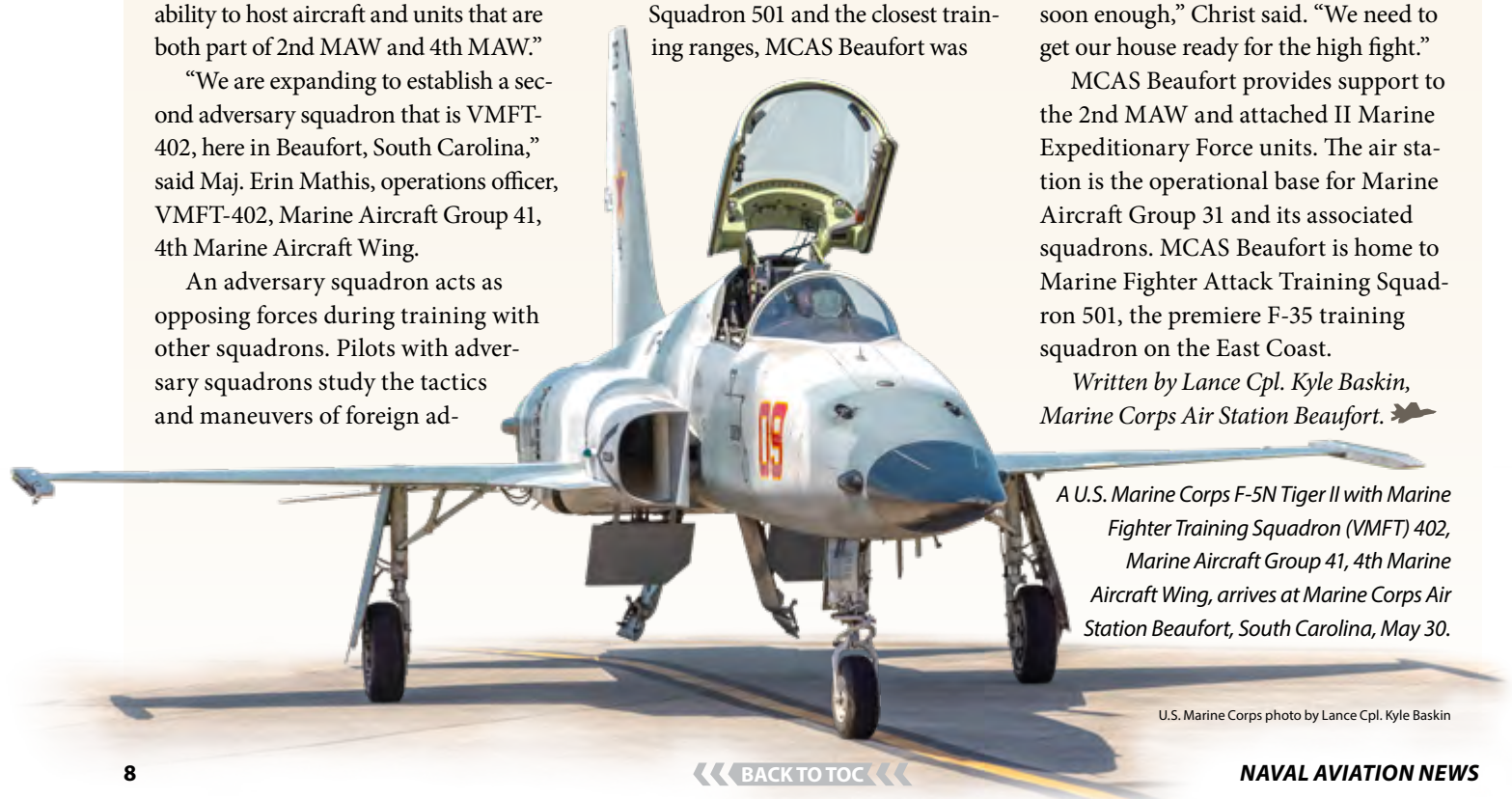
Originally, HMMT-402 was stood up in 1967 and trained helicopter pilots for the Vietnam War, before it was decommissioned in 1972, said Master Sgt. Jason Tracoma, senior enlisted advisor, VMFT-402.

"Our short term goals will evolve over the course of the summer, we're going to go through a number of maintenance inspections to make sure that we're safe for flight operations autonomously," Christ said.

"It's been a long time coming, we've needed this capability on the East Coast for a number of years and can't come soon enough," Christ said. "We need to get our house ready for the high fight."

MCAS Beaufort provides support to the 2nd MAW and attached II Marine Expeditionary Force units. The air station is the operational base for Marine Aircraft Group 31 and its associated squadrons. MCAS Beaufort is home to Marine Fighter Attack Training Squadron 501, the premiere F-35 training squadron on the East Coast.

Written by Lance Cpl. Kyle Baskin, Marine Corps Air Station Beaufort.



A U.S. Marine Corps F-5N Tiger II with Marine Fighter Training Squadron (VMFT) 402, Marine Aircraft Group 41, 4th Marine Aircraft Wing, arrives at Marine Corps Air Station Beaufort, South Carolina, May 30.

U.S. Marine Corps photo by Lance Cpl. Kyle Baskin

U.S. Marine Corps photo by Lance Cpl. Koby I. Saunders

Marines assigned to Marine Medium Tiltrotor Squadron 264 (Reinforced), and 2nd Radio Battalion Detachment, 22nd Marine Expeditionary Unit, prepare for departure to conduct the first operational flight of the Intrepid Tiger II (V)3 Electronic Warfare (EW) pod aboard the amphibious assault ship USS Wasp (LHD-1). The Intrepid Tiger II EW is a network-enabled family of systems that provides a rapid deployment capability to support ground combat operations.

Airborne Electronic Attack Systems Program Office Hosts Inaugural JAMinar Event

PATUXENT RIVER, Md.—The Airborne Electronic Attack (AEA) Systems Program Office hosted its inaugural JAMinar in June. The pilot program aimed to equip new program office personnel with valuable knowledge and program office-focused courses to better support the program office and the warfighter.

The one-day course, dubbed JAMinar in a nod to radar jammers, was designed to provide a short and focused overview of the program office and how it fits into the mission of Program Executive Office for Tactical Aircraft Programs and Naval Air Systems Command (NAVAIR). The goal was to increase the program office's proficiency as it successfully supports the mission of the Navy, Marine Corps and Royal Australian Air Force (RAAF). The Department of Defense and the Australian Department of Defence share a joint cooperative partnership on developing AEA capabilities.

"It is vital to educate our new teammates with the foundational knowledge of AEA and familiarize them with our Joint Program Office (JPO)," said Capt. David Rueter, program manager. "Whether you've worked in NAVAIR for five years or five months, every program office is distinctive and we want to ensure everyone understands the mission and vision of our organization and JPO partnership."

The program office deputy program managers and functional leads joined the class to introduce themselves and explain how their team fits into and supports the program office.

Deputy Next Generation Jammer Cmdr. Tim Phillips joined the class, not only as a leader but also as a student.

"Each NAVAIR-affliated program has a very specific role. How things are done in one [program office] doesn't necessarily translate to another. As a new member of [the program office] myself, I understand there's a learning curve as you navigate through a new office. This class offered an innovative advantage for newcomers as they adjust to their role within the program office," Phillips said.

Subject matter experts within the program office collaborated for six months to identify the most valuable information for new employees and designed thorough but practical 101-style courses, including NAVAIR, the program office overview, Electronic Warfare, EA-18G Growler and JPO. In addition, class participants were invited to tours of Air Test and Evaluation Squadron (VX) 23, the Next-Generation Jammer pod shop, the anechoic chamber where EW is tested, and Air Test and Evaluation Squadron (HX) 21.

While touring VX-23, JAMinar participants learned how the ALQ-99 Tactical Jamming System and Next Generation Jammer (NGJ) pods are integrated onto the Growlers and support warfighters in contested parts of the world. Additionally, the visit to the pod shop provided a unique opportunity to see NGJ close up, gaining a new perspective of the pod's components. In the anechoic chamber, participants viewed how testing is conducted in a controlled environment. Finally, the day wrapped up with a tour at HX-21 to see the UH-1Y which carries the Intrepid Tiger II EW weapon system for the Marine Corps.

"The JAMinar was an invaluable experience not only for newcomers to [the program office] but for anyone looking for perspective on how we fit into the overall NAVAIR and Navy missions. The briefs and tours helped to actualize the work that we do daily and the capabilities that we provide to the fleet," Business Financial Manager Patrick Hart said.

The program office plans to host a JAMinar twice a year.

From the Airborne Electronic Attack Systems Program Office Communications.

CharLES Gives Engineers Clearer Picture of Potential Solutions to Engine Health Issues

PATUXENT RIVER, Md.—CharLES, the aerospace industry's high-fidelity computational fluid dynamics (CFD) solver, is reducing the time and cost it takes to simulate the aerodynamics inside an aircraft's engine and troubleshoot problems.

Developed through NAVAIR's Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) programs, CharLES uses large eddy simulation (LES), computer processing units and graphical processing units (GPU) to achieve results with significantly faster turnaround time than standard approaches.

CFD is a science that uses computations to analyze the mechanics of fluid flows, the temperature, pressure, velocity and density of air or liquid, around and or through an object. This analysis then yields engineering data that can be used to troubleshoot, modify or test an engine, according to Dr. Russell Powers, Naval Air Warfare Center Aircraft Division (NAWCAD) Computational Fluid Dynamics and Noise Branch Propulsion and Flow Modeling Science and Technology Lead. Current industry-standard CFD predictive tools for propulsion applications rely on steady-state turbulence models that approximate the flow and simulate the engine component-by-component. The result? The transient aerothermal interactions between components within gas turbine engines are poorly approximated during design and off-design operations.

That's where CharLES comes in.

"There is a strong persistent need in Naval Aviation for improved CFD tools to support both early trade studies, initial detailed design, system redesign and retrofit efforts related to gas turbine engine development and integration," Powers said.

Originally developed by Cascade Technologies, a small business now part of Cadence Design Systems, CharLES is designed to tackle fluid dynamics challenges, predicting accurately traditionally complex problems for CFD in aeroacoustics, aerodynamics, combustion, heat transfer and multiphase. CharLES has been optimized to consume as little memory as possible and can be scaled linearly to hundreds of GPUs across dozens of nodes.

Tests of the CharLES showed total simulation time and costs were substantially decreased—engine simulations were completed in a matter of hours and days rather than weeks. Powers credits this achievement to using emerging, high-performance, computing hardware on GPUs.

"This capability to rapidly and reliably simulate multiple designs—and to correctly understand design directional trends at realistic conditions—can and already has supplemented flight test results," said Computational Fluid Dynamics and Noise Branch Lead Michael Smith.

"It's a tool that supports early trade studies, initial detailed designs and system redesign/retrofit efforts related to gas

Navy's Future Vertical Lift (Maritime Strike) Passes Key Milestone

U.S. Navy photo by MCSS Riley McDowell

An MH-60R helicopter attached to the "Spartans" of Helicopter Maritime Strike Squadron (HSM) 70, embarked on the USS Gerald R. Ford (CVN 78), hovers over the fantail of the guided-missile destroyer USS Arleigh Burke (DDG 51)

U.S. Marine Corps photo by Lance Cpl. Koby I. Saunders

Sailors assigned to USS George H.W. Bush (CVN 77) test a jet engine cell on the ship's fantail. CharLES is reducing the time and cost it takes to simulate the aerodynamics inside an aircraft's engine and troubleshoot problems.

turbine engine design and integration in a way that captures the complex turbulence critical to improved engine design/analysis," Smith said.

The work to improve CharLES and expand its use continues. The Computational Fluid Dynamics and Noise Branch plans to continue licensing the software via a cost-sharing program with DoD High Performance Computing Modernization Program (HPCMP) and is exploring further development at Cadence Design Systems. In addition, NAWCAD is using a DoD HPCMP Frontier project for significant computational allocations to enable transient, full-engine simulations using CharLES. Frontier projects receive additional assistance from the entire HPCMP ecosystem (DSRCs, user support, software development, PET and networking) throughout their development processes.

The concept behind CharLES is a powerful one with other potential uses.

"The software is expanding the practical application of LES to a broad range of engineering applications beyond aerospace—to include automotive and turbomachinery as well," Powers said. "I also believe the use of an efficient, accurate, high-fidelity, simulation software in a production environment would prove to be a disruptive, game-changing technology in NAWCAD and across aeronautics."

From the Naval Air Systems Command (NAVAIR) Small Business Innovation Research/Small Business Technology Transfer.

PATUXENT RIVER, Md.—The Navy's Future Vertical Lift (Maritime Strike) (FVL (MS)) program recently completed its Analysis of Alternatives (AoA), culminating in a Deputy Chief of Naval Operations (DCNO) for Warfighting Requirements and Capabilities (N9) "Gate 2" Resources and Requirements Review Board (R3B). The board unanimously endorsed the results of the AoA and directed the program to proceed with the development of a Capabilities Development Document (CDD) and a Concept of Operations (CONOPS).

The Navy's legacy helicopter fleet of MH-60R and MH-60S Seahawks will begin to reach the end of their service lives in the late 2030s, following Service Life Extensions for both aircraft. FVL (MS) provides the Navy with the opportunity to transition the existing legacy fleet to a more capable platform required to operate in a Distributed Maritime Operations concept.

Rear Adm. Buzz Donnelly, Director, Air Warfare Division, N98, Office of the Chief of Naval Operations, said, "FVL (MS) will be the most widely distributed aviation platform in the Navy embarking on all surface combatants from future FFG to aircraft carriers and will contribute to more primary mission areas than any other aviation platform in the Navy."

FVL (MS) is envisioned as a crewed and uncrewed Family of Systems (FoS) that will perform the missions that legacy helicopters perform today, but with greater ranges, endurance and modularity to capitalize on emerging technologies. The FoS will be developed under the same Program Executive Office (PEO) to maximize interoperability, including crewed/uncrewed teaming. The FVL (MS) FoS will be more capable, survivable, reliable and sustainable.

The Navy's Future Vertical Lift (Maritime Strike) is being developed to perform unique maritime missions and operating primarily from Surface Combatants (DDGs, FFGs, LCS); FVL (MS) will leverage many Army FVL and Marine Corps vertical take-off and landing (VTOL) FoS efforts. The program is informed by the Army and Marine Corps advances in improved engine design, digital backbone, Modular Open Systems Architecture (MOSA), advanced rotor blades, materials and launched effects.

While working toward a materiel solution and working toward an initial operational capability (IOC) in the early 2040s, OPNAV N98 and Naval Air Systems Command will hold an Industry Day in 2024 to relay requirements for FVL (MS) capabilities and to share concept of employment (CONEMPS) details.

From the H-60 Multi-Mission Helicopters Program Office.

NAWCAD Lakehurst Works to Improve Flight Deck Safety with NOCTRNAL Research

U.S. Navy photo

The Night Operations Character Transcription & Recognition for Naval Aircraft Logistics (NOCTRNAL) team is developing an algorithm to recognize aircraft side numbers, which would help ship personnel locate everything on a flight deck without relying on human capital.

JOINT BASE MCGUIRE-DIX-LAKEHURST, N.J.—Research spearheaded by a team at Naval Air Warfare Center Aircraft Division Lakehurst, looking at ways to improve deck safety on a ship while freeing up Sailors to do other more critical jobs, received Naval Innovative, Science and Engineering (NISE) funding.

The Night Operations Character Transcription & Recognition for Naval Aircraft Logistics (NOCTRNAL) team is developing an algorithm to recognize aircraft side numbers, which would help ship personnel locate everything on a flight deck without relying on human capital.

Project lead Dr. Todd Morehouse said the idea to automate asset tracking on the flight deck came directly from the fleet and is

Naval Test Pilot School Students Evaluate Orion Handling Qualities at NASA

HOUSTON, Texas—As part of a technical exchange with NASA's Johnson Space Center in Houston, Texas, 24 test pilots under instruction from the Naval Air Warfare Center Aircraft Division's (NAWCAD) U.S. Naval Test Pilot School (USNTPS) were invited to spend a week at NASA to evaluate the Orion spacecraft controls and displays during orbital maneuvering and re-entry procedures. The Johnson Space Center is where astronauts primarily train for their missions to space.

The technical exchange is a two-week segment of the intense, 11-month USNTPS curriculum that gives students exposure to other agencies, governments and organizations that perform flight tests at different classifications and technology levels. This year, students spent one week of that exchange experience at NASA.

"Test Pilot School teaches students not only how to test aircraft, but any system, software or vehicle for any potential missions," said Cmdr. Jeffrey Webb, fixed-wing flight instructor at USNTPS. "The evaluation of the Orion spacecraft gave them an opportunity to broaden their experience and think about flight testing in an unfamiliar system, performing unfamiliar tasks, to accomplish an unfamiliar mission."

Capt. Adam Klein is Chief Test Pilot for NAWCAD's Atlantic Test Ranges (ATR) at Patuxent River, Maryland. He is also a fixed wing flight instructor at USNTPS and is employed by NASA as a research pilot. He temporarily stepped away from his NASA duties when he was recalled to active duty at ATR and USNTPS supporting his Navy Reserve status.

"Our students performed a simulated hand-flown, manual re-entry into the Earth's atmosphere after a return trajectory from the moon," said Klein, who explained this was the first time USNTPS students were given such a dynamic Orion test by NASA.

"The students were asked to evaluate the human-machine interface of Orion while attempting to capture and maintain very specific flight parameters such as vehicle pitch, roll and yaw, all while preserving maneuvering fuel in an attempt to successfully splashdown in the Pacific Ocean off the coast of California."

According to Klein, NASA uses an in-house team of engineers in a Rapid Prototyping Laboratory (RPL) to develop the interface for their spacecraft. The engineers at the RPL get a set of high-level requirements for a control or a display of a spacecraft, then conduct rapid prototyping either through 3D printing of hardware or the generation of software, followed by evaluation of their design by astronauts.

part of a larger research effort at Lakehurst to revolutionize aircraft tracking on the flight deck. Last year, Lakehurst's Panoramic Tracking of Real-time Information for the Ouija Tabletop (PATRIOT) team received the NISE Outstanding Project Award for their work using cameras and artificial intelligence to auto-populate the Ouija board. Morehouse noted that NOCTRNAL is one project that falls under the much larger PATRIOT research umbrella.

"The goal of the PATRIOT system is to increase and automate situational awareness of all the activity occurring on flight decks," Morehouse said. "The capability being researched as part of NOCTRNAL fits perfectly within that goal by providing that fine-grain tail number information. With that information, the overall accuracy of the system improves, and consequently its usefulness to the Sailors."

Morehouse said NOCTRNAL has three main components: Aircraft object detection; A pan-tilt-zoom camera; and Optical Character Recognition (OCR) to identify aircraft on the flight deck.

The aircraft object detection uses machine learning to identify aircraft, while the program's cameras use optical and thermal sensors to identify aircraft at night or during inclement weather.

"This is not only automating the process for the Sailors so they can focus on other tasks, but it's also improving reliability when conditions are difficult or when the Sailors are overloaded with many tasks at once," Morehouse said.

The team is currently looking at algorithms and the best way to integrate the data into one package that can be used for future testing. Morehouse said his group had originally applied for funding through the Department of Defense's Innovation Challenge but was not one of the programs chosen. However, he said the NISE funding validates the importance of their work.

"I think they saw the need for this project. It's something that's necessary to integrate PATRIOT into the Marine Aviation Data Management System (MADAMS), so they followed up and said we still want to fund this for the remainder of the year, and we are looking to have it funded for next year as well," Morehouse said.

Having only started working at Lakehurst in November 2023, Morehouse said this has been a unique first project to work on.

"Working for defense contractors or academia, everyone has the same goal: everybody really enjoys seeing the product transition and helping it reach the fleet or wherever it's going," Morehouse said. "It's cool being here, where we can be in between and focus on helping the warfighter."

From Naval Air Surface Warfare Center, Lakehurst, New Jersey.

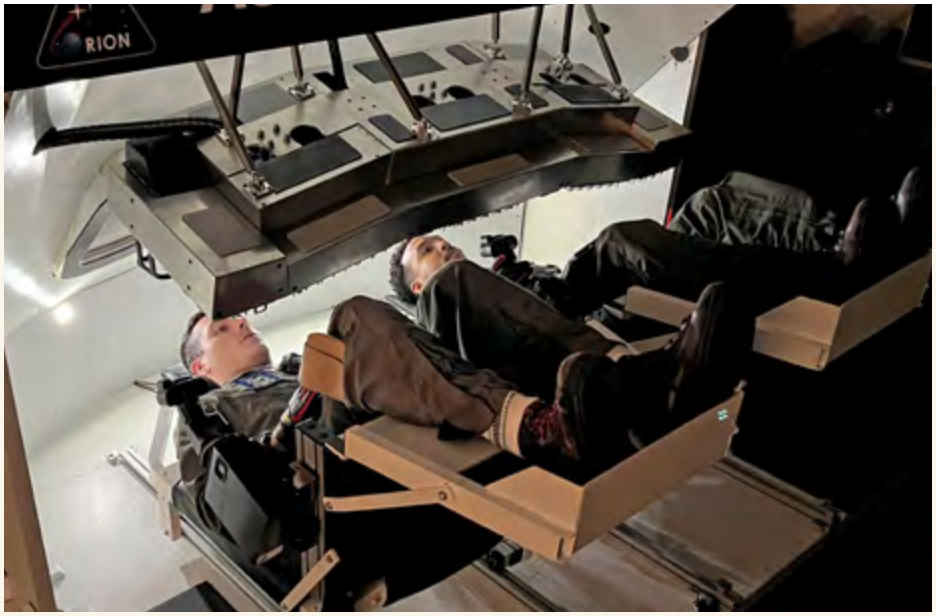
According to Webb, the students provided feedback to the RPL relating to the accuracy and precision with which they were able to capture re-entry orientation, refine their landing zone and complete terminal maneuvers prior to splashdown.

"This gives the RPL immediate feedback to make necessary changes before moving on to the next design task," Klein said.

Only when the design is finalized is it then sent to the vendor to make flight-ready hardware and software for the aircraft.

"NASA routinely invites USNTPS to return," Klein said. "They get valuable feedback from a unique perspective since not all astronauts have a test pilot background."

Some of the feedback from USNTPS students over the years has actually been integrated into design changes for the Orion spacecraft that will be bringing humans back to the moon as part of the Artemis campaign.



U.S. Navy photo

U.S. Naval Test Pilot School students Lt. Nathaniel Kruder and Lt. Guy Williams evaluate the human-machine interface of the Orion spacecraft for NASA while attempting to capture and maintain very specific flight parameters. The tests were part of a technical exchange for USNTPS students at NASA's Johnson Space Center in Houston, Texas.

USNTPS is a component of Naval Test Wing Atlantic, test wing under the Naval Air Warfare Center Aircraft Division, located at Naval Air Station Patuxent River, Maryland.

Written by Brittany Dickerson, public affairs specialist with Naval Air Warfare Center Aircraft Division.

U.S. Navy photo by Vicky Falcon

An oil painting by George F. McWilliams restored by the Patuxent River Naval Air Museum hangs in the museum's Test & Evaluation Hall.

Navy test pilot school mural raised from ruin at the Patuxent River Naval Air Museum

PATUXENT RIVER, Md.—A mural that once held pride of place on the lobby wall of the now-demolished Officer's Club at Naval Air Station (NAS) Patuxent River will once again be a focal point, this time for visitors at the Patuxent River Naval Air Museum in Lexington Park, Maryland.

The mural, an oil-on-canvas painting by George F. McWilliams, represents NAS Patuxent River's role in national space history—particularly, the role of the U.S. Naval Test Pilot School (USNTPS), its graduates and its long-standing relationship with NASA.

In 2015, Pax River's Officer's Club—along with its remaining furnishings—had been long closed and headed to demolition. Knowing its fate, then USNTPS Commanding Officer Lt. Col. Tim Davis and USNTPS Technical Director John Hardison went looking for the painting.

"The building had been closed up and had fallen into serious disrepair," Hardison said. "There were roof leaks and mold everywhere. Literally one-third of the mural had detached from the wall, held up by the portion that was still adhered to the wall."

Davis is no longer at USNTPS, but is an instructor and scientist for Johns Hopkins University Applied Physics Laboratory in California, Maryland.

"I thought it would be terrible if it got thrown away or destroyed," Davis said.

Since he had a contact at the Pax River Naval Air Museum, he connected with them to take on the restoration project.

According to Courtney Stanley, communications specialist for the museum, the mural underwent significant restoration work due to exposure from years of wear, grime and various airborne particles.

"The panels and support structures for the mural were constructed by JF Taylor Company," Stanley said. "Our conservator team will attach the restored panels, which now have a lifespan of at least 100 years."

Once attached, the panels will be raised high into the spaces of the museum's Test & Evaluation Hall.

"It's important that we don't lose the history of Pax and all the test pilots who were here," Davis said. "I vividly remember seeing the mural above the entry doors at the Officer's Club and now we get to see that part of our history at the museum."

McWilliams is a Southern Maryland native who currently resides in West Virginia. He worked as a graphic artist for the U.S. Naval Air Test Center, now the Naval Air Warfare Center Aircraft Division (NAWCAD).

USNTPS has produced nearly 100 astronauts including Wally Schirra, Alan Shepard, Jim Lovell, John Glenn, Charles Bolden and many more, including four crew members currently aboard the International Space Station. USNTPS is a component of Naval Test Wing Atlantic, the test wing under NAWCAD, located at NAS Patuxent River, Maryland.

Written by NAWCAD Visual Information.

Grampaw Pettibone

Gramps from Yesteryear: January-February 2005

Illustration by Ted Wilbur

Thing that goes bump in the night

Night Belly Whopper

A lieutenant commander instructor pilot and his ensign replacement pilot (RP) briefed for the new pilot's first night training flight in an E-2 Hawkeye. A complete brief was conducted, the aircraft was signed for and preflight performed. The Hawkeye launched from home plate and proceeded to a nearby airfield. The RP was in the left seat, the instructor in the right.

Nearing the vicinity of the airfield, a tactical air navigation approach was conducted. Following the approach, the E-2 was cleared into the night visual flight rules landing pattern. Eleven approaches were flown with various flap configurations: full, two-thirds, one-third and none. Of these, eight were terminated with touch-and-go landings.

Approximately one hour after takeoff and still in the pattern, the aircraft reported the abeam position with three down and locked for a touch-and-go, with the port engine simulated out. This pass was completed as a simulated single-engine landing with a takeoff using power on both engines.

Following this approach another single-engine approach was flown to a touch-and-go landing. Liftoff was accomplished with one engine simulated feathered to emulate a single-engine bolter (the procedures for a single-engine waveoff or bolter are identical). After performing the proper procedures, a single-engine climb was accomplished and the E-2 commenced a turn downwind for another simulated single-engine approach. Abeam the runway, the E-2 reported, "Three down and locked, touch-and-go."

During the approach, a jet in the pattern, also conducting touch-and-go operations, distracted both pilots. The single-engine approach was flown fast and the instructor noted the aircraft tended to float in close.

As the Hawkeye neared the touchdown point, the instructor added power to the starboard engine (simulated feathered) and told the RP, "Take both engines and let's go."

Immediately an explosion was noted in the starboard engine. The RP reacted by reducing power in order to keep the aircraft on the runway. The starboard propeller contacted the runway, followed immediately by the port propeller. The aircraft had landed gear up on the centerline, approximately 2,500 feet down the runway, and departed it to the left.

The plane came to a stop left of the runway, a little past midfield. The starboard side of the E-2 was in flames as the pilots exited via the overhead hatch. The aircraft sustained substantial damage. The instructor was not wearing flight gloves and suffered minor burns on his hands.

Grampaw Pettibone says...

My achin' ulcers! With all the emphasis on safety and NATOPS in this day and age, we still have those few drivers who don't listen. There are a multitude of old excuses (I was distracted by the jet, etc.) but no new ones.

Would you believe we had a wheels watch posted in this case? He was worse than the pilots. He saw the machine with its wheels up but never fired his flare gun.

I've said it at least a thousand times in the past: Use a checklist! It proves an "aircraft-back guarantee." And it's free!

Marine One, BUNO 358, on display at the new George H. W. Bush Presidential Museum and Library Marine One/4141 Locomotive Pavilion in College Station, Texas. The new pavilion showcasing the retired Marine One helicopter hosted a Day of Gratitude and an invitation-only Centennial Celebration Dinner in the new 29,000 square-foot pavilion as part of the 41@100 event on what would have been President George H. W. Bush's 100th birthday.

U. S. Navy photo by Megan Wasel

Retired Marine One Makes a Memorable Final Stop

By Megan Wasel

A retired, de-militarized and restored VH-3D Marine One was inducted into the George H. W. Bush Presidential Library and Museum, College Station, Texas in June. The library and museum, located within the Texas A&M University campus, welcomed Presidential Helicopters Program Office members, Bush family members, donors and supporters to the grand opening of a new pavilion that now houses the retired Marine One.

Bureau number 159358 (BUNO 358) served United States presidents beginning with the Ford administration. The VH-3D was sent to Marine Helicopter Squadron One (HMX-1) in 1976, flew roughly 12,100 hours and was returned to the program office's Presidential Helicopter Support Facility (PHSF) at Naval Air Station Patuxent River, Maryland, in 2023 for its end of service life.

Retiring a Flying Legacy

When BUNO 358 was nearing its end of service flight hours, the program office began reaching out to Department of the Navy and National Museum of the Marine Corps stakeholders regarding disposition options for a retired Marine One helicopter.

The George & Barbara Bush Foundation and the George H. W. Bush Presidential Library and Museum were in the process of expanding its current facility footprint by adding an extension to draw more visibility and increase attendance to the museum. The plan was to house the retired and donated 4141 Union Pacific presidential locomotive, add in a café, and use the space for functions. As luck would have it, the foundation's new facility also had room for the retired BUNO 358. The locomotive and helicopter both transported President Geroge H. W. Bush in his many years of service as the 43rd vice president and as the 41st president.

The Presidential Helicopters program office team worked a detailed schedule in preparation for the helicopter's de-militarization and transport. The helicopter went through a process like many other retiring aircraft to include top shelf inspection, maintenance, testing and white-glove care. A retired aircraft must be able to sustain all

types of weather, elements, temperatures, conditions, and even being transported to and from locations inside other aircraft or on a flatbed.

Preparing a helicopter for retired life takes a team of experienced government and contract professionals. The de-militarization process for BUNO 358 began March 2023. This grand effort consisting of employees from the program office, VTG, and Clayton International—the small business tasked to preserve and transport the retired helicopter—had hundreds of combined man-years of experience in aviation maintenance and extensive VH-3D hands on experience.

"This was no easy effort, the joint team worked hard to coordinate and prepare the retired and restored helicopter for its final resting place at the George H. W. Bush Presidential Library and Museum."

Months of strategic planning and coordination between all the entities culminated in early February when BUNO 358 was ready to make its cross-country trip to its final resting place.

Presidential Helicopter program office sustainment lead Todd Humiston said, "This was an incredibly rewarding effort that was executed by professionalism up

Photo courtesy of the George & Barbara Bush Foundation

Presidential Helicopter Executive Lift Mission and History

The use of the presidential helicopter can be traced back to 1957 when then President Dwight D. Eisenhower first found this mode of transportation essential to get quickly from his current location to the White House. Since then, the importance, speed and practicality of using a helicopter became a routine mode of transportation for all future United States presidents.

Photo courtesy of George H.W. Bush Presidential Library and Museum

President George H.W. Bush and First Lady Barbara Bush arrive on the White House South Lawn from Camp David on Nov. 8, 1992.

The presidential helicopter has evolved since the late 1950s with the first variant being the UH-13J Sioux, then the UH-34 Seahorse. The H-34 replaced the H-13, and by the early 1960s, the VH-3 was introduced. In 1978, the VH-3D entered presidential transport service and in 1987 the VH-60N joined the fleet serving alongside VH-3D to fill out the fleet of presidential and executive lift transport.

HMX-1, while established in 1947 as an experimental test and evaluation unit during the initial years of rotary wing flight, became the squadron to fly the president in 1957. That was because then-President Dwight D. Eisenhower—away on vacation—was urgently needed back at the White House. What would have been a two-hour motorcade trip was reduced to a seven-minute helicopter ride. On that day, HMX-1 earned its most prestigious of missions—direct support of the president. Now, when the president is aboard the HMX-1 piloted ever-reliable Sikorsky VH-3D helicopter, it takes on the name Marine One.

When Bush began use of the executive transport, a VH-3D already in the presidential lift mission since President Gerald R. Ford's administration was called upon. BUNO 358 carried presidents and heads of state until the helicopter was decommissioned in early 2023.

Marine One, BUNO 358, wrapped for transport by Clayton International, arrives in College Station, Texas, in February with police escort. A skilled team relocated the aircraft, which is on permanent loan from the National Museum of the Marine Corps.

and down the chain of command, from the scheduling of all the tasks, demilitarization, transportation, disassembly, reassembly, transportation across the country, the offloading of the aircraft and finally the placing of the aircraft within the museum."

VTG provided their expert team to ensure the utmost care and consideration went into every detail of the de-militarized aircraft. The integrity of the executive interiors was expertly maintained, and all the helicopter's parts removed in such a manner as to be replaced with non-serviceable components, displays or covered to give the appearance of a functional cockpit, cabin and exterior.

After the demilitarization process was complete and the aircraft was found to be suitable after inspection, and transported to Clayton International, which was responsible for loading the aircraft on a trailer and then transporting it to its Maintenance Repair and Overhaul facility in Georgia.

Clayton International is an expert in aircraft relocation. Once in Clayton's possession, they completed the intensive restoration and reassembly process along with museum preparations and safety/compliance. This effort included sourcing, cleaning and the reinstallation of executive interior panels, seating, carpeting, even repopulating the cockpit instruments, gauges, controls as they were during the 41st president's use of the helicopter. Clayton also installed essential dynamic components and did a complete exterior paint before its final transport and relocation to College Station, Texas. On Feb. 27, the retired Marine One, BUNO 358, arrived in College Station, Texas with a police escort motorcade.

Once on site, Clayton completed the offload, reassembly, positioning, and final clean for museum display and lighting.

As for long term sustainment of the helicopter, as it is no longer in flying condition, the National Museum of the Marine Corps will upkeep as necessary.

"This was no easy effort," said Col. Alex Ramthun, program manager. "The joint team worked hard to coordinate and prepare the retired and restored helicopter for its final resting place at the George H. W. Bush Presidential Library and Museum."

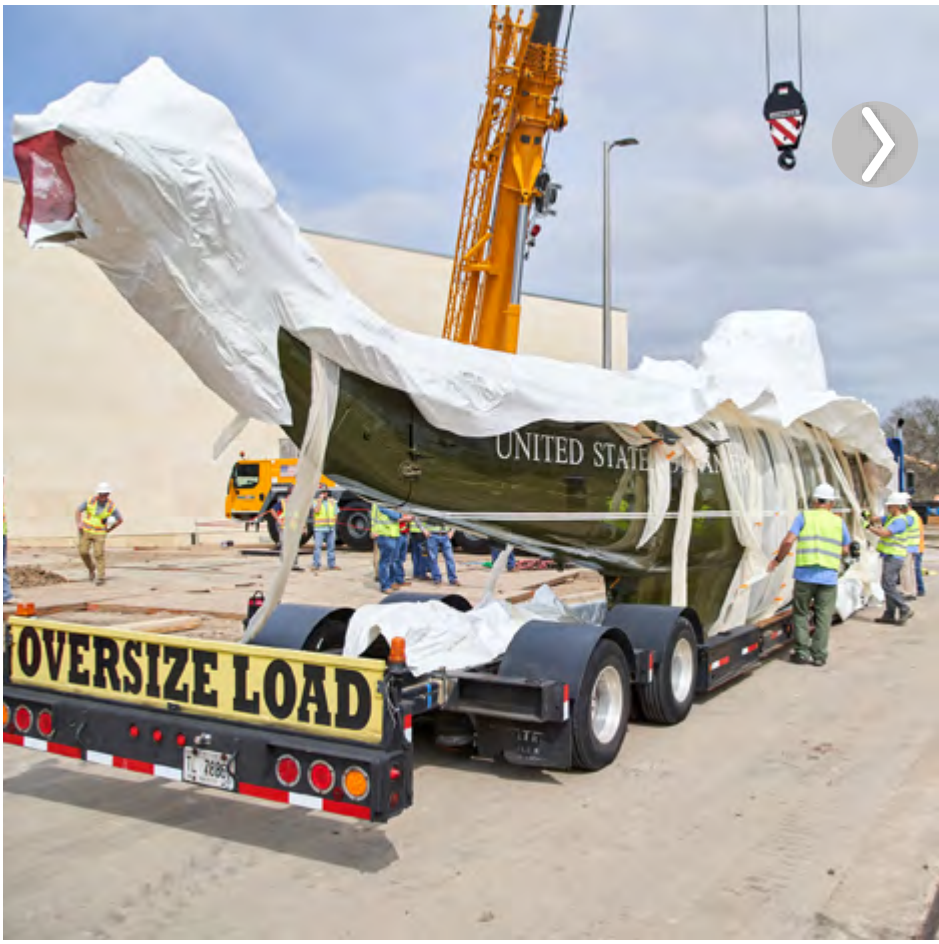


Photo courtesy of the George & Barbara Bush Foundation

Marine One, BUNO 358, arrives in College Station, Texas, in February. The 72-foot-long helicopter was transported by flatbed over two days and is estimated to weigh 4.65 tons.

Photo courtesy of the George & Barbara Bush Foundation

Marine One BUNO 358 arrives in College Station, Texas, in February. A skilled team relocated the aircraft, which is on permanent loan from the National Museum of the Marine Corps.

Photo courtesy of the George & Barbara Bush Foundation

In February, the retired, demilitarized and restored Maine One, BUNO 358, was placed inside the pavilion. At that time, the new Marine One/4141 Locomotive Pavilion was still being finalized as it waited for the arrival of the presidential helicopter.

Final Resting Place

On the evening of June 12, on what would have been President George H. W. Bush's 100th birthday, in the presence of the Bush family, George and Barbara Bush Foundation CEO Andrew H. Card Jr., and hundreds of donors, the preserved Marine One was unveiled in the new pavilion. The VH-3D Marine One was the backdrop for the evening's remarks, singing and recognition to the many who made this historic moment all possible.

On June 13, the campus of Texas A&M and the George and Barbara Bush Foundation, and George H. W. Bush Presidential Library and Museum opened the building to the public for the first time.

Thousands of excited patrons, donors, college alum and more passed through the doors to view the VH-3D, read its displays and learn more about the aircraft's important part of the 41st president's history.

"We are proud of be part of this legacy and I am proud to work alongside these talented individuals who constantly impress me with their dedication to this no-fail mission," Ramthun said.

The Future of Presidential Lift

The venerable VH-3D and VH-60N Marine One helicopters have not stopped their rigorous mission to safely transport the president and heads of state to places near and far. These rugged yet very-reliable and secure aircraft have a meticulous maintenance protocol. Aircraft come in for white glove maintenance and testing then put back into service without missing a scheduled mission.

But all aircraft have a service life and the VH-3D and VH-60N are closing in on their end of mission. Additionally, over time requirements change, capabilities advance and develop, and customer needs change. In May 2014, the program office—the acquisition arm of the helicopter's mission—with approval from the Navy, awarded Sikorsky Aircraft a contract to build the next presidential helicopter, the VH-92A, a derivative of the commercial S-92. The VH-92A Patriot, with 23 aircraft in its program of record, is nearing the end of production. The VH-92A is in the midst of a phased plan to ensure a smooth, safe and timely transition from the legacy VH-3D and VH-60N aircraft.

Megan Wasel is a public affairs officer with the Presidential Helicopters Program Office.

U.S. Navy photo by Megan Wasel

Retired, demilitarized and restored Marine One, BUNO 358, on display inside the new Marine One/4141 Locomotive Pavilion in College Station, Texas.

U.S. Navy photo by Megan Wasel

Union Pacific Railroad 4141 locomotive was used by the 41st president throughout his career. The 4141 locomotive is most known for transporting President Bush to his final resting place in College Station, Texas. 4141 is on display at the new George H. W. Bush Presidential Museum and Library Marine One/4141 Locomotive Pavilion.

U.S. Navy photo by Megan Wasel

Marine One, BUNO 358, on display at the new George H. W. Bush Presidential Museum and Library Marine One/4141 Locomotive Pavilion in College Station, Texas. The new pavilion showcasing the retired Marine One helicopter hosted a Day of Gratitude and an invitation-only Centennial Celebration Dinner in the new 29,000 square-foot pavilion as part of the 41@100 event on what would have been President George H. W. Bush's 100th birthday.

U.S. Navy photo by Megan Wasel

Retired Marine One, BUNO 358, was the backdrop for President George W. Bush, the 43rd president of the United States, who spoke at the invite-only June 12 Centennial Celebration Dinner inside the new Marine One/4141 Locomotive Pavilion on what would have been his father's 100th birthday.

U.S. Navy photo by Megan Wasel

Union Pacific Railroad 4141 locomotive was one of the centerpieces at the invitation-only June 12 Centennial Celebration Dinner inside the new George H. W. Bush Presidential Museum and Library Marine One/4141 Locomotive Pavilion.

Local 'Rosie Riveter' Visits B-25 at U.S. Naval Test Pilot School

By Naval Air Warfare Center Aircraft Division Visual Information

Betty Jean Holly celebrated her 99th birthday just two days after the 80th anniversary of the allied landings on D-Day.

During a recent visit to the U.S. Naval Test Pilot School (USNTPS), she fondly recalled working in a Kansas City factory in 1943 as a riveter building B-25 Mitchell Bombers. The B-25 was a medium bomber aircraft manufactured by North American Aviation that was used by the U.S. in every theater of World War II.

"I graduated from school when I was 17 but couldn't work at the factory until I turned 18," said Holly, "But as soon as I turned 18, I moved away from home and started working."

Holly shared her story while visiting Naval Air Station (NAS) Patuxent River, Maryland, where she had an opportunity to see a B-25 up close at the schoolhouse.

"You did a great job on those rivets as they've held up for more than 80 years," said Larry Kelley, Executive Director of the Delaware Aviation Museum Foundation and owner of the B-25 named "Panchito." Panchito flies in from Delaware twice each year to train USNTPS test pilots under instruction.

It was during one of those training flights in June that Southern Maryland local James Marsh saw the B-25 and thought of his wife's grandmother. Marsh is a retired engineer who lives in California, Maryland, and enjoys playing a round or two of golf on the base course.

What Marsh saw was a large, shiny, silver propellered plane with two vertical stabilizers on the rear, an all-glass nose, and glass turret on top. The two radial piston engines are part of what makes the B-25 a truly unique aircraft for USNTPS students to fly, land and taxi on the runway.

"We're very proud to have a small part in helping the school develop the world's finest test pilots," Kelley said. "They understand that learning from the past helps teach modern techniques for future flight test."

Marsh said it was an amazing aircraft to see land at the base. "And I knew Betty had helped build them."

Marsh contacted USNTPS and the school invited Holly and her family to come see the plane on the flight line outside the school's hangar.

"This is absolutely incredible," said Holly, sitting in the shade of the wing panels she may have helped build. "I never expected this opportunity and I'm so grateful."

Holly shared how she left her rural Kansas home with a friend to move near Kansas City for the job with North American Aviation. The two girls worked 12-hour shifts, six days each week.

"My mother said I was only allowed to work there if I did the night shift," said Holly, who laughingly said her mom thought working nights would keep her out of trouble. "She was afraid I'd go to bars."

"We had two 30-minute breaks when we ate lunch," Holly said. "The conveyor belt would stop and we would all just sit down on the floor and take a break."

According to Holly, the only safety requirement was that they could not wear sweaters, as the yarn could get caught on the machinery.

Though sweaters were a safety risk, modern considerations like hearing protection were not a concern on the loud factory floor.

"I liked working there," she said. "It was interesting work and fun."

Holly said aside from the breaks, they stood for the entire shift facing a partner as the wing portions came through hanging from a conveyor belt.

"One of us drilled the holes and pushed the rivet in while the other held the 'bucking bar,'" she said.

A bucking bar is a hand-held anvil used to form the end of a rivet.

"Every four hours we would switch positions as drilling and riveting were harder efforts."

The factory was also historically significant from an integration perspec-

The B-25J Mitchell "Panchito," owned by Larry Kelley and housed at the Delaware Aviation Museum, conducted qualitative evaluation exercises with the U.S. Navy Test Pilot School Class 149 at Naval Air Station Patuxent River in 2016. U.S. Navy photo by AE1 Alicia Glende

U.S. Navy photo by Vicky Falcon

Betty Jean Holly, a real-life Rosie Riveter, poses with a World War II era B-25 bomber on the flight line at the U.S. Naval Test Pilot School in Patuxent River, Maryland on June 4.

tive. An Executive Order by President Franklin D. Roosevelt in 1941 banned discrimination of workers in defense industries and government because of race, creed or color. While working at the factory, Holly said she met the first person of color she had ever seen.

Holly remembers "war" being a major part of her youth.

"I grew up with war," she said.

Almost all of the young men she knew from her small town were drafted and she felt it was part of her patriotic duty to serve in some capacity—and the factory provided her with an opportunity for independence.

"I was just happy to get away from home," she said. "My first paycheck was for $.49/hour."

Though there is really no way to tell if Holly's rivets are onboard Panchito, it is a distinct possibility.

"We often scratched our initials on the inside panels," she said.

Kelley and his crew have seen many B-25 wing parts in their role at the museum and can verify that many of the women who were riveters left their mark.

"We've seen hearts and initials and other messages scratched into the metal," he said. "Perhaps someday we'll see the inside of Panchito and be able to see if Betty's initials are there."

USNTPS trains pilots and engineers for development test and evaluation of aircraft and aircraft systems. USNTPS is a component of Naval Test Wing Atlantic, the developmental test wing under the Naval Air Warfare Center Aircraft Division (NAWCAD) in Patuxent River, Maryland. NAWCAD advances capability and operational readiness for Naval Aviation.

Written by Naval Air Warfare Center Aircraft Division Visual Information.

Symphony in Motion: PTMO Marks

By Kimberly Brown

A BQM-177 subscale, high-subsonic aerial target launched this April in support of operations at Naval Air Warfare Center Weapons Division's China Lake Range (CLR) in California, but it was not just any launch. It was No. 200 for the Pacific Target and Marine Operations team.

It was also a massive endeavor requiring a huge cross-site, cross-functional coordination challenge—a symphony working together in harmony. And if this test event was a symphony, the test managers were the conductors.

"Test managers at the China Lake Range orchestrated the integration of multiple complex resources into a unified event execution," said Laura Paganucci, CLR's chief operating officer. She said it took meticulous planning and seamless collaboration among teams from across NAWCWD at both China Lake and Point Mugu, California.

"In intricate test scenarios like those involving BQMs, teamwork is essential in ensuring a smooth and successful event," she said.

The event itself—presenting BQM-177 targets for a live-fire event—resulted in an 11-minute flight, but it took weeks to plan. And continuing the symphony metaphor, there are several "first chair" experts making the music, experts like Operations Conductor Abby White, who explained that coordinating range dates, equipment inspections and logistical considerations—the targets involved "live" in Point Mugu, nearly 200 miles away from CLR—as well as mission planning and range safety reviews are all critical.

"As an OC, you are responsible for the success of the operation, but first and foremost is the safety in the execution," White said.

Flight planning, hazard analysis, mitigation controls and close, constant communication are just the starting point, and when it's time to perform, the whole orchestra must be on the beat.

The remote control operator is sending commands from a control room, and will fly the target during the exercise, but the BQM-177 on the launch pad requires on-site preparation and operational checks. The Direct Control Officer and pad crew on site verify that the commands are received and loads any ordnance—in this case rocket-assisted take-offs.

Once the target is launched and flying, if any anomalies arise, it is up to the operations conductor to make split-second decisions on how to overcome them. That sort of responsibility requires a lot of training. White, with a full two years of experience as an operations conductor, is still considered to be "under instruction," working with her trainer, Nick Yniguez, every step of the way.

The 200th flight went smoothly, without a sour note. That's unsurprising, said Kevin Gross, the Threat Target Systems Department head.

"This is a great, knowledgeable team, all operating toward a single goal: supporting the warfighter and delivering capabilities to the fleet," he said. "They exemplify the open communication, collaboration and trust in one another that we know makes teams better, more effective, and ultimately successful in everything they do."

Kimberly Brown is a public affairs officer with Naval Air Surface Warfare Center Weapons Division, China Lake, California.

U.S. Navy photo

The Pacific Target and Marine Operations division launched its 200th BQM-177 flight on April 2 from China Lake.

Milestone 200th BQM-177 Launch

U.S. Navy photo by Jessica Nilsson

JASMMM Course Supplies Vital Training to Aviation Supply, Maintenance Professionals

By Lt. Cmdr. John Kamensky

The Joint Aviation Supply and Maintenance Material Management (JASMMM) course, home-based and facilitated by the Navy Supply Corps School (NSCS) in Newport, Rhode Island, covers advanced aviation logistics management procedures and processes. The target audience for the course is Naval Aviation maintenance and supply personnel ranked E-6 and above. While most students are active duty Sailors or Marines, there is no specific service or duty type requirement.

Joint Aviation Supply and Maintenance Material Management (JASMMM) instructor LSC Carla Palad provides students details about their upcoming group assignment.

"One of the most important reasons I attended the JASMMM course was to learn the most up-to-date policies, procedures and best practices relevant to ensuring logistics effectiveness during an upcoming deployment," said Lt. Cmdr. Gilbert Garcia, Maintenance Officer, or "CAGMO," with Carrier Air Wing (CVW) 8 said. "Additionally, it was an opportunity for the Supply and AIMD [Aircraft Intermediate Maintenance Department] team of the USS Gerald R. Ford (CVN 78) and CVW-8 to share successes and challenges we collectively encountered during our most recent deployment. The great thing I enjoyed about the class is the experiences shared and the ability to work together in teams just as we would in real world operations. The JASMMM instructors provided knowledgeable insight into current and future policies and changes, and all students who attended will have invaluable tools as they continue their logistics journeys."

The JASMMM instructor team is composed of Lt. Cmdr. John Kamensky, a Professional Aviation Maintenance Officer; Chief Petty Officer AZC Christopher Allen, an Aviation Maintenance Administrationman; and LSC Maan Carla Palad, a Logistics Specialist Chief Petty Officer with extensive aviation supply experience. The instructor team currently has one civilian vacancy who would serve as the team's second aviation supply subject matter expert.

Since the start of 2024, the JASMMM instructor team has traveled to three fleet concentration areas—Jacksonville, Florida, San Diego, California, and Atsugi, Japan—bringing its in-depth knowledge

"The JASMMM course is vital for our supply and maintenance folks, because the curriculum helps strengthen an important core competency: the ability to build relationships. In our business, relationships are everything."

of Naval Aviation maintenance and supply concepts to those who, for various reasons, are unable to attend the course in Newport, Rhode Island.

The Mobile Training Team (MTT) courses conducted so far in 2024 have reached 95 students—59 percent from aviation maintenance disciplines and 41 percent from aviation supply disciplines.

Ultimately, the quality of MTT events hinges upon coordination with points of contact in the local area who schedule the training location and determine facility requirements needed to conduct the course of instruction. Lt. Cmdr. Eric DuBois, Lt. Cmdr. Adam Clay and Lt. Matthew Carbonel and Lt. Mark Nintrup were instrumental in the success of JASMMM events in their respective fleet concentration areas. Mobile events give course access to students who may otherwise be unable to attend due to travel funding shortfalls. Instead, local units provide travel funds for the JASMMM team's visit, instead of funding student travel to Newport to attend a resident course. In total, the three MTT events have resulted in travel cost savings of $266,600 and counting.

MTT events also attract senior officers from around the fleet, who volunteer their time to visit the class and impart words of wisdom and unique perspectives. Capt. Anthony Jaramillo, Capt. Rick Rivera, Capt. Shannon Thompson and Capt. Mike Windom, Capt. (sel) Will Judd, Capt. (sel) Jason Martinson, Cmdr. Gavin Guidry and Cmdr. Mark

U.S. Navy photos by Jessica Nilsson

Sgt. Skylier Thompson, left, and CWO2 Mark Noble, right, work on a group project together in the JASMMM course.

Axinto contributed their time, talents and insight to help shape the next generation of Naval Aviation logistics leaders.

"The JASMMM course is vital for our supply and maintenance folks, because the curriculum helps strengthen an important core competency: the ability to build relationships. In our business, relationships are everything," said Capt. Jason C. Warner, Commanding Officer of Navy Supply Corps School.

"Aviation supply and maintenance personnel support the same mission of aircraft readiness, but often follow very different processes. JASMMM builds procedural awareness 'across the aisle,' which leads to professional understanding and, most importantly, trust."

So far in 2024, the JASMMM team spent has 41 days on the road, with an additional two-week MTT in July.

The JASMMM curriculum covers a wide variety of topics relevant to the Naval Aviation Enterprise (NAE), ranging from basic Naval Aviation squadron and supply department organizational structures to complex weapons system acquisition and provisioning programs. Students attending the class have earned many years of work experience, but that experience is often very specialized. Course graduates leave the program with a broader perspective of where their units fit into the larger Naval Aviation Enterprise and a firm understanding of the NAE's resource scope.

The JASMMM team generally conducts three to four MTTs and seven to eight home classes in Newport per fiscal year. Due to the limited nature of MTT events, units are strongly encouraged to fund travel for students to attend Newport classes. Commands interested in scheduling an MTT must meet certain eligibility criteria, which includes a student participation minimum and specific facility requirements.

Submit MTT inquiries or general questions to the JASMMM team at **NSCS_JASMMM@us.navy.mil**.

Lt. Cmdr. John Kamensky is the Joint Aviation Supply and Maintenance Material Management (JASMMM) Team Lead at the Navy Supply Corps School, Newport, Rhode Island.

A group of JASMMM students converse while figuring out how to solve the present problem set.

CWO2 Carlos Ayala works on an assignment for the JASMMM course.

Manufactured by

Two USS Ronald Reagan Sailors Recreate a Tool for the First Time Aboard an Aircraft Carrier

By Petty Officer 2nd Class Timothy Dimal

In the machine repair shop aboard USS Ronald Reagan (CVN 76), time ticks by at the speed of a spinning lathe shaving down a piece of steel. While spring-shaped metal chips fly into the air and pile onto the floor, the sound of jets landing on the flight deck booms overhead—each hit serving as a reminder that time is running out.

Machinery Repairman 1st Class Adam Lachman, repair division leading petty officer, from East Meadow, New York, and Machinery Repairman 2nd Class Kyle Martin, from Houston, led Ronald Reagan's machine repair team in redesigning and fabricating a tool that helped to repair parts of the ship's arresting gear wire system, May 30.

"I like to live by the statement: 'If we can't fix it, only God can,'" Lachman said. "There's never been a repair that Ronald Reagan's machine shop couldn't complete."

The tool, a valve seat wrench, was originally manufactured

Machinery Repairman 1st Class Adam Lachman operates a lathe to turn a piece of steel in the machine repair shop aboard USS Ronald Reagan (CVN 76).

U.S. Navy photo by MC2 Timothy Dimal

Lachman Martin:

by Lockheed Martin. Other carriers and shore facilities had not successfully managed to recreate the tool. However, on May 27, a loose bolt was found within an arresting gear's hydraulic systems, causing critical damage.

Castro said that without the number two wire, the number three wire would have "taken an extreme beating for several days," requiring more maintenance and severely disrupting the V-2 maintenance team's normal cycles.

The valve seat wrench Lachman and Martin were tasked to create was the only way to access the damaged part within the system. With the number two wire on the line, the repair team kept their machines running continuously for three days, working through nights and into the mornings.

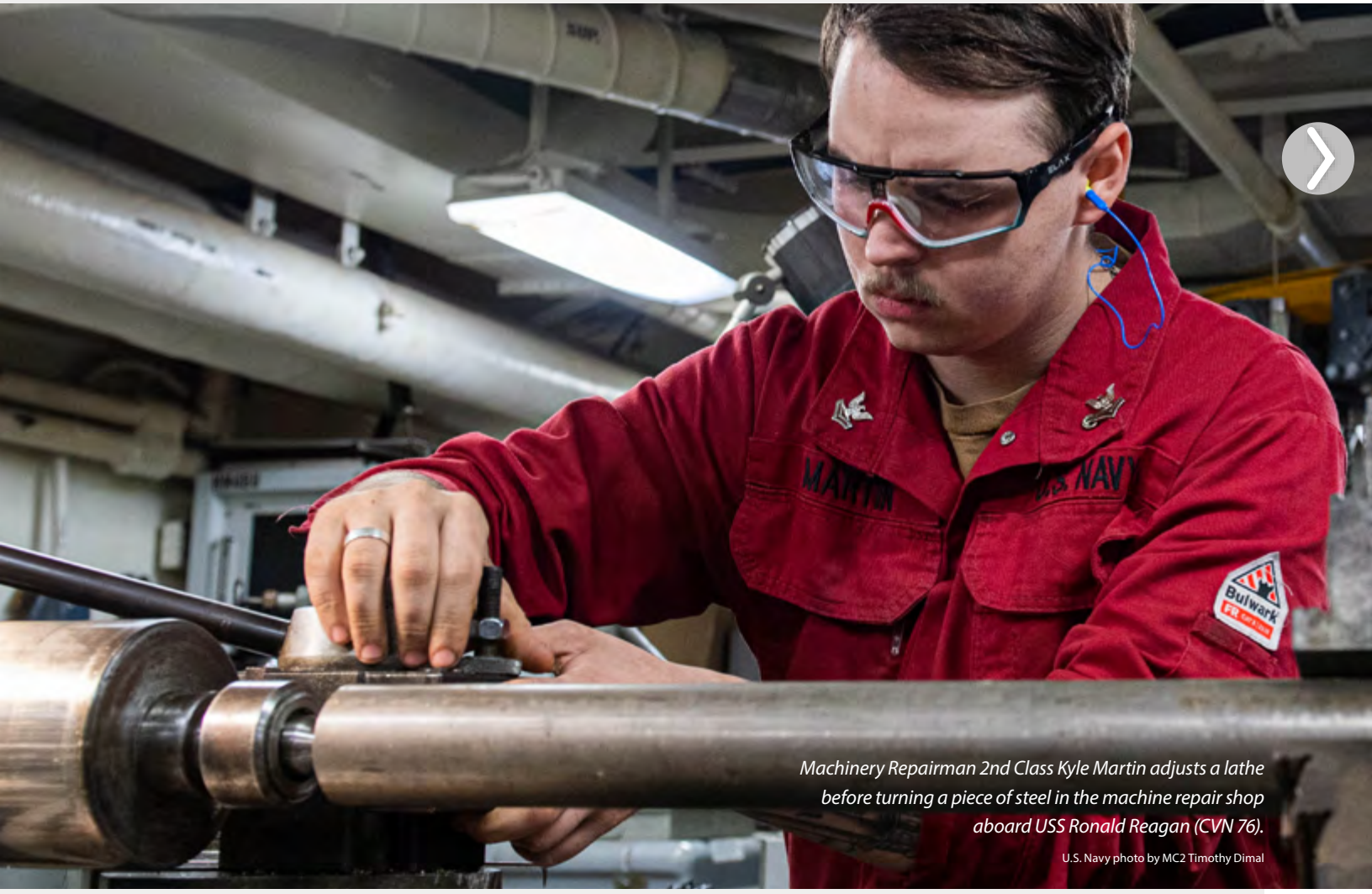
"What's amazing about what they did is a lot of aircraft carriers in the fleet have failed to extract that seat out of that [valve bowl assembly]," Castro said. "We were told basically, 'Good luck. If you get it, good on you guys. If you don't, we're not surprised.'"

The missing tool was their biggest challenge to completing the repair, Castro said. That's why he asked the machine repair team for help fabricating it.

"[Lachman and Martin] didn't hesitate at all," Castro said. "They came up and scoped it out, and they said 'We've got this' from the get-go, with no hesitation whatsoever."

Not only did the team successfully recreate the tool, it was also the first of its kind to successfully complete the arresting gear maintenance. Additionally, their critical thinking skills led to them crafting a tool that was more efficient than the original design.

"As soon as we received the drawing, we realized how big



Machinery Repairman 2nd Class Kyle Martin adjusts a lathe before turning a piece of steel in the machine repair shop aboard USS Ronald Reagan (CVN 76).

U.S. Navy photo by MC2 Timothy Dimal

U.S. Navy photo by MC2 Timothy Dimal

U.S. Navy photo by MC2 Timothy Dimal

Machinery Repairman 1st Class Adam Lachman uses a micrometer to measure a piece of steel before operating a lathe in the machine repair shop aboard USS Ronald Reagan (CVN 76).

of a part it was," Martin said. "We designed something about 35 percent smaller because we knew we had to carry it up to the 0-3 level. If we started with the original size, then it would've taken an extra three days to make—almost a week in total."

A few days after they completed the tool, Capt. Daryle Cardone, commanding officer of Ronald Reagan, expressed his gratitude towards the two Sailors on the 1MC, explaining their efforts to the crew and emphasizing the impact they had on flight operations.

"It feels good to receive some recognition for the work we did. I'll take some when I get some," Lachman said. "But I do believe [Martin] and [Hull Maintenance Technician 3rd Class] Austin Gilbert deserve most of it."

Both Lachman and Martin credit Gilbert for being on constant standby to weld between the periods they machined the tool. During the three days of work, it was a back and forth operation amongst the repair stations in the shop.

"Gilbert did a lot of welding for a good part of this," Martin said. "I remember taking it off the lathe while it was still hot and directly handing it over to him for welding."

Lachman and Martin take pride in their machining skills. Lachman expressed that as long as he is in the Navy, he will keep machining. Martin is proud of his work so far on Ronald Reagan, and while he plans to continue it elsewhere, he stressed the importance of learning one's craft.

Machinery Repairman 2nd Class Kyle Martin operates a lathe to turn a piece of steel in the machine repair shop aboard USS Ronald Reagan (CVN 76).

U.S. Navy photo by MC3 Natasha ChevalierLosada

Hull Maintenance Technician 3rd Class Austin Gilbert adjusts piping in the weld shop of USS Ronald Reagan (CVN 76).

"It makes me feel like 45 bucks an hour," Martin said with a smile. "I don't plan on making the military my life career, but I do plan on continuing to machine. Just knowing that our standards, knowledge and capability of power have been set even higher, based on other carriers and shore commands, makes me sit back and smile. It feels nice that when people need something, they reach out to us first."

While maintenance is an important skill for every Sailor on a forward-deployed aircraft carrier, some of the bigger jobs are saved for outside entities to manage. Lachman believes that a well-trained repair team can tackle a lot of those bigger jobs with some trust and investment.

"I think we need to come back to relying on Sailors to conduct self-repair," Lachman said. "Our machines in our shop can make parts to fix themselves. This is pure ownership."

The new-and-improved valve seat wrench is now installed on the deck next to the arresting gear engine it was used to repair, in case it needs to be used again. While the original purpose of the tool remains, it now also stands as a symbol of the ingenuity and craftsmanship of the Ronald Reagan machine repair shop team, bearing an engraved name plate with the words: "Manufactured by Lachman Martin."

Petty Officer 2nd Class Timothy Dimal is with USS Ronald Reagan (CVN 76) public affairs.

CNO Selects FRCE to Receive Shore Safety Award for Third Time

A commitment to safety and occupational health excellence has earned Fleet Readiness Center East (FRCE) the 2023 Chief of Naval Operations (CNO) Shore Safety Award in the Large Industrial Activity category.

The annual CNO Shore Safety Awards recognize commands with the best overall safety programs that emphasize risk management and mishap prevention, and are considered the top safety award within the Navy. In a message to the fleet, the Chief of Naval Operations Rear Adm. Christopher Engdahl noted the winning commands excelled in the implementation of the Navy's Safety Management System, achieved high-velocity learning, reduced mishaps and costs, and promoted a strong safety culture. This is FRCE's third time receiving the award.

FRCE Compliance and Quality Department Head Amy Morgan said the continuous improvement of safety standards, coupled with a proactive stance on risk management, are what set the depot apart from the competition.

"FRC East has successfully established a positive, risk management-based safety culture embraced by everyone in the depot, with the common goal of providing and maintaining a safe, healthy and productive work environment," Morgan said. "We have worked diligently to transform the depot's safety culture into the success that it is today, and we can see its success in the numbers. Back in 2002, we had 835 OSHA recordable injuries and illnesses. Now, we only see about 30 injuries per year."

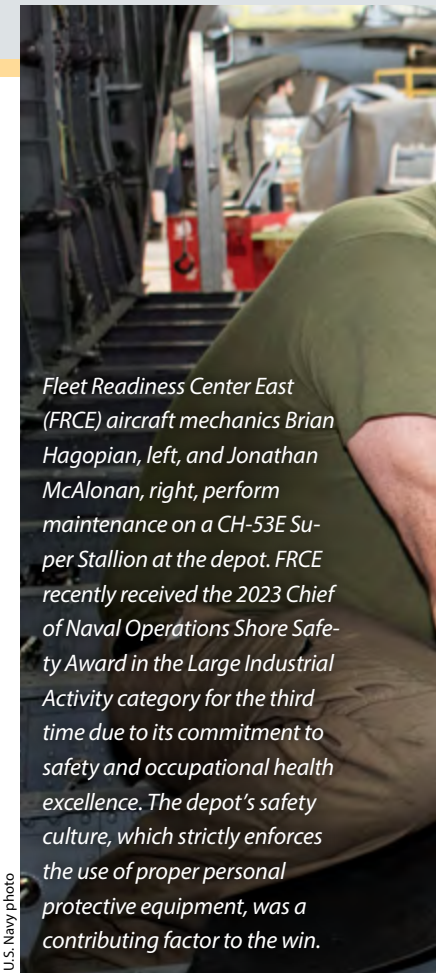
According to Morgan, the command has introduced several safety initiatives over the past two decades, all of which have played a pivotal role in earning the depot this prestigious award.

In 2004, the depot adopted the Occupational Health and Safety Assessment Series 18001, known as the internationally accepted standard for occupational health and safety management systems. FRCE has since transitioned to the International Organization for Standardization 45001 certification, an updated occupational health and safety standardization program.

The command subsequently adopted the Occupational Safety and Health Administration's (OSHA) Voluntary Protection Program (VPP), which focuses on preventing fatalities, injuries and illnesses through a system of hazard prevention and control, worksite analysis, training, and management commitment and worker involvement. In 2019, the United States Department of Labor recognized the depot as a VPP Star Site, making FRCE the first Naval Aviation command to reach that level. VPP is a federal program recognizing employers and workers in private industry and government agencies who have implemented effective safety and health management systems. The depot attained VPP Star recertification in 2023.

Morgan said the depot's investment in VPP has proven to be a very beneficial tool in terms of workplace safety.

"VPP is about education, but it's also an investment in your facility to limit risks and make it as good as it can be," Morgan said. "With VPP, you correct everything within the facility to the VPP standard, which goes beyond what OSHA requires to make a facility safe."



Fleet Readiness Center East (FRCE) aircraft mechanics Brian Hagopian, left, and Jonathan McAlonan, right, perform maintenance on a CH-53E Super Stallion at the depot. FRCE recently received the 2023 Chief of Naval Operations Shore Safety Award in the Large Industrial Activity category for the third time due to its commitment to safety and occupational health excellence. The depot's safety culture, which strictly enforces the use of proper personal protective equipment, was a contributing factor to the win.

U.S. Navy photo

In addition to VPP participation and the implementation of safety management systems, Safety and Occupational Health Division Director Angelo Owens said FRCE provides accelerated safety training for its workforce and strictly enforces a policy requiring all personnel to wear personal protective equipment (PPE) in industrial areas.

"The command has made the OSHA-10 course a requirement for all supervisors," Owens said. "Our safety team has a handful of safety professionals who are certified OSHA trainers that offer the workforce a realistic, relevant, technically accurate means to try and minimize risk throughout the facility. This is a very important, but also large undertaking as we have 10 safety specialists to inform, educate and manage over 4,000 people in over 100 buildings.

"We have multiple fall protection protocols to protect those who are working at heights greater than four feet," he said. "We have a respiratory protection program to protect individuals from inhaling dangerous materials. A majority of the depot's workforce is required to wear safety footwear to minimize workplace injuries and slips. We also require bump caps and protective gloves. These items work together to protect our workforce and mitigate risk."

According to Owens, successfully protecting employees in the workplace plays an essential role in providing capable and quality aircraft to the warfighter.

"By reducing the number of injuries annually, we simultaneously decrease lost work days, giving the depot more manpower to work with," Owens said. "The more manpower we have, the faster we can return aircraft to operational readiness and return them to the Fleet. We have reduced lost work days due to injuries by 81 percent since 2021—that's a lot more manpower put towards aircraft maintenance."

With a workforce of more than 4,000 highly trained military and civilian personnel, establishing and enforcing a culture of safety within the depot is crucial, according to commanding officer Capt. James Belmont.

"It's an honor to be recognized by the Chief of Naval Operations for our depot's safety efforts," Belmont said. "Winning the Shore Safety Award emphasizes the quality of our safety management systems and is a testament to the dedication and hard work of everyone at the depot.

"FRC East enforces strict compliance for safe operations, a proactive safety climate and the professional development of its workforce," Belmont said. "We take pride in our commitment to excellence and our efforts to maintain a world-class safety management system and culture."

For more than eight decades, the depot's mission has been to provide superior maintenance, repair and overhaul support for Navy and Marine Corps aviation weapons platforms, repairing more than 60 aircraft, 65 engines and 11,000 components annually. Executive Officer Capt. Randy Berti emphasized that the nature of the work conducted at FRCE requires the command to place special emphasis on safety within all aspects of daily operations.

"FRC East is a highly industrialized aviation facility with many potentially hazardous processes performed daily, making safety extremely important," Berti said. "Having the right safety precautions and standards in place helps us keep our most valuable asset safe—our workforce."

These successes have also earned the depot recognition from organizations ranging from the Department of Defense (DoD) to the North Carolina Department of Labor, in addition to the CNO.

In 2022, the DoD acknowledged FRCE as the best of the best in terms of safety and occupational health with the Safety and Occupational Health Management System Achievement Award. The award honors commands and individuals that have demonstrated exceptional performance in the implementation and sustainment of a safety management health system that aligns with DoD goals and objectives.

The North Carolina Department of Labor Safety Awards Program recognized the command with seven consecutive Gold Awards and numerous Million Hour awards. The Million Hour Safety Awards are given each time an organization accumulates 1 million employee hours with no injuries or illnesses involving days away from work.

Morgan said while FRCE has earned an impressive safety record, the depot remains focused on protecting its employees and maintaining an aggressive safety posture.

"I'm very proud of this facility and our team for achieving this award," Morgan said. "But our journey of safety in the workplace will never be over. Our goal is to have zero injuries in the workplace. Although that may be hard to accomplish, or seem impossible, we will continue to work toward that goal every day to keep everyone safe."

FRCSW's Materials Lab Machine Shop Remains Innovative, Cutting Edge

At Fleet Readiness Center Southwest (FRCSW), the Materials Lab Machine Shop stands as a cornerstone of innovation and precision engineering. Four integral members of this dynamic team are Blake Whitmee, Senior Materials Engineer; Matthew Wasner, Engineering Technician; John Schneider, Senior Materials Engineer; and Anthony Delgadillo, Senior Materials Engineering Technician. Each has insights into the shop's complex operations and its crucial role in supporting aircraft maintenance and readiness.

Led by seasoned engineers like Whitmee and Schneider, the Materials Lab Machine Shop is at the forefront of cutting-edge technologies and materials science. Their expertise enables the team to tackle complex challenges, from designing custom fixtures to prototyping innovative solutions for aircraft refurbishment. One notable innovation support includes the F/A-18 Hornet Bleed Air Tube Weld Repair Fixture, essential for accurate alignment and quality in weld repairs. Another breakthrough is the use of cold spray technology for the F-35 Lightning II wheel bearing repair, allowing the reuse of previously scrapped components, thus significantly reducing waste and cost. Additional examples supported include the H-60 FLIR (Forward-Looking InfraRed) mount designed for precise helicopter repairs, the F/A-18 Nose Landing Gear trunnion repair fixture tested on scrapped aircraft, and advanced tooling for FRCSW Plating Line improvements.

"We're constantly pushing boundaries," Schneider said. "Our focus is not just on meeting standards but exceeding them, ensuring the highest quality in every component we fabricate."

Wasner emphasized the shop's capabilities in machining and prototyping.

"We take pride in our precision," Wasner said. "Whether it's CNC [computer numerical control] machining or specialized heat treatments, we ensure every part meets exact specifications."

The ability to rapidly prototype and iterate on designs is a game-changer for FRCSW's operations. This capability was crucial in developing and testing the Lakehurst Mobile F-18 Main Landing Gear Bearing Repair Prototype, which allows for on-field repairs without the need for large alignment platforms. This innovation not only saves significant time but also reduces logistical burdens, enhancing operational readiness and efficiency. Furthermore, it allows for tackling the most complex problems quickly, starting with designing multiple courses of action, which are refined through fast feedback loops, ensuring timely solutions that are technically sound, within budget, and rapidly produced.

Matthew Wasner, a materials laboratory engineering technician at Fleet Readiness Center Southwest, performs one of his various responsibilities in the machine shop.

U.S. Navy photo

"Our role is to turn concepts into reality," Delgadillo said. "We work closely with engineers to refine designs and produce functional prototypes in record time."

The Materials Lab Machine Shop plays a pivotal role in supporting fleet readiness by reducing downtime and costs associated with outsourcing. "By having these capabilities in-house, we can respond swiftly to maintenance needs, ensuring aircraft are ready for deployment," Whitmee said.

Moreover, the shop's emphasis on sustainability and resourcefulness is noteworthy.

"We often repurpose and refurbish parts," Schneider said. "This not only saves costs but also aligns with our commitment to environmental responsibility."

As FRCSW continues to evolve, so does the Materials Lab Machine Shop.

"We're always exploring new technologies," Wasner said. "Metal additive manufacturing, advanced machining techniques—these are areas we're actively exploring to enhance our capabilities."

The Materials Lab Machine Shop exemplifies FRCSW's commitment to excellence and innovation in aircraft maintenance, repair and overhaul. With a dedicated team and state-of-the-art facilities, they remain poised to meet the challenges of tomorrow's aerospace industry.

Fleet Readiness Center East (FRCE) recently restored a retired Douglas A-4M Skyhawk. The aircraft will be a historical display onboard Marine Corps Air Station Cherry Point, North Carolina, to honor local Marine Attack Squadron 223, who are known for being the last operational A-4 squadron on the East Coast. For many FRCE artisans, this was their first time working on an A-4, which made for a unique experience.

U.S. Navy photos

FRCE Restores Historic Aircraft to Former Glory

Fleet Readiness Center East (FRCE) artisans recently had the rare opportunity to restore a piece of aviation history for display onboard Marine Corps Air Station Cherry Point.

As an aviation maintenance, repair and overhaul facility, FRCE's Aircraft Clean and Paint shops prime and paint each aircraft that passes through the facility. However, artisans had the chance to "travel back in time" as they restored a retired Douglas A-4M Skyhawk—a platform that has not been serviced by the depot in more than 20 years—to its former glory.

Working on the A-4 was a first for many FRCE artisans, including aircraft painter Kirby Mills, as it has been 21 years since the Navy retired its last A-4 Skyhawk in 2003.

"I've done a few restorations for display aircraft, but this is the first A-4 I've seen come through here," Mills said. "I had never worked on an A-4 before. It was very neat and it's nice to see it put to use."

Though this was the depot's first time restoring an A-4 Skyhawk for historical display, it was not the first time FRCE has performed maintenance on an A-4. Prior to the A-4 platform's retirement, FRCE serviced A-4s from 1989-1996.

Stephen T. Gurley, who currently serves as the Fleet Support Team's Critical Item Management Team branch head at FRCE, said seeing an A-4 back at the depot made him feel as though he traveled back in time.

"The A-4 platform was the first aircraft platform I worked on at FRC East in 1991, and I spent a lot of time working on them," Gurley said. "I traveled to different squadrons all throughout the '90s to repair A-4s, and now to hear about this, it's exciting. It brings back memories."

Aircraft Transfer Branch planner Jeffrey Mitchell said this project was unique because it has a one-of-a-kind paint scheme.

"This is the fourth historical aircraft we have done for the air station, but the first A-4," Mitchell said. "This project was chosen to honor Marine Attack Squadron 223 here on base, who flew the A-4 until '87 when they received their first McDonald-Douglas AV-8."

FRCE's Aircraft Paint Shop provides paint

schemes for the aircraft the depot services, but due to the A-4s historic ties, Mitchell and his team sought additional help.

"We worked with historians at Marine Attack Squadron 223 for this aircraft's paint scheme as the squadron is still stationed here," Mitchell said. "We were able to get pictures and ideas from them; they were very helpful. We wanted to make this aircraft look like it did back in the day."

Mills said due to the nature of this restoration, they were able to put their own touches on the aircraft's paint scheme.

"It was nice to have a bit of our own creative freedom with this paint scheme," Mills said.

In addition to a unique paint scheme, Mitchell said restoring historical aircraft for display differs from the processes used to paint the operational aircraft the depot normally services.

"We still painted it with the same color schemes as what they used during that time, but the overall paint job does differ from a regular aircraft painting process," Mitchell said. "When you see aircraft flying missions, they usually look weathered and dull. For restoration jobs, we put a good clear coat on the aircraft to help withstand the sun and weather. The clear coat really helps protect the paint from bubbling up and fading over time."

The Vietnam-era aircraft known as the Douglas A-4 Skyhawk was a single-seat attack aircraft developed for the Navy and Marine Corps in the 1950s and remained in service until 2003 when the Navy announced its retirement. The aircraft quickly became popular due to its compact size, lightweight body and ground attack capabilities.

Aircraft Clean and Paint Shop Supervisor Ronald Gray emphasized that while restoration projects like the A-4 deviate from FRCE's usual focus on maintaining the fleet's operational aircraft, they showcase yet another way the depot's artisans provide service to the fleet.

"Reviving old, retired aircraft like the A-4 for display is such an honor," Gray said. "In doing so, we honor the depot's history, the aircraft's history, the aviators who flew A-4s and those who serviced it."

Having been in an aircraft storage facility for many years, the retired A-4M Skyhawk was in need of repair upon arrival at Fleet Readiness Center East.

Fleet Readiness Center East Aircraft Paint Shop artisans prepare the historic Douglas A-4M Skyhawk for a fresh coat of paint by sanding the surface to remove any old paint.

Fleet Readiness Center East (FRCE) Aircraft Paint Shop artisans apply stencils to the retired Douglas A-4M Skyhawk to ensure the placement and quality of the aircraft's major markings and insignia. FRCE Artisans worked with local historians to design a historically accurate paint scheme.

Fleet Readiness Center East (FRCE) Aircraft Paint Shop artisans apply stencils to the retired Douglas A-4M Skyhawk to ensure the placement and quality of the aircraft's major markings and insignia.

FRCE Adopts New System to Improve Aircraft Paint Process

A new capability at Fleet Readiness Center East (FRCE) is streamlining the aircraft painting process, allowing the depot to decrease maintenance turnaround time and return aircraft to the fleet faster than ever before.

The Fleet Support Team's Materials and Processes Branch and Digital Data Center are working together to improve the final finish process within the depot's Aircraft Paint Shop with the adoption of a laser projection system. The system acts as a guide for the precise placement of markings and insignia by projecting their outlines onto the aircraft.

According to Steven Lofy, senior materials engineer for the Materials Branch's Corrosion and Wear Team, the system has bolstered the depot's capabilities by decreasing turnaround time and labor hours and producing a reliable and repeatable aircraft paint process, all while offering artisans ergonomic and safety benefits.

"It takes an extensive amount of time and labor to mask aircraft for the application of major markings and insignia during the final finish process," Lofy said. "It's a demanding process based on old, paper drawings that can be difficult to read, making it challenging for our artisans to mask the exact areas on each aircraft consistently. The laser projection system makes the process much more precise and reliable when masking and applying stencils to an aircraft, while also saving a significant amount of time.

U.S. Navy photo

Ben Davidson, aircraft painter for the Fleet Readiness Center East Aircraft Paint Shop, uses the laser projection system to mask rescue arrows onto a MV-22B Osprey flown by the Marine Helicopter Squadron. The laser projection system acts as a guide for the precise placement of markings and insignia on aircraft during the final finish process.

"With the laser projection system, we can simply come in, turn on the projectors and actually project where each marking should be on the aircraft," Lofy said. "All we have to do from there is line each stencil up, mask and paint."

The FRCE Aircraft Clean and Paint Shop primes and paints the aircraft that pass through the aviation maintenance, repair and overhaul facility. Masking is a meticulous process during which artisans apply tape, film and paper to aircraft to outline areas to be painted and protect other areas from paint overspray. Precision and attention to detail are essential, especially when masking aircraft markings that cannot be stenciled, such as the horizontal white stripes on the "Green Top" MV-22B Osprey, flown by Marine Helicopter Squadron (HMX) 1 or the gold stripes on the UH-1N Huey helicopters assigned to the Air Force's 1st Helicopter Squadron.

FRCE successfully tested the laser projection system for the first time to paint the white stripes onto an HMX-1 V-22 in January. According to Lofy, using the laser projection system on that aircraft reduced the labor hours required to mask the stripes in preparation for paint by over 85 percent.

"The HMX-1 V-22 is one of our more difficult aircraft to paint because of the two horizontal white stripes that go down its entire body," Lofy said. "Taping off the stripes in preparation for paint used to take us about 16 labor hours. Artisans were having to do their best to tape off straight lines across the entire aircraft by hand, which is very difficult to do on a flat surface, let alone on the bumpy, curved surface of an aircraft. Whereas now, with the laser projection

U.S. Navy photo

Fleet Readiness Center East is working to streamline the final finish process within the depot's Aircraft Clean and Paint Shop with the adoption of a laser projection system. The system acts as a guide for the precise placement of markings and insignia on aircraft by projecting their outlines onto the aircraft.

system, we can tape off the stripes in approximately two hours, and they are guaranteed to be perfectly straight and accurately placed every time."

In addition to reducing turnaround time within the Aircraft Paint Shop, the laser projection system also creates a reliable and repeatable process for painting aircraft.

Lofy said this is especially important when painting high visibility aircraft such as the HMX-1 V-22 and the UH-1N Huey. They are painted for appearance, he said, unlike other aircraft which are painted for form, fit and function. In addition to boosting efficiency, the laser projection system will also allow for a safer work environment.

"To mask and stencil these aircraft, artisans have to climb up and down stairs or onto the side of the aircraft multiple times to try to get those two perfectly straight lines along both sides of the aircraft," Lofy said. "The laser projection system removes all of the back and forth by projecting the perfectly straight lines across the aircraft for the artisans to use as guide."

In addition to making the workplace safer, Materials and Processes Branch Head Christopher Gladson said the laser projection system also cuts costs due to the time it saves during the final finish process.

"For the HMX-1 V-22 stripes alone, we save about 14 hours by using the laser projection system, and that's only for one of the major markings we are using the system for," Gladson said. "We plan to project between 10 and 53 markings across the aircraft we service. Just think about the additional time we will save by using this system for 53 markings. That's a lot of time and money we can save."

Matthew Mullins, a production support engineer at the depot's Digital Data Center, said FRCE is already working to explain the system's capabilities. To do this, Mullins said the Digital Data Center obtains 3D renderings of the various aircraft FRCE services, which are then uploaded into the projection system's software. From there, engineers transfer the 2D stencils and drawings of these aircraft markings and insignia into the 3D software.

"To date, the depot has successfully tested the system on four of the aircraft serviced by the depot," Mullins said. "First was the HMX-1 V-22 and UH-1N, and then we tested the system on the MH-53E, MV-22. Once we test it and tweak it so everything lines up perfectly, it's ready to use. The system is very user friendly. The paint shop will simply roll the projectors out and pick which aircraft file they'd like to project. It's that simple."

Aircraft Paint Shop Supervisor Ronald Gray said he looks forward to using the laser projection system on a regular basis.

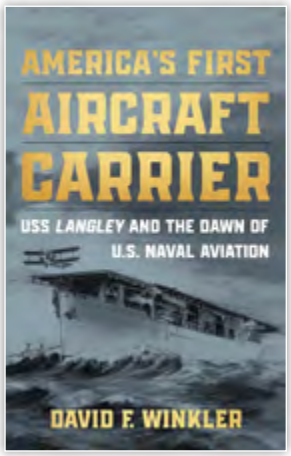
"After seeing how helpful the system was with the stripes on the HMX-1 V-22, I am eager to see what else it can do," Gray said. "The shop's artisans spend a lot of time and energy to make sure each marking is painted in the right place, so this will help us not only become more accurate with placement, but also save their energy. Hopefully, we can make the most out of the time and energy the system will save us by completing more aircraft than ever before."

Professional Reading

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

America's First Aircraft Carrier, USS Langley and the Dawn of U.S. Naval Aviation

By David F. Winkler, Naval Institute Press, Annapolis, Maryland. 2024. 284 pp. Ill.



This heavily researched history of the first American aircraft carrier might be considered the story of two entirely different ships that began in the first years of the 20th century, as America seriously developed a fleet of ocean-going battleships and assorted other ships—most notably 1907's, "The Great White Fleet" of President Theodore Roosevelt.

Great Britain was involved with beginning a totally new class of capital ships, one that would operate a newcomer to the world's arsenal—the airplane, just in time for what was, indeed, the First World War.

The book begins with a surprisingly highly-detailed description of early-century programs of funding and constructing a small fleet of coal-carrying colliers because the U.S. fleet did not want to defend British support of bringing coal to American ships, drawing the "Stars and Stripes" into areas far from U.S. ports. Indeed, to say the first U.S. collier would become the first U.S. aircraft carrier following Britain's initial success in WWI was to ignore what became a major program to design and finally produce a bona fide, if initially limited air-capable ship whose main weapon was, after all, equally capable of being launched and recovered for offensive missions against an enemy target.

It is also surprising how active the collier USS Jupiter (AC 3) was before she was decommissioned in 1920 to begin her transition to her new career as America's first true aircraft carrier, making several deployments to supply the fleet with coal wherever it was needed.

The discussion period about using the Jupiter as the ship to be changed into a carrier was long and complicated, and a wonder any conclusion was reached at all. At one point, thoughts turned to using it as a seaplane carrier—which at the time meant flying boats, which was usually where U.S. Navy expertise lay.

Various personalities make their appearance early in their careers such as, John Towers, Cmdr. Husband E. Kimmel (later rear admiral and commanding officer of the fleet at Pearl Harbor when the Japanese made their surprise attack on Dec. 7, 1941), and Brigadier Gen. William "Billy" Mitchell, who would be in a few years, better known for his sometimes-brash concepts about the future of Army aviation versus Navy ships, and later his court martial. His Martin bombers sunk the WWI German battleship Ostfriesland on July 21, 1921, during a demonstration mission when the ship was anchored offshore.

Winkler's research and ability to absorb all he had learned is quickly apparent from the first pages. The book details the Jupiter's busy early years and the equally busy years she and her crew endured to decide to convert "the covered wagon," as she was affectionately known, after her conversion as the Langley, and to ferret out their "new" ship's little-known personality, capabilities and drawbacks.

Early developments and operations on the flight deck with the cadre of early naval aviators are fascinating reading as are the first Navy carrier aircraft, such as the first operations of the Naval Aircraft Factory (NAF) PT (Patrol Torpedo) "seadrome," a briefly produced torpedo-carrying aircraft, a hodge-podge collection of other aircraft's parts. It was produced as a floatplane as well as a wheeled land plane in the fashion of the time, yet the author notes it "roared down the deck," which is hardly within

Photo by Wilkinson. Collection of Thomas P. Naughton, courtesy of U.S. Naval History and Heritage Command (NHHC)

The collier USS Jupiter (AC 3) circa 1916-1917.

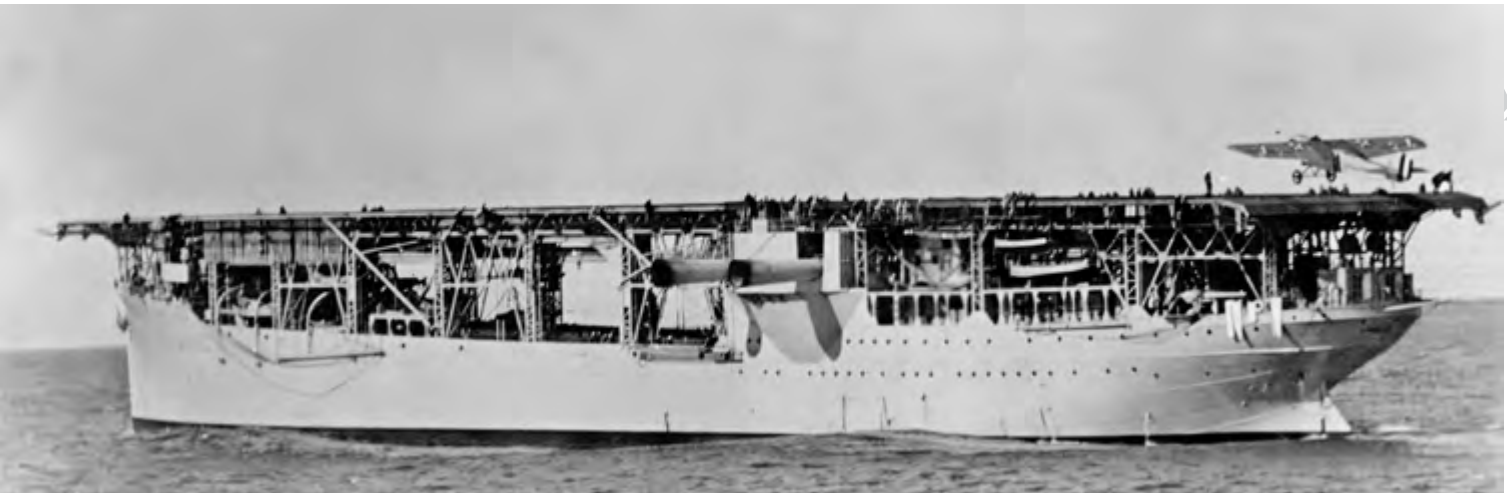


Photo courtesy of NHHC

After its conversion to an aircraft carrier and its recommissioning as the USS Langley (CV 1) on March 20, 1922, the Langley became a research ship as well as part of a regular fleet. This photo shows an Aeromarine B coming aboard.

the limited capabilities of the WWI era early carrier types.

There have only been a very few book-length accounts dealing with the Navy's carriers of early decades of deployments and accompanying aircraft and the new flight rules and procedures of their unique and often highly dangerous, yet important atmosphere, which quickly became the crown of national defense and diplomacy.

The Langley moved back and forth from Norfolk, Virginia, to Washington, D.C., displaying for the public, politicians and senior Navy people. While the visiting IJN captain could have been Isoroku Yamamoto, the planner of the Pearl Harbor raid on December 7, 1941, which thrust the U.S. into the war, and who had spent time in the U.S., at Harvard, and who was fluent in English, and who understood Americans well enough to be concerned what the raid might result in firming American resolve, he had actually returned to Japan by this time. The visiting Japanese captain was someone else, who was never named in the Langley's deck log.

Winkler's account constantly amazes me: the original collier Jupiter had a well-defined career, then it became the first U.S. carrier alternating between that of an active busy sea-borne experiment, followed by part of its nation's growing defense. It took on growing numbers of aircraft, each with a specific purpose and mission, lasting and somewhat proudly. It sadly went into harm's way to meet its end in combat against a tough, highly capable enemy whose many faceted operations had learned the trade and skills by closely watching how the American carrier crews had developed their new trade and mission. I will note that following chronology the various fleet exercises in which the Langley participated in was somewhat difficult because the author did not always indicate the year.

The year 1924 was a time of moving, shuttling back and forth along the Atlantic coast participating in several exercises to

A rarely seen photo shows the Langley off Naval Air Station Pensacola, Florida, circa 1929. The aircraft in the foreground is a Curtiss F6C-3, which entered service in 1927 after the Langley had transferred to the Pacific Fleet. The aircraft's fuselage markings are unusual in that they use letters rather than a combination of letters and numbers to indicate its squadron and position in the squadron, which is VB-1B, a carrier-based bomber squadron. Thus, IBD indicates this aircraft is the fourth in that unit. Although there has never been a satisfactory explanation for this odd designation system, it was probably developed to prevent any confusion between these aircraft and their new incoming F3B-1s. The first F3Bs began service with Fighting Squadron (VF) 2B in 1928, with the squadron soon reverting to its original designation of VF-6B. It was definitely a time of development and experimentation.

Photo from the Lt. Gustave J. Freret Collection, courtesy of NHHC

Two Naval Air Factory TS-1s of Fighter Squadron (VF) 1 warm up on the Langley's flight deck in 1923. The TS-1 was the first squadron fighter aboard the Langley and was only armed with a single .30 caliber machine gun firing through the propeller. When the TS-1 was equipped with floats as a seaplane, it was craned over the side to the water and recovered the same way.

display the capabilities of its air groups while dealing with its flight deck's position of the ship's smoke stacks, a concern that remains even in today's modern designs in different ways, creating air burbles that occasionally interfere with the safety of daily aircraft approaches.

By late 1924, the Langley made its long-scheduled trip to San Diego to join the Pacific Fleet, bringing new aircraft and their crews. Oddly enough, the naval exercises of the period would often pit U.S. forces against those of Japan. It was also definitely a time of developing and training for the cadre of young newly-winged naval aviators as well as the ships' companies, as well as bringing more and new aircraft to replace the older and rapidly aging aircraft that had first served as the Langley's initial air groups for newer, stronger, more powerful aircraft that could dive straight down over a target and deliver a more accurate strafing run. Vought's UO-1 "fighter" was soon replaced by the VE-7, also from Vought, when the UO-1 proved unsatisfactory. Winkler's research and resulting narrative delivers occasionally esoteric but very interesting often little-known information that make his biography of this country's first aircraft carrier much more than simply another account of another flattop which also makes it an important and unexpected companion to the recently published (also by the Naval Institute Press, which we just reviewed in the Winter 2024 issue) biography of Eugene Ely, who it might be said started the entire concept of an aircraft launching from and recovering aboard an American warship.

Photo courtesy of NHHC

A full flight deck while at anchor at Pearl Harbor, May 1928. There are 34 aircraft on her crowded flight deck, and probably more below.

The book even gives details of Cmdr. Frank W. "Spig" Wead's storied career as portrayed in the 1957 John Ford-directed film "Wings of Eagles." John Wayne plays the title role of this pilot-turned-screenwriter to tell the story of Naval Aviation from the beginning through WWII. The Langley's story appears in the early periods shown in the film. A few of the other actors who appear in various roles that today's enthusiasts might recognize are Walter Brennan, Ken Curtis (known as Festus in the long-running TV "Gunsmoke" western series), and veteran western star Ward Bond of TV's "Wagon Train" fame.

Winkler keeps a tremendous number of details together, yet in entertaining chronological developmental sequence throughout the narrative—not an easy thing for an historian and author. However, he is up to the demanding challenge. The between-wars narrative covers the Langley's busy schedule of encounters with the fleet, including its new aircraft carriers, mainly the Lexington (CV 2) and Saratoga (CV 3), which would join the force to play an initially major part in the early Pacific war after Pearl Harbor.

Great Britain did have several carriers and its own naval aircraft that saw considerable pre-war service. During the war, the British made great use of a mix of their own and several American-made aircraft such as the Grumman F4F Wildcat (which they called the Martlet), and later on, the Vought F4U Corsair, Grumman F6F Hellcat and TBM Avenger. France had a single aircraft carrier, the Bearn, the only one France produced until after WWII. Converted from an unfinished battleship, the Bearn entered service in 1928, but was taken out of service in mid-1942 to ensure she was not used against the Allies. Her aircraft consisted mainly of French-manufactured types, but did include a squadron of Vought V-165Fs, exports of the American SB2U Vindicator dive bomber, whose main claim to fame came when they were flown by Marine Corps crews in the climactic Battle of Midway in June 1942.

France was quickly overwhelmed by Germany in June 1940, and most of its Navy ships and aircraft were quickly assimilated into a single unit named for Vichy and for a time fought alongside the Nazi Blitzkrieg—their aircraft colorfully marked in yellow-and-red stripes—for approximately 1941-42, especially during Operation Torch, the Allied invasion of North Africa in November 1942. Strange, but although the Langley was busy

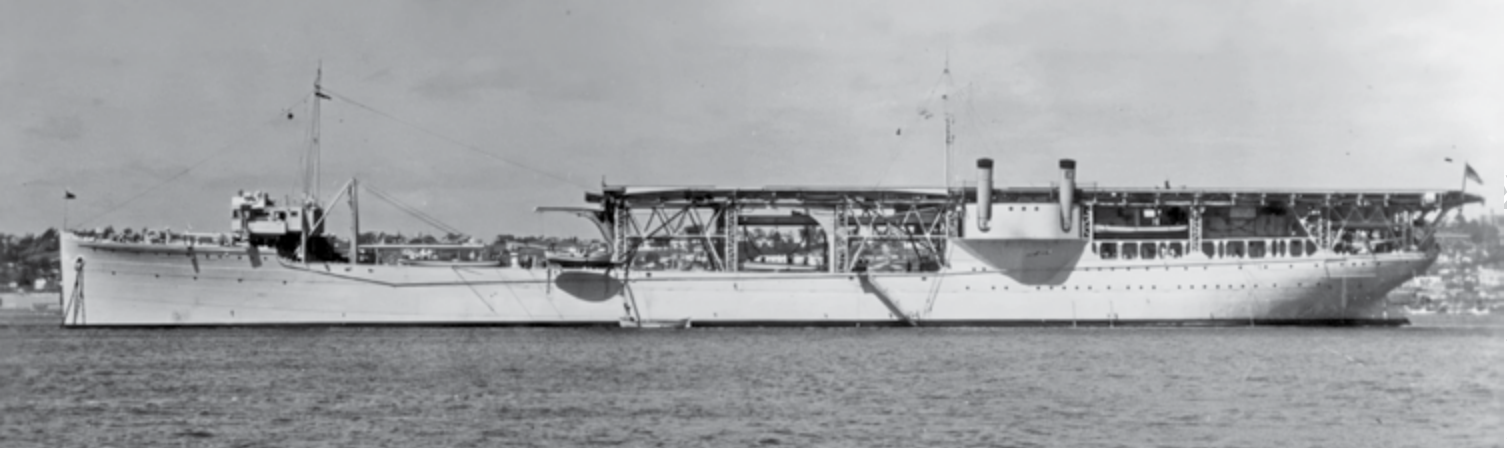


Photo courtesy of NHHC

After its conversion to an aircraft carrier and its recommissioning as the USS Langley (CV 1) on March 20, 1922, the Langley began as both a research ship as well as part of a regular fleet. This photo shows an Aeromarine B coming aboard piloted by Lt. Cmdr. Geoffrey DeChevalier, Naval Aviator No. 7, making the first landing aboard the Navy's first aircraft carrier on Oct. 26, 1922.

throughout the 1920s and 1930s, and her crews came and went, the book's narrative seems peaceful with little concern with events that were building toward the cataclysm of World War II.

On a personal note, the author references then-Lt. (later Rear Adm.) Rufus Fairchild Zogbaum Jr., (1879-1956), who at the time was serving as the carrier's "gun boss," or head of the ship's weapons department, and his career ended with his promotion to two-star rank of rear admiral, as well as his achieving a naval aviator's wings of gold. He also notes his being the son of noted illustrator Rufus Fairchild Zogbaum (1849-1925), whose magazine work in the 19th century paralleled that of western artist Frederick Remington and other major illustrators of the period (I graduated in 1967 from the Rhode Island School of Design's illustration department but admittedly, I never showed capabilities that even approached those of the senior Zogbaum).

I would have been interested to see how talented his son—a Navy pilot and two-star admiral—might have been. As things transpired, Lt. Zogbaum had to deal with Eugene Ely who was monitoring progress of the construction of a landing platform for Ely's early aircraft, which was being built right over the CO's quarters, which did not please then-captain-later rear admiral Charles F. Pond at all; he complained of the noise.

The decade of the 1930s was filled with exercises and dry-dock maintenance, keeping the old ship in as best shape as possible. In 1937, in another drastic shape and mission change, the now-aging carrier was made a seaplane tender (now AV 3), which reduced her flight deck by at least 25 percent as she supported PBY Catalinas that patrolled areas of concern, especially with apparent Japanese warlike intentions becoming clearer, with increased action in China on the ground and in the air, often by the use of IJN carrier planes involved, as well as Southeast Asia that would turn out to be much more important 20 years later as American forces entered yet another war—Vietnam.

The Langley entered its first and last combat and was attacked by IJN land-based Mitsubishi G4M1 bombers (later known as Bettys in the Allied code system) on Feb. 26, 1942, off Java when they dropped seven bombs on the poorly-armed ship, now without its flattop flight deck and defending fighters. The order to abandon ship came at 1:32 p.m. local time. However, the Langley remained afloat, but listing increasingly as water poured into her from bomb damage. Finally, one of the escorting American destroyers, USS Whipple (DD 217) eventually fired 9-inch shells followed by torpedoes into the first American carrier, which went under 74 miles from Java the next day.

The remaining chapters describe the fight by the Langley's successor as the exhausted American fleet strove to retire and would soon engage a large Japanese fleet in the climactic Battle of Midway that June, in which four Japanese fleet carriers and their aircraft would be sunk by U.S. dive bombers, handing the Japanese their first major defeat.

Photo courtesy of NHHC

The Navy's first carrier is shown sinking on Feb. 27, 1942, south of Java. The photo was taken from the destroyer USS Whipple (DD 217), which would soon deliver the final blows with guns and torpedoes after the Langley was hit by land-based Japanese G4M1 bombers.

F-8 Crusader, Vietnam 1963-73, By Peter E. Davies, Osprey Publishing, UK. 2023. 80 pp. Ill.

One of the latest in Osprey's Dogfight Series, this new book by well-published authority Peter Davies is one of the best analyses of the Crusader's design and attributes. The brief history does not mention such things as Tom Hudner's Medal of Honor mission in Korea on Dec. 4, 1950, (although he did fly Crusaders for a brief period in the Cold War afterward), or the change in the U.S. aircraft designation system in October 1962, perhaps a little too much to expect in this brief examination of the F8U/F-8. Still, it is one of the best aircraft analyses I have seen and should add valuable information to what must be a considerable collection of data on the Crusader.

Details of the early combat missions by F-8 pilots Hal Marr and Phil Vampatella are many and not known, and are offered in a new way to old Crusader authorities like me. Although the reference on page 24 to the round count of the four Colt 20 mm cannons being 84 to a later 150 rounds per gun (rpg) is new and inaccurate. The actual count was 125 rpg as confirmed by most veteran Crusader drivers I know.

The cover illustration is another unique image by Osprey illustrator Gareth Hector showing Fighter Squadron (VF) 162 commanding officer Cmdr. Dick Bellinger (a distant relative of Vice Adm. Patrick N.L. Bellinger (1885-1962), naval aviator No. 8) chasing down the first MiG-21 kill by the U.S. Navy in 1966. The two-page ribbon-engagement diagrams by Tim Brown showing the MiG kills by Cmdr. Hal Marr (commanding officer, VF-211) in 1966, Lt. Dick Wyman (VF-162) in 1967, and Cmdr. Lowell "Moose" Myers (commanding officer, VF-51) in 1968 are also different depictions of these well-known successful F-8/MiG encounters.

Photo courtesy Peter B. Mersky Collection

Fighter Squadron (VF) 162 commanding officer Cmdr. Dick Bellinger gets out of F-8E AH 207 following a mission from the Oriskany (CVA 34). Instead of the Navy-supplied flight suit, he sports the so-called camouflaged "duck hunter" suit the squadron obtained before the cruise from a sporting goods store near their base. Not being made of fire-retardant NOMEX, it was not the official flight suit the Navy supplied all flight crews.

U.S. Navy photo

On Oct. 26, 1966, the Oriskany dealt with a tragic fire that resulted in 44 killed and injured 156, many from its Air Wing 16 crews. Like several of his friends and fellow aviators, Bellinger was caught below deck but finally made his way to the safety of the flight deck. In the center of the group, surrounded by friends and shipmates, Bellinger is in a Navy flight suit, they all take stock of who is there, and who isn't.

Photo courtesy Peter B. Mersky Collection

Fully armed with Sidewinder air-to-air missiles, a VF-162 F-8E and its pilot get last-minute attention from flight-deck crewmen before launching from the Oriskany. A VA-164 A-4E marked by its distinctive orange tail chevron is in the background.

Photo courtesy of Istvan Toperczer

MiG-21PFL, a Fishbed D (the NATO code name) was flown by Minh's section leader Capt. Pham Thanh Ngan on Oct. 9, 1966, when he and his wingman attacked two Fighter Squadron (VF) 154 F-4Bs from the USS Coral Sea. Ngan shot down one Phantom, while Minh was soon shot down by Cmdr. Dick Bellinger, commanding officer of VF-162.


Photo courtesy of Istvan Toperczer

On Oct. 9, 1966, two North Vietnamese MiG-21 pilots shot down a U.S. Navy F-4B from Fighter Squadron (VF) 154 from the USS Coral Sea (CVA 43); the pilot and RIO ejected and were captured as POWs, and repatriated in 1973. Immediately after shooting down the American Phantom, one of the VPAF pilots, Capt. Nguyen van Minh flying MiG-21 (Red 4221) was engaged by Cmdr. Dick Bellinger, commanding officer of VF-162, from the USS Oriskany (CVA 34). After a lot of maneuvering by the two fighter pilots, Bellinger shot down the VPAF MiG-21, whose pilot survived the fight and the war. It was the first Navy kill of a North Vietnamese MiG-21 for which Bellinger received the Silver Star, the usual, but certainly no less a decoration at that time of the war for a MiG kill. Here, Minh demonstrates how he and his squadron mate got their Phantom kill for two other pilots and their ground crew.

MiG-21 "Fishbed", Opposing Rolling Thunder 1966-68

By Istvan Toperczer, Osprey Publishing, UK. 2023. 80 pp. Ill.

Another new entry in the Dogfight Series is another book by North Vietnamese Air Force specialist and Hungarian flight surgeon Istvan Toperczer, who has acquired heretofore never-before published knowledge of the Vietnamese People's Air Force (VPAF) and its achievements against American Navy and Air Force fighter pilots. He has written several other Osprey books on VPAF MiG-17 and MiG-19 aces and their units. Also, besides the detailed accounts of the Fishbed (the NATO so-called code names for the MiG-21—Fresco and Farmer being the code names for the MiG-17 and MiG-19, respectively) this new book details a specific period that saw the name of which became "Operation Rolling Thunder" given to the strategic operation by the U.S. Navy/Marine Corps and U.S. Air Force against the North Vietnamese civilian and military targets of interest in hopes of destroying the enemy's ability to make and continue the bloody war against the Allied campaign.

As the author notes, the MiG-21 Fishbed was one of the most successful communist jet fighters ever built. It served in many countries around the world in widely varying numbers. Entering VPAF service in 1966, it flew throughout the war in rather limited numbers. The MiG-17 was probably considered the more dangerous MiG by the U.S. crews in all American services because of its greater maneuverability and its heavy cannon armament—whereas the Fishbed was equipped mainly with missiles (earlier models had one cannon). The MiG-21 was a sophisticated opponent and had supersonic capability the MiG-17 did not have (except in a dive). The MiG-19 Farmer, which was a later design and also served in limited numbers late in the war, was the first Soviet production aircraft to have supersonic capability at level flight. The Farmer was an obvious bridge between the MiG-17 and MiG-21.

The author notes the MiG-21 scored more than 70 American F-4s, while losing 35 of its own, the first of which went to a U.S. Navy F-8E Crusader, flown by VF-162 commanding officer Cmdr. Dick Bellinger, on Oct. 9, 1966.

While two other squadron pilots go over their recent mission, Capt. Nguyen Van Coc, standing right, still wearing his flight helmet, listens. That day, Nov. 18, 1967, the two pilots shot down two U.S. Air Force F-105s, while Coc downed another F-105 with a missile.


Photo courtesy of Istvan Toperczer


Photo courtesy of Istvan Toperczer

The VPAF's top ace was then-Capt, Nguyen Van Coc, shown here in his MiG-21PFM on May 7, 1968, when he shot down an F-4B Phantom of Fighter Squadron (VF) 92, the Silver Kings. Originally a MiG-17 pilot, he transitioned to MiG-21s while training in the USSR in 1965-66. He is credited with nine kills, seven fixed-wing aircraft and two unmanned drones. His MiG may have been one of several that were painted in camouflage, perhaps partially to mid-fuselage, then with the lower fuselage left in its original natural-metal. Note the strap on the left fixed to the MiG-21's forward-opening cockpit canopy like the American Crusader, whose canopy was hinged from the rear. Coc survived the war and retired as lieutenant general, Chief Inspector of the Ministry of National Defense in 2002.

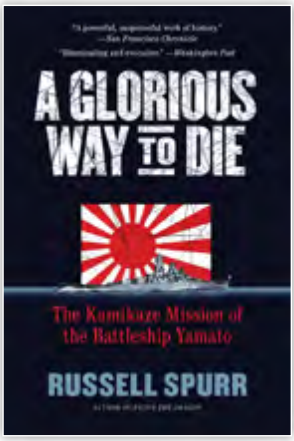
Editor's Choice

The advent of advanced anti-ship weaponry has revived public debate the last several years over the survivability of the nation's largest ships in conflict. When asked last year about the vulnerability of aircraft carriers in the era of hypersonic weapons and other modern threats, then-USS Dwight D. Eisenhower (CVN 69) Capt. Paul Campagna countered those concerns, replying, "For anyone that's worried about the modern threat that's out there, I'll just say that the carrier is not on an island…It deploys with the air wing. It deploys with the strike group. It deploys with a layered defense that goes from the bottom of the ocean and out to space, and anyone who thinks that we're fragile little teacups out there or something like that is grossly mistaken."

To paraphrase the great Mark Twain, the death of the aircraft carrier has been greatly exaggerated.

But while carriers may not be made obsolete, the second installment of "Editor's Choice" below examines a 40-year old volume, "A Glorious Way to Die," that argues that another preeminent force of the seas—the battleship—had, by the start of World War II, been rendered just that by, ironically, aircraft carriers. In his work, author Russell Spur examines the final mission of the largest battleship ever built, the Yamato—a mission that even Japan's Imperial Fleet leaders thought at best unlikely to succeed, and at worst, suicidal.

—David Byrd, Editor in Chief



A Glorious Way to Die: The Kamikaze Mission of the Battleship Yamato.

By Russell Spurr, Newmarket Press, New York. 1981. 368 pp. Ill.

Review By Caroline Tapp

While advancements in technology present opportunities for changes in strategy or tactics, tradition, personality and leadership shape creation and use of new technologies by navies. Four decades have passed since the publication of Russell Spurr's "A Glorious Way to Die," yet his account of the Japanese Imperial Navy's battleship Yamato remains a worthy assessment of how cultural forces can shape technological use and doctrine.

When Spurr arrived in Japan in 1946 as a young lieutenant in the Royal Indian Navy, he first learned of the Japanese super-battleship Yamato from an English-speaking dry dock worker in its former homeport of Kure. Intrigued by the story of the battleship's demise in 1945 during its attempt to defend Okinawa, Spurr returned to Japan in 1952 to research Yamato as a correspondent for the London Daily Express. He reviewed combat assessments, transcripts of interrogations and translations of official Japanese war records. He also conducted interviews with former ensigns from Yamato, who provided intimate details on the final mission. While Spurr suggests the rise of Naval Aviation rendered Yamato obsolete, he spends most of the text offering "insight into the agonizing dilemma of a misguided, courageous people [Japanese] who persisted in continuing a hopeless war" (7). American airpower might have been the immediate cause for Yamato's sinking, but cultural tradition led the Japanese to build the largest battleship in the world and then send it on a self-avowed suicide mission. By sacrificing the pride of the Japanese Imperial Navy, Capt. Shiganori Kami believed that the planned suicide sortie would appeal to the divine, and if, nothing else, be a "glorious way to die" (97).

Broken into six parts, the book presents a compelling narrative style that effortlessly intertwines source material, though

Photos courtesy of Naval History and Heritage Command

The Yamato in the late stages of construction Sept. 20, 1941, alongside the large fitting out portion at Kure Naval Base, Japan.

IJN Battleship Yamato running trials on Oct. 30, 1941.

clear notes would better highlight Spurr's intensive research efforts. The first half of the work sets the stage for the detailed storytelling of the fateful events of April 6 and 7, 1945. Bringing the reader into Kamikaze headquarters, U.S. Task Forces and the East China Sea, Spurr paints a picture of a woefully underprepared Japanese force culminating in Yamato's transition to a kamikaze ship meant to disrupt U.S. plans at Okinawa. Yamato was reclassified as flagship to First Special Task Force and ordered to only carry fuel for the one-way suicide, or Tokko, mission. Japanese leadership had conflicted reactions to Operation Ten-Go (Heaven One), though Spurr suggests it was "fear of shame that [sent] Yamato off on a questionable mission" (125). Spurr's gripping portrayal of Yamato's storied demise offers a detailed analysis of how Japanese leaders decided its fate.

With his sometimes-reductionist consideration of cultural factors, Spurr has presaged more recent scholarship on the Japanese Navy. Instead of concentrating on a technical analysis of the relative merits of different platforms such as aircraft carriers or battleships, Spurr looked at how and why the Japanese built and used the technological marvel they did. More recent works, such as that of Jonathan Parshall and Anthony Tully on the Battle of Midway, also engage with the cultural perspective of the Japanese Imperial Navy and how it influenced doctrine and use of technology. Perhaps more important than establishing the dominance of new technologies, historical perspective reasserts the human element undergirding technologies of war. Spurr reminds readers to consider this perspective as he highlights the complex layers of cultural forces that facilitated the fate of Yamato.

Dr. Caroline Tapp is a historian for the Naval History and Heritage Command.

Yamato maneuvers frantically under attack as a bomb explodes off its port side. The fire in the area of the 6.1 inch turret can be clearly seen.

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