

VINSON CSG RETURNS

‘Air Wing of the Future’ Previewed
During Historic Deployment

WHAT'S INSIDE

- ▶ First H-1 Link 16 Mixed Flight Succeeds
- ▶ NAWCAD Finding Cure for Aircraft Corrosion
- ▶ CMV-22 Capabilities on Display During Relief Effort

A note from the editorial staff

Naval Aviation News has a proud heritage. The United States Navy's oldest periodical, it stands as the flagship magazine for all things Naval Aviation. As it has done since its inception, the magazine chronicles the development, deployment and transformation of the Navy's aircraft and heralds the achievements of the men and women who fly and maintain them. Together, they make the U.S. Navy the world's most powerful, respected and dominant naval force today and far into the future. For over a century, it has been an honor for Naval Aviation News to celebrate and promote the innovation, ingenuity and prowess of the U.S. Navy in flight.

Over the past two and a half years, the COVID-19 pandemic presented many challenges. Just as our nation found many ways to adapt and overcome, we here at Naval Aviation News evolved as well, enabling us to continue fulfilling our mission to report all things Naval Aviation to the fleet, stakeholders and aviation enthusiasts.

Up until this point, we succeeded in finding ways to carry on with little or no disruption. But the long reach of COVID-19 recently hit our supply chain, causing the costs for production to increase dramatically. For this reason, we have made the difficult decision to cease producing the printed version of Naval Aviation News.

This does not mean Naval Aviation News will cease to perform its vital mission, however. On the contrary, as our fleet has evolved to keep pace with and get ahead of technological advances, we too are changing our mission focus. We are hard at work creating a robust, inviting and visually stunning online product that will carry the proud legacy of our print publication into the future. We will continue to produce a downloadable version of our publication for those who wish to consume Naval Aviation News in its original form. This pivot was one that we were already working toward; the supply chain issues simply gave us a strong tailwind.

We invite all of our loyal readers to join us on this next phase of our mission. You can follow our progress by visiting our website <https://navalaviationnews.navylive.dodlive.mil> regularly. 🇺🇸



An F/A-18F Super Hornet attached to the "Gladiators" of Strike Fighter Squadron (VFA) 106 launches Nov. 1 from the aircraft carrier USS Gerald R. Ford (CVN 78). Gerald R. Ford is underway in the Atlantic Ocean conducting carrier qualifications.

U.S. Navy photo by MCSN Riley McDowell

NAVAL AVIATION NEWS

SPRING 2022

VOLUME 104, No. 2

DEPARTMENTS

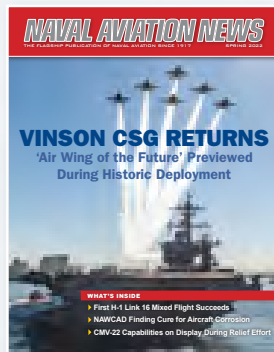
- 4 Flightline
- 7 Grampaw Pettibone
- 8 Airscoop

FEATURES

- 20 **Navy, Industry Come Together at Sea-Air-Space 2022**
- 24 **3rd MAW Demonstrates Lightning Carrier Concept**
- 26 **USS Carl Vinson Celebrates 40th Commissioning Anniversary**
- 27 **Vinson Carrier Strike Group Returns from Deployment**
- 32 **Disaster Relief Mission to Haiti: Highlights Navy/Marine Corps Interoperability, V-22 Capabilities**
- 34 **All-Women Crew Retire C-2A Greyhound in Celebration of Women's History Month**
- 36 **How Naval Aviation is Solving Its Billion-dollar Corrosion Problem**
- 38 **A 'Day in the Life' of Marine Corps Heavy Lift Maintainers**
- 40 **Marines Complete First H-1 Mixed Fleet Link 16 Flight**
- 42 **FRCE Achieves Safety Milestone in 2021**
- 44 **FRC WESTPAC Inducts First Marine V-22 for Maintenance with New Contractor**
- 45 **FRCSW Inducts First CMV-22 to Suffer Mishap**
- 46 **Creative Engineering Solution at FRCE Overcomes Shortage of V-22 APU Filters**
- 48 Professional Reading

ALSO IN THIS ISSUE

ON THE COVER



On the cover: The U.S. Navy Flight Demonstration Squadron, the Blue Angels, fly in the Delta Formation over the aircraft carrier USS Carl Vinson (CVN 70) as it returns from an eight-month deployment. This year marks the centennial of the U.S. naval aircraft carrier in the Navy, which has provided many contributions to national security and the fleet for the past 100 years. (U.S. Navy photo by Chief MCS Paul Archer)

In this edition of Naval Aviation News, we highlight the return of the Carl Vinson Carrier Strike Group starting on page 27, marking the first successful deployment of an aircraft carrier—USS Carl Vinson (CVN 70)—accompanied by a combination of fourth- and fifth-generation platforms within Carrier Air Wing (CVW) 2 that predominantly represent the “Air Wing of the Future.” Taking a glimpse at emerging capabilities, we highlight Air Test and Evaluation Squadron (HX) 21’s successful demonstration of the first two-way connection between an AH-1Z Viper, a UH-1Y Venom and a portable ground station using new Link 16 software on page 40. Naval Air Warfare Center Aircraft Division is finding new ways to battle the silent enemy of corrosion on aircraft, spotlighted on page 36. And in celebration of Women’s History Month, an all-female crew of pilots and support crew flew a C-2A Greyhound to Davis-Monthan Air Force Base, Arizona, for the aircraft’s retirement, highlighted on page 34.

On the back cover: Lt. Luke Theriault directs the pilot of an F/A-18F Super Hornet, attached to the “Red Rippers” of Strike Fighter Squadron (VFA) 11, on the flight deck of the Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75), April 8. The Harry S. Truman Carrier Strike Group is on a scheduled deployment in the U.S. Sixth Fleet area of operations in support of U.S., allied and partner interests in Europe and Africa. (U.S. Navy photo by MC3 Tate Cardinal)

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

Director, Air Warfare

Rear Adm. Andrew Loisel, USN

Editor in Chief

Lisa Gleason, Naval Air Systems Command

Editorial Board

Rita Boland, Naval Aviation Enterprise

FORCM Christopher Chelberg, USN, Naval Air Force Atlantic

Stan Coerr, Headquarters, Marine Corps

Cmdr. Zachary Harrell, USN, Naval Air Forces

Marcia Hart, Naval Air Systems Command

Richard Holcomb, Air Warfare N98

Naval Aviation News Staff

Fred Flerlage, Art Director, Naval Air Systems Command

Rob Perry, Staff Writer/Editor, Naval Air Systems Command

Contributing Editors

Melissa A. Johnson, Naval Air Systems Command

Paul Lagasse, Naval Air Warfare Center Aircraft Division

Columnists

Cmdr. Peter Mersky, USNR (Ret.), Book Review Editor

Cmdr. Bryan Dickerson, USN (Ret.), Contributing Editor

Subscriptions

Due to issues beyond our control, Naval Aviation News is ceasing the publication of our print product and focusing on the development of a full digital experience for readers. Please visit our website <https://www.navalaviationnews.navy.mil> to track our digital migration process and download archive copies of the publication.

Current subscribers will be contacted by the U.S. Government Printing Office with details regarding refunds for the remainder of their 2022 subscription. Questions regarding refunds should be directed to contactcenter@gpo.gov. Official subscriptions to military and government agencies will also discontinue.

Submission Guidelines

Commands may send news and announcements such as awards, rescues, milestones and other achievements to navy_nannews@navy.mil. 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.

Naval Aviation News (USPS 323-310; ISSN 0028-1417) is published quarterly for the Chief of Naval Operations by the Naval Air Systems Command. Periodicals postage is paid at Washington, D.C., and additional mailing offices. The Secretary of the Navy has determined that this publication is necessary in the transaction of business required by law. The use of a name of any specific manufacturer, commercial product, commodity or service in this publication does not imply endorsement by the Navy. Any opinions herein are those of the authors, and do not necessarily represent the views of Naval Aviation News, the Department of the Navy or the Department of Defense.

Approved for public release: SPR No. 2022-253

Postmaster: Send address changes to *Naval Aviation News*, NAVAIR Command Communications Dept., 47123 Buse Road, Suite 547, Patuxent River, MD 20670. SEND YOUR FEEDBACK TO: navy_nannews@us.navy.

SEND YOUR FEEDBACK TO: mailto:navy_nannews@us.navy.mil

Flightline

NAVAIR's Newest Commander Sets Sights on Integration

Editor's note: Vice Adm. Carl P. Chebi, who came aboard in September 2021 as Commander, Naval Air Systems Command (NAVAIR), shares his priorities with Naval Aviation News.

You've been gone from NAVAIR for the last five years. Can you share where you've been and your impressions of NAVAIR since returning?

When I left NAVAIR in 2017 with orders to Program Executive Office (PEO) for Command, Control, Communications, Computers and Intelligence (C4I) and Space Systems, I had very little understanding of C4I or the Naval Information Warfare Systems Command (NAVWAR). After just a couple of months on the job, I quickly realized how important the integrated warfare community and the C4I domain were to the success of Naval Aviation, so my highest priority became improving the partnerships across NAVWAR, NAVAIR and Naval Sea Systems Command so we could deliver integrated warfighting capability from seabed to space.

That point was also driven home while I worked with the F-35 team, where I again saw the importance of working together as a team, across services, if we're going to be successful.

In both roles, I cherished the teams' diverse thoughts, expertise and experiences, because they opened my aperture on different ways of looking at the problem. I think that is key to our continued success at NAVAIR.

Once back at NAVAIR, I saw a great team, in partnership with Commander, Naval Air Forces (CNAF), Commander, Naval Air Force Atlantic (CNAL), OPNAV and the fleet, delivering game-changing capabilities. We must continue that great work going forward, because our adversaries are not slowing down.

What are NAVAIR's priorities?

My No. 1 priority is delivering the warfighting capability the fleet needs to win—at a cost we can afford. Foundational to that is partnerships and developing our workforce.

What our fleet needs to win is an integrated warfighting capability—a capability enabled through the integrations of networks, sensors, platforms and weapons. We are no longer in the business of delivering a single weapon, platform or network, but rather, an integrated warfighting capability that will require us to partner closely across programs, PEOs, systems commands (SYSCOMs), services and industry.

In addition, we must provide our workforce with modern hardware and software development tools, processes, infrastructure and environments, and the training to apply these development processes to deliver integrated



Then-Lt. Carl “Chebs” Chebi (pictured right) and Lt. David “Killer” Culler during their time at TOPGUN in 1992 in San Diego, Calif.

warfighting capabilities. I’ve been working with other SYSCOM commanders and industry to understand what best-in-class looks like so we can apply and scale their learning at NAVAIR.

What are NAVAIR’s focus areas, and how are you implementing them?

NAVAIR’s mission is to deliver the warfighting capability the fleet needs to win at a cost we can afford. To accomplish that, I set three focus areas for the organization: speed of capability delivery, affordability and availability.

Speed of Capability Delivery: While I was happy to see the USS Carl Vinson deploy with game-changing capability, we cannot rest on our laurels. We must continue to push the envelope to get capability to the fleet faster. The key to speed will be establishing architectures, infrastructure and processes to enable rapid insertion, integration, testing and fielding of new technology. We must modernize how we develop, integrate, test and field hardware and software.

From a software perspective, we’re architecting our systems so the hardware is disaggregated from the software, which allows us to update systems hardware and software asynchronously. We’re also implementing other modern software development processes so we can get away from what I call tightly integrated “spaghetti code,” which is hard to update rapidly.

On the hardware side, we’re architecting our systems using open standards/reference architectures—think USB or HDMI—to enable rapid insertion of new technology into our weapons and platforms. We’re also developing and leveraging modeling and simulation environments early in development so we better understand the system’s performance and can make necessary changes before they become costly.

Foundational to our success will be a workforce trained with the right tools and processes, and a digital environment connected with industry at the right security levels, to allow our teams to work collaboratively.



Photos courtesy of Vice Adm. Carl P. Chebi

Chebi conducts cyclic flight operations with Carrier Air Wing (CVW) 7 during his 1992 deployment on USS Dwight D. Eisenhower (CVN 69).

Affordability: The cost to operate and sustain our fleet is outpacing our projected budgets. We have three primary initiatives to get after affordability: 1) cost transformation; 2) long-range cost targets; and 3) focus on sustainment up front in new programs.

Cost transformation is a Naval Aviation Enterprise (NAE) effort to ensure our dollars achieve winning outcomes. This is an opportunity to look at how we deliver capability and think differently about the problem, focusing on the value of each dollar spent as it relates to the capability outcomes we need.

Additionally, our program managers are identifying the root cause of each sustainment cost driver and are implementing changes in processes, training, procedures or investments today that will reduce future sustainment cost growth. These long-range should-cost plans are critical to arresting the growing sustainment costs and getting them on a downward trajectory.

Finally, we’re putting a focus on sustainment early in new development programs, when we have an opportunity to change the design and maintenance concept. This is a cultural shift across NAVAIR that will change how we look at affordability.

Availability: The NAE team—NAVAIR, Naval Supply Systems Command, CNAF, CNAL, the Fleet Readiness Centers and the fleet—have worked collectively to get after availability. By implementing commercial best practices via Naval Sustainment System-Aviation (NSS-A) principles, the NAE team has improved the availability of the F-18 fleet dramatically.

We changed how we looked at the problem and how we tried to solve it. In a “get real, get better” approach, the team identified the root cause of readiness degraders and applied commercial best practices to address them. They stood up an operations center, improved repair velocity, reformed maintenance procedures and identified systemic readiness degraders.

On average, we have approximately 100 more mission-capable aircraft available today than we did just a couple of years ago—put another way, by implementing NSS-A principles, we have an additional \$5 billion worth of available F-18 E/Fs for our warfighters.



Photo courtesy of Vice Adm. Carl P. Chebi

Chebi poses for a photo in the cockpit of a P-51 Mustang circa 1995 at the United States Naval Test Pilot School at Naval Air Station Patuxent River, Md.

Today, we are scaling our learning from the F-18 and applying it to other aircraft to improve both mission capable and full-mission capable rates. Overall, we have seen a significant increase in both rates across all type/model/series—a testament to the team’s great work.

What do you know about NAVAIR now that you didn’t when you were in the fleet?

When I wrote hazard reports as the safety officer for Strike Fighter Squadron (VFA) 192, I made recommendations for COMNAVAIRSYSCOM. I didn’t know who that was or what they did. Now that I am COMNAVAIRSYSCOM, I fully understand what this great team does every day to deliver warfighting capability the fleet needs to win at a cost we can afford.

I understand how committed the NAVAIR team is to ensuring our Sailors and Marines have what they need to execute their missions and return home safely. I understand how important it is for the NAVAIR team to partner with the other SYSCOMS, services and industry, large and small, to deliver the best solutions possible.

Finally, I understand how important it is for fleet aviators to join the NAVAIR team so we stay closely aligned, better understand their needs and have experienced aviators as part of the team that is going to deliver the next generation of capability to our future warfighters. 🇺🇸

A native of Holliston, Massachusetts, **Vice Adm. Carl P. Chebi** earned a Bachelor of Science in computer systems engineering and a commission as an ensign from the Naval Reserve Officer Training Corps at Rensselaer Polytechnic Institute. A graduate of the U.S. Naval Test Pilot School (USNTPS) and Navy Fighter Weapons School, he holds an Executive Masters in business administration from the Naval Postgraduate School.

Chebi served operationally as an F-14 pilot in Fighter Squadron (VF) 142 deployed with USS Eisenhower (CVN 69) and as executive officer and commanding officer for Strike Fighter Squadron (VFA) 192 deployed with USS Kitty Hawk (CV 63) to Atsugi, Japan. He participated in Operation Southern Watch and many Western Pacific deployments.

Shore tours include service as an aircraft and weapons test pilot in both Air Test and Evaluation Squadron (VX) 23 and VX-30 and as deputy for Strike Aircraft Plans and Requirements for the Office of the Chief of Naval Operations (OPNAV).

Chebi completed numerous acquisition tours beginning with USNTPS, where he flew the Mirage 2000 aircraft in France. His program management experience includes serving as a deputy program manager for the F/A-18 and EA-18G Program Office (PMA-265); program manager for the Precision Strike Weapons Program Office (PMA-201), and the Naval Integrated Fires Program (PMA-298). He served as vice commander for NAVAIR; the Program Executive Officer (PEO) Command, Control, Communications, Computers and Intelligence/PEO Space Systems; and recently as deputy program executive officer, F-35 Lightning II Joint Program Office.

Chebi has 3,700-plus flight hours, more than 700 carrier-arrested landings and logged hours in the F/A-18 A-F, Mirage 2000, F-14A-D, F-15, F-16, P-51 and numerous other aircraft.

He is the recipient of the Distinguished Service Medal, Legion of Merit, Meritorious Service Medal and various unit and sea service awards.

Chebi assumed responsibilities as Commander, Naval Air Systems Command in September 2021. 🇺🇸



Grampaw Pettibone

*Gramps from Yesteryear:
March-April 2002*

Illustration by **Ted Wilbur**

Hot Rod Was Here, Too

An HH-46 Sea Knight made an enroute stop for refueling before continuing on to a landing zone, flying at 50 to 200 feet above ground level, to pick up some sea-air-land team members. The aircraft landed at the destination and disembarked a squadron cameraman to videotape the helo making practice approaches to the landing zone.

The copilot was at the controls. He flew two approaches and was on the third when trouble started. He flew a low-level, high-speed, side-flare approach. In a nose-high attitude the pilot transitioned to a side flare with excessive angle of bank. The Sea Knight rapidly lost airspeed and subsequently also lost lift. Exacerbating the situation was the loss of wind effect and the high ambient temperature.

Settling toward the runway the pilot attempted a recovery. He rapidly increased collective but the engines could not spool up fast enough. This led to rapid rotor rpm decay. The aircraft struck the ground 15 degrees nose up in a 40-degree angle of bank, moving down the runway. The port outboard main gear mount tire skidded 10 feet. The main landing gear scissors broke and the main landing gear tires rotated 90 degrees. The aft rotor blades struck the ground six times.

The engines then spooled up, restoring rotor rpm. The aircraft became airborne, continuing a few feet above the ground for a distance of 100 feet from the initial impact point. The aircraft was flying in a relatively level attitude but with the nose rotated 120 degrees left of the runway heading. The helo was vibrating violently when it fell a few feet to the deck, at which point the auxiliary nose wheel collapsed. Next, the nose struck



the ground, the forward rotor blades drooped and two blades impacted the ground. Excessive vibration made securing the engine control levers difficult

but the pilots finally secured them after numerous attempts. The rotor system coasted to a stop and the crew egressed unhurt. ✈

Grampaw Pettibone says...

Pass me the bicarb! My head's poundin' as if the Sea Knight was vibratin' inside it. The pilot in command didn't bother to brief for the impromptu photo op. Neither did he obtain permission from his command. Nor did he restrain his copilot from this adventurous approach and landing.

The copilot failed to arrest the helo's rate of descent and didn't consider the effect of high temperature and wind loss during the landing sequence. This led to insufficient power during the transition from approach to landing. The copilot, it turns out, was soon to be released from active duty. This sortie was a last chance to demonstrate his skills.

There's one age-old word that describes this flight which turned into a calamity. Pure and simple, these folks were "flathatting"—and they got caught! ✈



F-35 Joint Program Office Completes Initial Deployment of Improved Logistics Hardware

ARLINGTON, Va.—In January, the F-35 Joint Program Office (JPO), in partnership with Lockheed Martin, achieved another milestone in the transition of the Autonomic Logistics Information System (ALIS) to the modernized F-35 Operational Data Integrated Network (ODIN) logistics information system by fielding the first 14 sets of new ODIN hardware to F-35 squadrons on schedule, and within budget.

Beginning in July 2021, personnel from JPO, Lockheed Martin and local squadron crews installed the new computer hardware, called the ODIN Base Kit (OBK), at sites in the United States and in Europe. This completes the initial phase of ODIN hardware rollout, replacing all first-generation unclassified ALIS servers in the field.

Successfully fielding OBK hardware overseas as well as at locations in the United States signifies major progress and international suitability of the new F-35 logistics information system architecture for global fleet operations. In addition to recent installations in the United Kingdom and Italy, two of the three OBKs installed in December 2021 at Edwards Air Force Base, California, support U.S.-based test operations for the United Kingdom and the Netherlands.

“Recent global OBK installations mark a major milestone in modernizing the F-35 logistics information systems in support of global operations,” said F-35 Program Executive Officer, Lt. Gen. Eric Fick. “This was a team effort between DOD, defense industry and our F-35 Partners, and is a giant step forward in support of international logistics and operational management of the global and expanding F-35 fleet.”

In addition to the 14 OBKs deployed as part of this effort there is one supporting the Marine Operational Test and Evaluation Squadron (VMX) 1 at Marine Corps Air Station Yuma, Arizona, and another supporting the F-35 Integrated Test Force’s (ITF) flight test operations based at Naval Air Station Patuxent River, Maryland.

OBKs are now in use by all three U.S. services that operate the F-35—Air Force, Navy and Marine Corps. OBKs are also in use by three F-35 partner countries—the United Kingdom, the Netherlands and Italy. The new hardware is supporting operational, training, and test and evaluation squadrons..

Additional OBK units are set to be delivered in 2022 as the



The Operational Data Integrated Network Base Kit.

F-35 program’s global logistics infrastructure continues to expand.

Designed by Lockheed Martin, the OBK replaces the legacy ALIS computer hardware called the Standard Operating Unit-Unclassified (SOU-U) server. The new ODIN hardware is 75 percent smaller and lighter than previous hardware and was procured at nearly 30 percent lower cost. The new OBK unit is designed to run both ALIS software, as well as future ODIN software applications.

The installations at each of the sites were accomplished by uni-

formed military maintenance personnel, assisted by experts from JPO and Lockheed Martin, with the systems ready for operation in a matter of days.

“This new server hardware has proven to be a valuable successor to the aging ALIS system hardware, one that offers a significant performance upgrade, at lower cost and in a readily supportable package,” said Air Force Col. Dan Smith, JPO maintenance systems program manager charged with overseeing ALIS and ODIN. “OBK allows us to replace hardware before obsolescence issues become critical and it allows us to provide better service to the maintainers.”

As announced by DOD in early 2020, ODIN is the planned replacement for ALIS. The successful fielding of ODIN hardware is an important step in the evolution to a modern, capable, portable and affordable logistics information system for the F-35 fleet.

“We’re excited about the improvements ushered in by the ODIN Base Kit in 2021 and look forward to outfitting the entire fleet with this enhanced capability as schedules and funding permit. OBK feedback has been overwhelmingly positive and will save our F-35 maintainers time and operating costs throughout the maintenance lifecycle,” Smith said.

Looking ahead, JPO and Lockheed Martin are working together to further extend affordability and performance advantages of the OBK, by designing and evaluating improved hardware for classified functions, and by further reducing the workload of system administrators at OBK sites. The JPO will complete the design and begin replacement of the classified OBK hardware in late 2022.

“These benefits will be realized as the OBK is extended across the entirety of the F-35 fleet,” Smith said.

From the F-35 Joint Program Office Public Affairs. 🇺🇸



U.S. Marine Corps photo by Capt. Charles Allen

The ordnance department of Marine Wing Fighter Attack Squadron (VMFA) 314 works diligently to refuel and load their F-35C Lightning II with the AIM-120 advanced medium-range air-to-air missile (AMRAAM). VMFA-314 performs simulated offensive and defensive air operations, as well as close air support training missions.

F-35C Brings Advanced Strike Capabilities to Jungle Warfare Exercise

SAN DIEGO, Calif.—As 3rd Marine Division recently commenced Jungle Warfare Exercise 22 (JWX 22), a large-scale, joint force exercise, Marine Wing Fighter Attack Squadron (VMFA) 314 integrated the capabilities of the F-35C Lightning II. VMFA-314 supported ground operations from their position deployed onboard the Nimitz-class aircraft carrier USS Abraham Lincoln (CVN-72), displaying their ability to deliver long-range strike capabilities and close air support from an aircraft carrier.

VMFA-314, the first Marine squadron to deploy the F-35C, continued to demonstrate its proficiencies during JWX 22 by conducting simulated offensive and defensive air support, as well as air-to-ground support training missions alongside the Marines of 1st Marine Air Wing, Japanese Air Self-Defense Forces and the Abraham Lincoln Carrier Strike Group in support of Expeditionary Advance Base Operations (EABO).

“The opportunity to work alongside Navy and Japanese Air Self-Defense Forces allows us to demonstrate our forward presence and to showcase our readiness to support real world opera-

tions,” said Lt. Col. Brendan M. Walsh, VMFA-314 Commanding Officer.

“Leveraging the Marine Corps’ decade of experience with the F-35B, we have spent the last two years working with the Navy to ensure the successful integration of the F-35C into the Carrier Air Wing and are now able to provide improved battlespace awareness and unmatched lethality.”

The integration of VMFA-314 and the F-35C into the Carrier Air Wing enables U.S. naval forces the ability to launch and recover fifth-generation aircraft from nearly anywhere in the world and to relocate to new strategic locations. The employment of the F-35C provides Marine ground units stealth capabilities and combat power to create the conditions for follow-on operations within key maritime terrain.

Exercises such as JWX 22 allow squadrons operating the F-35C to integrate tactics in conjunction with ground forces to help advance expeditionary capabilities such as EABO. These rehearsals of engagements will serve to reduce response times of forward-deployed units and support

the continued prosperity, security and promise of a free and open, rules-based order for the U.S. and its alliances and partnerships.

With continued deployments of fifth-generation fighters onto highly mobile aircraft carriers, the F-35C is able to provide precision long-range strike capabilities to allies while also garnering valuable intelligence from areas of operation, all while operating from at-sea or shore-based austere environments.

VMFA-314 was the first Marine Corps squadron to transition to the F-35C variant of the joint strike fighter after retiring its legacy F/A-18A/C aircraft and receiving its first F-35C on Jan. 21, 2020. Now as the Marine Corps continues to develop as a modernized naval force, deploying squadrons such as VMFA-314, to key strategic maritime locations demonstrates the Marine Corps’ capability to deter adversary aggression, and if required, decisively win in conflict.

Written by Capt. Charles Allen, 3rd MAW Communication Strategy and Operations Office. 🦅

Navy to Demo New MQ-8 Fire Scout Mine Countermeasure System

PATUXENT RIVER, Md.—The Navy is working to develop a new mine countermeasure (MCM) sensor suite for the MQ-8C Fire Scout that will enable the unmanned helicopter to detect and localize mines and obstacles on land and at sea.

The Fire Scout program office, in conjunction with the Office of Naval Research (ONR) and Program Executive Office Unmanned and Small Combatants (PEO (USC)), partnered with the Naval Air Warfare Center Aircraft Division's (NAWCAD) AIR-Works, Aircraft Prototype Systems Division (APSD), Webster Outlying Field (WOLF) and Air Test and Evaluation Squadron (UX) 24 to execute the final phase of the Single System Multi-Mission Airborne Mine Detection (SMAMD) Future Naval Capability Program.

SMAMD will be the first MCM system flown onboard the MQ-8C Fire Scout as well as the airframe's heaviest payload carried to date. The SMAMD system, developed by BAE Systems, utilizes an airborne optical sensor suite that will have the ability to have real-time onboard processing coupled with low false-alarm rates and will enable the warfighter to respond swiftly to detected threats. Current MCM technologies require post-mission analysis that lengthens the threat detection and mitigation timeline.

"This capability is extremely important as we see future fights occurring in the littoral waters where mine warfare is prevalent," said Capt. Thomas Lansley, Fire Scout program director. "A mine warfare capability will greatly reduce risk for [littoral combat ships]."

In February, UX-24 conducted Flying Qualities and Perfor-

mance (FQ&P) testing with the MQ-8C using mass equivalency models in place of the prototype system pods, which mimic the size and weight of the SMAMD System. FQ&P testing is performed to collect data to allow for the evaluation of air vehicle performance and handling to assess safety of flight and airworthiness.

This spring, the joint team will hold a land-based demonstration of the MCM prototype at the Naval Surface Warfare Center in Panama City, Florida. The demo will stretch from the beach zone, detecting drifting mines and moored mines both in shallow water and deep water up to 10 kilometers offshore. The objective of the demonstration is to gather performance data for both the MQ-8C Fire Scout and SMAMD to inform future integration efforts.

The SMAMD will prove that a podded MCM system can operate as intended on the MQ-8C without causing adverse effects to the Unmanned Aerial Vehicle or significantly diminishing time on station.

"The program office will continue to gather information to inform future integration efforts of the COBRA Block II System onto the MQ-8C," Lansley said.

The MQ-8C Fire Scout is currently deployed aboard USS Milwaukee (LCS-5) to support operations in the U.S. Fourth Fleet area of responsibility. Fire Scout delivers real-time intelligence, surveillance, reconnaissance and targeting capabilities. It increases the fleet's situational awareness in distributed maritime operations, extending the ship's sensors range and endurance.

From the Multi-Mission Tactical Unmanned Aerial Systems (UAS) Program Office. 🦅

The MQ-8 Fire Scout, with mass shapes attached, conducts low airspeed flying qualities testing in February at Webster Field, Maryland, to prepare for upcoming the Single System Multi-Mission Airborne Mine Detection (SMAMD) demonstration.



U.S. Navy photo

Navy's MQ-8C Fire Scout Deploys with Radar Upgrade Aboard USS Milwaukee



U.S. Navy photo by MC2 Danielle Baker

An MQ-8C Fire Scout attached to the "Sea Knights" of Helicopter Sea Combat Squadron (HSC) 22, Detachment 5, takes off from the flight deck of the Freedom-variant littoral combat ship USS Milwaukee (LCS 5), Jan. 6.

PATUXENT RIVER, Md.—The Navy's upgraded MQ-8C Fire Scout deployed Dec. 14 aboard USS Milwaukee (LCS-5) to support operations in U.S. 4th Fleet area of responsibility.

"We are very excited to bring this enhanced capability out to the fleet," said Capt. Eric Soderberg, MQ-8 Fire Scout program manager. "Our team has been working closely with the ship for several months to ensure this deployment is a success."

MQ-8 Fire Scout is the Navy's only unmanned helicopter, designed to deliver real-time intelligence, surveillance, reconnaissance and targeting capabilities. Fire Scout brings increased situational awareness to the fleet in

distributed maritime operations, extending the ship's sensors range and endurance.

While underway, Helicopter Sea Combat Squadron (HSC) 22, Detachment 5, will employ Fire Scout and an embarked MH-60S Seahawk to conduct counter-narcotics operations. Fire Scout will identify targets of interest and refine surveillance data of existing targets of interest, allowing for enhanced capabilities for counter illicit drug trafficking missions.

"Fire Scout is a force multiplier, not only in our current mission, but in every mission the U.S. Navy conducts," said Cmdr. Brian Forster, commanding officer of Milwaukee. "I am very

excited about the team I have onboard which has already, and will continue to, demonstrate how manned and unmanned assets can work together to effectively achieve the mission."

The latest variant, MQ-8C, has a greater payload and endurance than its predecessor and is equipped with the Leonardo Osprey AN/ZPY-8 radar that significantly increases Fire Scout's ability to identify, detect and track targets. The upgraded radar allows for a larger field of view and range of digital modes.

The MQ-8C is also set to deploy in the Western Pacific later this year.

From the Multi-Mission Tactical Unmanned Aerial Systems (UAS) Program Office. 🦅



U.S. Navy Photograph by Erik Hildebrandt

The Airborne Strategic Command, Control and Communications Program Office provides products and services that meet E-6B Mercury and future aircraft operational requirements to enable survivable, enduring and reliable communications.

E-6B Continues Providing Nuclear Communications Link, Looks to Future

PATUXENT RIVER, Md.—The E-6B Mercury provides an important link in the nation's strategic nuclear deterrence. It allows survivable communication between the president and the triad of nuclear weapon systems—bombers, missile fields and ballistic missile submarines.

Sustaining this mission while preparing for the future is becoming even more important as global competition grows.

"This is a critical time for our country," said Chief of Naval Operations Adm. Mike Gilday in a prepared statement Jan. 12 to the House Appropriations Committee. "The People's Republic of China and Russia are using all elements of their national power to undermine U.S. interests in the global commons."

Keeping the link of communication open is a "no-fail" mission and one the Airborne Strategic Command, Control and Communications Program Office continues to help accomplish by sustaining the E-6B while also preparing for the future with a recapitalization aircraft.

"Our people understand the mission and the importance of sustaining this vital asset," said Capt. Adam Scott, program manager. "They know why these aircraft always need to be ready to go."

During the past year, the program office made several significant sustainment efforts to support the fleet. Spar chord corrosion and stress corrosion

cracks were discovered during in-service and depot maintenance. The current spar chord material became obsolete and the team quickly qualified a new material. Manufacturing new spar chords required converting the original 2D drawings into 3D digital files.

An additively manufactured fuel dump manifold was approved for use on the aircraft. The component replaces casted hardware that has been a sustainment concern while saving lead time over the redevelopment of traditional casting tooling.

"Being able to look at and attack these sustainment issues as an enterprise has really helped us," Scott said. "The collaboration across the Naval Aviation Enterprise has been invaluable."

In September, the fully qualified additively manufactured water separator was approved for use on fleet aircraft. The units are replacing legacy separators that had been a top concern for the past two years.

The program procured a United Kingdom E-3D for use as an E-6B trainer aircraft, which will help increase aircraft availability and readiness.

"The aging aircraft is making it more of a challenge to maintain, but we continue to find ways to get the job done and provide operational readiness," Scott said.

The airframe has been around for more than three decades with the Navy accept-

ing the first E-6A in 1989 to perform the Take Charge and Move Out (TACAMO) mission. The aircraft were then modified into the E-6B with added workstations and specialized equipment. The first E-6B aircraft arrived in 1997 with the fleet modification complete by 2003.

"Sustaining our readiness has never been more vital to our nation's future," Gilday said. "Meanwhile, our force design requires a relentless focus on modernization to keep our platforms relevant."

With that in mind, the program has been working on a recapitalization aircraft (E-XX) that will take over the TACAMO mission. The program will use a variant of the militarized C-130J Super Hercules for E-XX TACAMO testing.

The Department of Defense currently uses the C-130J in multiple services, and it is deployed at various bases worldwide. The program office will be acquiring three non-configured aircraft for testing.

The program is also working on communications and mission systems integration contracts for the recapitalization aircraft to help modernize the strategic nuclear deterrent.

"For the nation and our allies, we are making sure the president can reach our strategic forces now and in the future," Scott said.

From the Airborne Strategic Command, Control and Communications Program Office. ✈

HMH-461 Conducts Redesignation Ceremony

NEW RIVER, N.C.—Marine Heavy Helicopter Squadron (HMH) 461 held a redesignation ceremony Jan. 24 at Marine Corps Air Station New River, North Carolina.

The squadron received its first CH-53K King Stallion, and the ceremony signified the beginning of the Marine Corps' modernization from the CH-53E Super Stallion to the CH-53K King Stallion in support of the expeditionary warfare vision for future-force employment.

The CH-53E supported heavy-lift and troop-transport operations across the globe since 1981. With the implementation of the CH-53K, the Marine Corps will have a better ability to mass combat power quickly with its heavy-lift capability while maintaining a global amphibious presence, making it an important asset to respond to any conflict around the world.

"The CH-53K is the new advanced platform replacing the CH-53E, which is aging," said Lt. Col. Adam A. Horne, commanding officer of HMH-461. "The CH-53K King Stallion will take 2nd Marine Aircraft Wing (MAW) and the Marine Corps into the future."

Gen. David H. Berger, 38th commandant of the Marine Corps, set forth the vision of the future in his planning guidance, which was published in July 2019. In his guidance, Berger committed to reshaping the capabilities of the Marine

Corps to become optimized for naval expeditionary warfare in contested spaces, to facilitate sea denial and to support the various fleet forces. The transition from the CH-53E to the CH-53K will provide the Marine Corps optimized vertical, heavy-lift, sea-based helicopters with the ability to fly longer distances, carry more ground troops and carry heavier loads to take on challenges in future conflicts.

"Today, our Marine Corps got a little stronger," said Maj. Gen. Michael Cederholm, commanding general of 2nd MAW. "Placing the CH-53K King Stallion into the hands of our warfighters will ensure we capitalize on the unique qualities and characteristics of the 53K, and will allow 2nd MAW to continue to provide the best aviation support to the Marine Air-Ground Task Force (MAGTF) right now, and well into our future. ... We continue to become a more modernized and lethal force so, when the time comes, we will deliver on II Marine Expeditionary Force's motto: 'Come to Fight—Come to Win.'"

The increased heavy-lift capability of the CH-53K is unprecedented within the MAGTF and joint force in support of the National Defense Strategy.

Written by Sgt. Servante Cobra, 2nd Marine Aircraft Wing. 🦅



A CH-53K King Stallion (right) and a CH-53E Super Stallion are staged during a redesignation ceremony at Marine Corps Air Station New River, North Carolina, Jan. 24.

U.S. Marine Corps photo by Lance Cpl. Elias E. Pimentel III

NAWCWD Researchers Break Ground in Magnetic Molecules

CHINA LAKE, Calif.—Dr. Randall McClain and Dr. Ben Harvey, research chemists working for Naval Air Warfare Center Weapons Division (NAWCWD), published groundbreaking research in the field of single molecule magnets in the Jan. 14 edition of *Science* magazine, the flagship journal of the American Association for the Advancement of Science.

“Science is one of the most prestigious U.S.-based scientific journals,” Harvey said. “The articles need to describe groundbreaking work that is of interest to all scientists, and most scientists never get this opportunity.”

NAWCWD researchers began studying single molecule magnets (SMMs) in late 2017. At the time, McClain was a National Research Council Postdoctoral Fellow who has since transitioned to a full-time NAWCWD employee, and synthesized and characterized the SMMs while Harvey served as the principle investigator, directing the research and mentoring McClain during his fellowship and subsequent transition to full-time federal service. He also directed the research program and helped establish collaboration partnerships with academic organizations.

Conventional magnets, like those on a refrigerator or the powerful rare earth-based magnets used in computer hard drives, are composed of a network of inorganic structures with aligned electron spins. In contrast, SMMs are magnetic molecules that possess an energy barrier to re-orientation of their molecular spin. These molecules produce localized magnetic fields and are essentially the smallest possible magnets. These materials have the potential to greatly increase the magnetic storage density of hard drives or to induce magnetic fields with incredible precision, potentially enabling the development of novel components useful for quantum computers.

However, despite the promise of SMMs, these exotic materials can be easily disrupted by their environment, which eliminates



Dr. Randall McClain, left, and Dr. Ben Harvey stand in front of a single crystal X-ray diffractometer, which is used to determine the chemical structure of molecules.

U.S. Navy photo by Ryan Smith

their magnetic behavior, McClain said. In fact, most SMMs only exhibit their magnetic properties at temperatures near absolute zero. McClain’s work has shown that by controlling the SMM environment through molecular design, operating temperatures up to 80 kelvin can be realized. This advance makes the use of SMMs feasible in practical devices.

McClain and Harvey synthesized a series of novel lanthanide dimers that exhibit lanthanide-lanthanide bonds, a bonding interaction not previously described in the literature. This interaction aligns the magnetic moments of the metal centers.

“Using dysprosium as the lanthanide resulted in the best SMM ever created by any comparative metric,” Harvey said. “This new material exhibits slow magnetic relaxation at high temperatures and has an extremely high barrier to magnetic reversal. This type of hard magnetism at elevated temperature is unprecedented for SMMs and represents a major breakthrough. Leveraging collaborations with academic institutions can deliver next-generation materials and devices for use in both commercial and DOD applications,” he said.

The NAWCWD team collaborated with academic partners, with researchers at the University of California, Berkeley, conducting the magnetic characterization of the molecules and researchers at the University of Manchester, United Kingdom, conducting calculations to support and explain the team’s experimental results.

“This disruptive technology showcases the diverse talent of the Research Department at NAWCWD and is just one more example of the continued outcome-based focus our researchers have for the safety of the United States,” said Harlan Kooima, NAWCWD’s Research and Development Group director.

“High performance SMMs and related molecules offer the promise of transformational advances in data storage, high performance computing and quantum information science, all areas of crucial strategic importance,” Harvey said, noting that researchers at NAWCWD are continuing this line of research with the hope of transitioning to the fabrication and testing of devices based on the new SMMs.

From Naval Air Warfare Center Weapons Division public affairs. 🦋

Air-to-Air Missiles Program Office Names Italy as 28th International Partner

PATUXENT RIVER, Md.—The Air-to-Air Missiles Program Office acquired Italy as its 28th Air Intercept Missile (AIM)-9X International Partner Dec. 17.

The Italian Embassy in Washington, D.C., notified the Navy International Programs Office that the Italian Air Force accepted and signed the Letter of Offer & Acceptance (LOA) provided by the United States Government.

Italian Air Force officials signed the LOA Nov. 19, and shortly after, representatives from the program office and Raytheon Missiles & Defense presented the AIM-9X Block II/II+ Classified Capabilities Briefing to Italian Headquarters Air Force Staff and F-35 Lightning II pilots.

This LOA consists of a modest quantity of AIM-9X Block II/II+ missiles to complement its F-35 fleet. This procurement will be part of the Navy's Lot 23 Production Contract, which will award in 2023 and deliver missiles in 2026.

Additionally, the Italian Navy, which also operates the fifth-generation fighter aircraft, has been provided with a separate LOA for Lot 23 AIM-9X Block II/II+ missiles, and is expected to accept it soon. Italy will receive AIM-9X missiles that will employ the true fifth-generation Block II/II+ capabilities of Lock-On-After-Launch, Data Link and Surface Attack.

Written by Katie Ursitti, Air-to-Air Missiles Program Office communications. 🦅



Photo courtesy of Lockheed Martin

CH-53K Test Team Wins DON T&E Award

PATUXENT RIVER, Md.—The CH-53K King Stallion test team, part of the Heavy Lift Program Office, is the recipient of the Department of the Navy Test and Evaluation Working Integrated Product Team (WIPT) award for 2021.

The 18-person WIPT will be honored in a virtual ceremony this spring. According to the award announcement, the team, “demonstrated superior performance in delivering outcomes while overcoming significant challenges in execution.”

During the past year, the CH-53K King Stallion WIPT successfully kept the program on track toward Operational Test (OT) in support of Initial Operational Capability (IOC) and Full Rate Production. That success came despite late technical discoveries, solution implementation timelines and some unresolved deficiencies.

When findings surrounding internal cargo handling in the aircraft and engine performance capabilities put program timelines at risk, the team was able to leverage the close alignment of Developmental Test and Operational Test within the WIPT to keep the program on track.

“Our team did a fantastic job collaborating and focusing efforts to bring the CH-53K to Operational Test, supporting the fleet’s critical need for heavy lift capability,” said Gene Clark, former Assistant Program Manager for Test and Evaluation for the program office in 2020 and 2021. Clark drafted the award nomination prior to moving to his current position as Assistant Program Executive Officer, Test and Evaluation for Program Executive Office Unmanned and Weapons.

Strong collaboration, concise communication and an extraordinary analytical effort by the team culminated in a successful entry of the CH-53K into OT in July. The WIPT’s efforts ensured the best possible product was tested and the program remains on track to enter IOC this summer, looking to first fleet deployment in FY24.

From the H-53 Heavy Lift Helicopters Program Office. 🦅



A CH-53K King Stallion aircraft undergoes night aerial refueling tests over the Chesapeake Bay in June, 2021.

U.S. Navy photo

New Marine Corps Expeditionary Matting Passes the Test

PATUXENT RIVER, Md.—Expeditionary Airfield (EAF) Landing Systems teams from the Aircraft Launch and Recovery (ALRE) Program Office are testing solutions that will make Marine expeditionary landings easier and faster.

ALRE's EAF team spent two years searching for a reliable replacement for AM2 Vertical Takeoff and Landing (VTOL) matting, which has been in service since the 1960s. While AM2 remains a viable solution, it's heavy, time-consuming to install and challenging to deliver to austere environments.

to secure the matting system to the ground to support VTOL operations.

The benefits of the new lightweight matting offer substantial reductions in weight and ease of setup for U.S. Marines: this lightweight matting is also the first viable replacement test teams have found for the United States' NATO partners, who per OSHA standards, cannot lift and place the existing 12-foot panels of AM2, which are about 150 pounds. The lightweight matting panels offer a one-man lift to service members from all NATO countries, while all the panels and installation equipment for an

tem would react to Marine Corps aircraft; we surpassed all expectations we presented beforehand."

Clint Hunt, EAF Contract Service Support, said the reduction in groundwork and preparation before laying the mats will be transformative for EAF teams.

"We no longer have to bring in graders, bulldozers or drafting and survey teams; lightweight matting conforms to the ground," Hunt said. "We can take away that whole aspect of heavy equipment and focus on moving toward the expeditionary goal of the Marine Corps."

The new anchoring system can also be installed using exclusively commercial tools, which are included in the manufacturer's box. This ensures the teams are not burdened with packing accessory kits. Previous anchoring systems involved 6-foot long, 4-inch-wide cruciform stakes, which Marines drove into the ground, attached to anchors and tied to the matting—a multi-step process that required a jackhammer and front-end loader.

"Freeing ourselves of hydraulic tools in the desert is greatly beneficial; sand is not a favorable environment for hydraulics, and with the addition of the heavy equipment, installation takes five times longer," Hunt said. "The installation for lightweight matting required a simple electric hammer wrench and drilling the new screws into the ground. When teams are driving 80-plus stakes into the ground, the time adds up. Now we can install five or so at a time."

Hunt said the testing in 2021 built confidence and provided proof of concept of commercial possibilities available to the Marine Corps.

"Testing in Yuma brought everything together—installation, expectations, timelines—and it all worked out exactly the way the Marine Corps hoped it would," Hunt said. "Both the concept and product meet in line with the National Defense Strategy and the 2019 Commandant's Planning Guidance,

Expeditionary Airfield Landing Systems teams from the Aircraft Launch and Recovery Program Office worked with Marines from Marine Operational Test and Evaluation Squadron (VMX) 1 and operational aircraft from the 3rd Marine Air Wing to test Prefabricated Surfaced Aluminum Flat Top Nested using an MV-22 Osprey.



U.S. Navy photo

Although the Marine Corps aimed to incorporate lightweight matting into service for years, research and work throughout 2020 and 2021 finally brought a promising commercial off-the-shelf (COTS) solution to the surface. Testing continues to prove the new lightweight matting's reliability and promise as the Marines' expeditionary matting of the future.

The most recent EAF testing in November at Marine Corps Air Station Yuma, Arizona, examined Prefabricated Surfaced Aluminum Flat Top Nested, which is a new variant of lightweight matting. Test teams also looked at new staking systems

entire VTOL pad fit into a single, standardized ISO container.

Chief Warrant Officer Chad McCammon, Military Deputy Integrated Product Team Lead for EAF, said November's testing brought many firsts to the search for a new airfield surfacing solution.

"In 2020, we tested smaller aircraft, and on this last round, we looked at some of the heavy and medium-sized aircraft—the CH-53 Sea Stallions and V-22 Ospreys," McCammon said. "Through the collaborative efforts of the fleet, the program office and our friends at the Penn State Applied Research Lab, we proved the engineers' theories and models true as to how the sys-

Marine Corps Joint Air-to-Ground Missile Achieves Initial Operational Capability



U.S. Marine Corps photo by Cpl. Gabrielle Sanders

U.S. Marine Corps Chief Warrant Officer 3 Michael Brawn, aviation ordnance officer, Marine Operational Test and Evaluation Squadron (VMX) 1, loads a joint air-to-ground missile (JAGM) onto an AH-1Z Viper during an operational test at Marine Corps Air Station Yuma, Arizona, Dec. 6.

PATUXENT RIVER, Md.—The U.S. Marine Corps declared March 1 Initial Operating Capability (IOC) for the AGM-179A Joint Air-to-Ground Missile (JAGM) on the AH-1Z Viper.

JAGM, a joint program with the Army, is a precision-guided missile that combines semi-active laser guidance and millimeter-wave radar. It is an air-to-surface precision-guided munition (PGM) used on joint rotary-wing, unmanned aircraft systems and fixed-wing platforms to destroy high-value, stationary, and moving, land and maritime targets.

“IOC marks a major milestone for the JAGM program and significant increase in capability for the AH-1Z,” said Cmdr. J. Reid Adams, deputy program manager for precision-guided missiles. “This accomplishment is a true testament of the tireless efforts made by so many across DoD and our industry partners to support the warfighter.”

The JAGM program successfully completed a thorough Initial Operational Test and Evaluation period with a recommendation to field the missile. AH-1Z pilots tested JAGM off



U.S. Marine Corps photo by Cpl. Matthew Romonoyes-Bean

A U.S. Marine with Marine Operational Test and Evaluation Squadron One (VMX-1) arms a joint air-to-ground missile (JAGM) before take-off at Marine Corps Air Station Yuma, Ariz., Dec. 6.

the coast of Florida in November 2021 and conducted land-based testing in Arizona in December 2021.

IOC was achieved with missiles, training and support equipment delivered to Marine Light Attack Helicopter Squadron (HMLA) 267 to support an upcoming deployment with the 13th Marine Expeditionary Unit.

“Incorporating systems such as JAGM on the AH-1Z is essential in keeping the platform at the forefront of warfighting capabilities,” said Col. Vasilios Pappas, Marine Corps H-1 Light/Attack Helicopter program manager.

JAGM provides improved lethality, operational flexibility and a reduced logistics footprint to the H-1 platform. It is part of an effort to upgrade the AH-1Z and UH-1Y aircraft in alignment with the Commandant’s vision of force modernization to maintain a competitive edge against potential adversaries.

From the U.S. Marine Corps H-1 Light/Attack Helicopter Program Office. 🦋

which provides maneuverability for the fleet to utilize COTS products and field solutions faster.”

Matthew Schettino, test engineer for the program office, worked on AM2 replacement for several years. He credited his successful planning to teamwork and coordination between NAVAIR, the test instrumentation groups, pilots and aircraft from Marine Operational Test and Evaluation Squadron (VMX) 1, operational aircraft from the 3rd Marine

Aircraft Wing and collaboration with manufacturers.

“Our use of a COTS product is introducing another benefit; many of the manufacturers are based on the feedback we provided from the first and second rounds of testing,” Schettino said. “They did the design, but the result is really a product of our previous feedback and testing.”

McCammon said the team’s next steps include finishing the VTOL Capabilities Development Document (CDD) and

evaluating several other airfield surfacing solutions.

“If we hit all the wickets within the CDD, we will look to field this solution and give our Marines an opportunity to try them and give feedback,” McCammon said. “Further on down the road we will start working on short take-off and landing and finding new solutions for small runways with a VTOL pad.”

From the Aircraft Launch and Recovery Program Office. 🦋

Saberhawks Earn Phoenix Award for Superior Maintenance

ATSUGI, Japan—The “Saberhawks” of Helicopter Maritime Strike Squadron (HSM) 77 were awarded the Secretary of Defense’s Phoenix Award at Naval Air Facility Atsugi, March 3.

Top commands from the Navy, Marine Corps, Army and Air Force compete annually for the award that celebrates maintenance performance excellence.

According to DOD Instruction 1348.30, the award recognizes maintenance operations and accomplishments at the unit and program levels. Award categories include small, medium and large commands with two commands in each category able to win the award.

“It is incredibly humbling to have the good fortune to work alongside so many talented individuals,” said Cmdr.

Nicholas Cunningham, HSM-77 commanding officer. “That their efforts through the pandemic and double-pump deployments are recognized through the awarding of the Phoenix Award brings a tremendous sense of pride to the Saberhawks.”

HSM-77 was judged in several criteria including effective use of maintenance resources, innovative management accomplishment, personal quality-of-life programs and mission accomplishment.

“Despite the challenges that everyone across the Navy and Marine Corps faced during 2020, the Saberhawks were able to consistently complete all operational tasking while deployed for 270 days. The maintenance leadership managed personnel qualifications, aircraft maintenance schedules and worldwide supply logistics hurdles while disaggregated across two ships to exceed CNAF operational and material readiness standards,” said Lt. Cmdr. Haylee Coffee, HSM-77 maintenance officer. “The diligence and the dedication of the sailors assigned to HSM-77 continues to ensure that the Saberhawks are always ready to overcome the challenges faced in the FDNF environment in order to complete tasking in a professional and expeditious manner.”

With effective use of maintenance, personnel and financial resources, combined with an all-hands approach, the squadron has developed into a highly efficient maintenance team, and their reception of the Phoenix Award is proof that their performance exceeds standards.

HSM-77 is forward-deployed to the U.S. Seventh Fleet area of operations in support of security and stability and a free and open Indo-Pacific.

Written by Lt. Cmdr. Joseph Keiley, Commander, Task Force 70/Carrier Strike Group 5. 🦅



U.S. Navy Photo by YN2 Kelsey Terry

Capt. Michael Sweeney, commanding officer of Carrier Air Wing (CVW) 5, presents the Phoenix Award to Cmdr. Nicholas Cunningham, commanding officer of the “Saberhawks” of Helicopter Maritime Strike Squadron (HSM) 77, during a ceremony at the squadron’s hangar at Naval Air Facility Atsugi.

ONR Global, Royal Air Force Partner in First Synthetic-Fueled Drone Flight

LONDON, U.K.—Office of Naval Research (ONR) Global and Royal Air Force (RAF) Rapid Capabilities Office (RCO) conducted the first-ever drone flight using synthetic kerosene in February.

Performed in partnership with C3 Bio-technologies Ltd., in the United Kingdom, the British Royal Air Force and the U.S. Navy, successfully completed the first drone flight using synthetic kerosene as part of an ongoing effort to reduce the carbon footprint. Synthetic kerosene is entirely fossil fuel-free, made by mixing raw materials with high sugar levels (e.g. food waste with bacteria) to create an oil substance that is then converted into aviation fuel using chemicals and heat.

The four-meter-long fixed-wing drone completed a 20-minute test flight in Wiltshire (South West England), providing valuable data indicating the fuel performs consistently to a high standard.

Chief of Naval Research, Rear Admiral Lorin C. Selby said, “It is exciting and game-changing to work with our allies in the U.K. to develop a more efficient synthetic aviation fuel. The U.S. Navy is committed to finding innovative solutions to operational challenges, and the ability to manufacture this fuel without large infrastructure requirements would be groundbreaking for deployed forces.”

The origins of this historic flight go back to 2018. With the world looking toward electric propulsion or synthetic alternative fuels as solutions for commercial flight, ONR Global sponsored work to combine technology developed at the Naval Air Warfare Center in China Lake, California, and the University of Manchester in the United Kingdom to convert a little-known biological molecule into a high-performance, drop-in synthetic kerosene.

As the project progressed and turned into a viable and demonstrable solution for aviation, the technology was integrated

into the startup C3 Bio-Technologies Ltd. in 2020. The next step involved ONR Global partnering with RAF RCO to demonstrate this new capability, culminating in the groundbreaking flight in February.

This technology provides a viable solution today and leverages the nascent bio-manufacturing industry to create sustainable, secure and environmentally friendly products resilient to commercial market forces and geopolitical uncertainty.

“The RAF needs to ensure we are at the forefront of technology to safeguard our own resilience and operational capability, while minimizing any impact on the environment,” said RAF Air Vice-Marshal, Lincoln Taylor. “Fuel scarcity and cost will only ever increase in its impact on our operations, and synthetic fuels

for our aircraft are one potential solution to this situation as we look to secure the objectives of the next-generation RAF.”

The process

The power of this project lies in the fact that high-value platform molecules can be developed using proven bioengineering processes. Its concept revolves around engineering a halophilic bacteria to produce a high-value platform molecule that can easily be converted to high-performance fuels. The process can be made carbon neutral because the bacteria are maintained with a feedstock normally considered to be waste (e.g., food waste, solid waste, grey and black water and, someday in the future, plastics). The bacteria consume this feedstock to grow and produce the desired high-value product, circumventing the

costly, dirty and energy-intensive distillation processes upon which the conventional petro-chemical industry relies.

“This project is a prime example of how we can harness the power of biology to change the world as we see it today,” said Patrick Rose, lead ONR Global Science Director. “We should no longer disregard the critical importance of leveraging bio-manufacturing as a strategic investment for national security. Most important, however, was the team that helped make this possible. We were once again able to demonstrate to the world that ONR Global should be the partner of choice to enable disruptive new technology development.”

Engineering bacteria to replicate the same processes can be significantly more sustainable, as it reduces waste streams, limits the production of toxic byproducts and is not dependent on non-sustainable resources such as crude oil.

“Researchers at the Naval Air Warfare Center Weapons Division,

China Lake, have developed high-throughput chemical methods for the conversion of biologically produced linalool into a full-performance jet fuel blendstock,” said Dr. Benjamin G. Harvey, China Lake’s Senior Research Chemist and Associate. “The resulting fuel exhibits higher energy density and lower viscosity compared to conventional jet fuel.”

Synthetic biology involves taking engineering principles and applying them to biology, an interdisciplinary field in constant search of the next revolutionary discovery, finding new ways to reduce the impact of the global carbon production footprint, which is probably the most urgent challenge of today’s international scientific ecosystem.

ONR Global sponsors scientific efforts outside of the U.S., working with scientists and partners worldwide to discover and advance naval capabilities. 🚀



Photo courtesy of ONR Global

Navy League of the United States Hosts Sea-Air-Space Expo 2022

The Navy League of the United States hosted the 2022 Sea-Air-Space Exposition (SAS) April 4-6 to bring together defense industrial base, private-sector U.S. companies and key military decision-makers for an innovative, educational and professional maritime-based event at the Gaylord National Convention Center, National Harbor, Maryland.

The day prior, on April 3, the Navy League held a day-long STEM Expo where different exhibits demonstrated ideas and mechanics in the areas of science, technology, engineering and mathematics.

"This STEM Expo is designed to attract young men and women in our underserved communities," said Mike Stevens, retired master chief petty officer of the Navy and current CEO of the Navy League of the United States. "We want to introduce them to STEM in a maritime space. We'd love to one day see these young men and women become the ship-builders of America, the aircraft designers of America that support the sea services."

Day one of the SAS Expo started with a Chiefs Leadership Panel where Adm. Mike Gilday, chief of naval operations

(CNO), spoke alongside Gen. David Berger, commandant of the U.S. Marine Corps, and Adm. Karl Schultz, commandant of the U.S. Coast Guard. The panel discussed what maritime forces were doing to deal with growing threats of all types, evolving changes and challenges faced in the post-pandemic world.

"What it boils down to is fielding and investing in a combat creditable force that can deter," Gilday said. "If you look at the investments we're making in the force that we're fielding this decade, whether it's [in the] light amphibious warships or unmanned [technology], the transitions are really what we're hoping come alive in the 2030s. This is an evolutionary process, and I think the budget reflects that."

The CNO spoke on technologies equipped on Navy vessels and how the

budget gives life to key innovations. He addressed the warfighting front but didn't leave out the elements that aren't vessels.

"In the human weapon systems, the investments we're making in Ready Relevant Learning and live virtual constructive training are significant, in fact, groundbreaking," Gilday said. "In the space and cyber domain, we're making investments in afloat targeting cells that are groundbreaking in terms of what they deliver to the fleet commander in terms of being able to create effects downrange."

The panel of Navy Autonomy and Advanced Autonomous Technologies expanded on the production and development of unmanned surface and undersea vehicles. Rear Adm. Casey Moton, Program Executive Office, Unmanned and Small Combatants, moderated the panel



U.S. Navy photo by MC2 Nick Boris

Chief of Naval Operations (CNO) Adm. Mike Gilday talks about opportunities and obstacles while operating at sea, while Francis Rose listens during the 2022 Sea-Air-Space Exposition Opening Ceremony.



U.S. Navy photo by MC2 Nick Boris

Rear Adm. John Korka, commander of Naval Facilities Engineering Systems Command and the 45th chief of civil engineers, talks about optimizing shipyards with the use of Industry 4.0 Technologies during the Navy Shipyards of the Future event at the Sea-Air-Space 2022 Exposition.

and discussed the mission and functions of the new autonomy directive, how autonomy is integrated, and the implementation path ahead of the technologies.

“Some amazing things are going on around us in terms of technology,” Moton said. “If you think about advanced computing, artificial intelligence, advance networks and communications, all of these things are happening at the same time. I believe they are going to change the way we operate in the same way Naval Aviation changed the way we operated 100 years ago.”

Moton said he believes in Gilday’s vision of the Navy becoming a hybrid fleet of manned and unmanned vessels. This is a vision already being manifested. Moton said the unmanned systems that has fielded will become more capable and extensions of the battle force.

“They’re going to become the eyes and ears of the fleet,” Moton said. “They’re going to enable our Sailors and ships to become much more effective as a team. Sailors that work in oceanography already know we have a fleet of unmanned systems out there. Over the next five to 10 years, I believe you’ll see the Navy

transform into this hybrid fleet the CNO talks about.”

Day two kicked off with a women’s leadership panel where women leaders from the Navy, Marines, and Coast Guard discussed milestones and accomplishments women have made across the services within recent decades. The panel held a conversation about gender equality and how the services are strengthened by women holding high-ranking positions.

“We talked about envisioning a future where women and men fit and what that might look like in each service,” said Navy Capt. Emily Bassett, president of the Sea Service Leadership Association. “We talked about simple things someone can do to make that happen such as mentoring young women. Specifically, what we wanted to get out was to come to the joint women’s leadership symposium where we’ll do what we did today but for a full two days.”

The 100 Years of Aircraft Carrier Operations panel brought together aircraft carrier commanding officers from USS Dwight D. Eisenhower (CVN 69), USS George Washington (CVN 73), USS John C. Stennis (CVN 74), and USS Gerald R.

Ford (CVN 78) to discuss the heritage and evolution of carriers as well as how their presence provides warfighters options with multi-mission capabilities and the future of carrier aviation.

“Each of the speakers talked about their Sailors,” said Capt. Paul Lanzilotta, commanding officer, USS Gerald R. Ford. “We talked about how important and resilient Sailors are. One speaker spoke about how the WWII generation won the war for the United States and how our current generation of Sailors are no different, if not better.”

Lanzilotta talked about the Sailors aboard his ship, saying he wants them to continue the emphasis on excellence. He said they can look forward to a little more technology in their lives, and his Sailors are much more knowledgeable about networks, computers and digital control of things happening on the flight deck. Even though technology continues to build, he has something he’s looking forward to in Sailors.

“My hope is the Sailors that we have working on all the gear that we have today come up with the next layers of ideas,” Lanzilotta said. “The ideas that take us to that next level. We have a lot of youth, a lot of expertise, [and] I’m eager to hear their ideas because I know that this old guy doesn’t have all the answers.”

During the Future of Naval Innovation panel, Rear Adm. Lorin Selby, chief of naval research, spoke about outsourcing to the private sector. The discussion addressed the need for new ways to introduce new capabilities to warfighters in both real and virtual experiments. The speakers addressed approaches to bring industry, academia and government to the table to focus on solving both Sailor and Marine problems with speed and at scale.

Selby asked the questions and then provided his advice on the matters. Questions like how do we go faster? How do we move technology faster from an idea, from a company into the hands of the Sailor?

“It’s less about the thing and more about the process of moving the technology faster,” Selby said. “How do we do that? Contracting, different approaches to experimentation, and ways to bring the warfighters in earlier to play with the technology. We can look into, maybe, making the technology less hardware-centric and make it more software-centric and more about the data that you get from the device.”

During the discussion, Selby continued to focus on reimagining naval power. He said Sailors in the fleet are eager to adopt

the technology they’re seeing in their personal lives, as part of the future of the Navy.

“Whatever device that you have, you have apps that you can get whenever you want; and when you’ve got that app, it gets updated routinely while you sleep. They want to have that kind of ability, to have that type of device in the fleet,” Selby said. “I think they are hungry to adopt technology that’s already adopted in the commercial sector. So, for that technology, we have to learn how to be fast followers of the industry. Instead of thinking we have

to invent it ourselves, we need to adopt what they’ve already developed and start using it. That’s a different mindset.”

On day three, one of the major highlights of the expo was the Navy Shipyards of the Future panel. The panel discussed how the Navy is looking to modernize its public shipyards and update critical manufacturing infrastructure. The day concluded with the Sea-Air-Space luncheon with retired Adm. John Richardson and retired Adm. James Stavridis discussing international security issues and the impact of climate on national security.

Highlighting Emerging Technology at Sea-Air-Space

Among the many speakers representing Naval Air Systems Command (NAVAIR) at the 2022 Sea-Air-Space Exposition, two focused on emerging technologies that began development and advancement outside of the DOD, but have since become areas where collaboration between the Navy and industry have proved mutually beneficial.

NAVAIR hosted a series of speakers during the three-day event in April, highlighting the many programs they employ to support its mission: to deliver integrated air warfare capabilities to enable the fleet to compete, deter and win—tonight, tomorrow and in the future.

Jerry Swift, Director of the Naval Air Warfare Center Aircraft Division’s (NAWCAD) AIRWorks program, gave an overview of NAWCAD and how it advances capability and operational readiness for Naval Aviation and delved into AIRWorks’ programs which are designed to deliver immediate and emerging warfighter capability needs.

Swift described how the Warfare Centers work together overall before changing focus to detail how they form an ecosystem for developing a warfighter, technology or capability from concept to program of record.

“If I’m a program manager with NAVAIR, my main area of responsibility is to make sure that the weapon system I am fielding is the most effective that it can be, but I need help doing so and need to look and see what other capabilities are out there and how they work with other platforms to complete the mission,” Swift said. “At the same time, the program office has to look five to 10 years down the line to look at possible new capabilities. The Warfare Centers do just that in helping bring more capabilities to the platform.”

Swift said NAWCAD seeks out the best candidates in the science and technology areas of industry and bring them in for collaboration through product centers such as AIRWorks, which

Theodore Gronda, head of the NAVAIR Additive Manufacturing Team, explains how the ability to use 3D printing for replacement parts is increasing fleet readiness.



U.S. Navy photo by Lisa Gleason

The Sea-Air-Space Expo is the largest maritime exposition in the U.S., and it was a good opportunity for first-time attendees to see the capabilities and camaraderie between our military branches.

“This is my first time coming to Sea-Air-Space,” said Cmdr. Rey Cabana, an operations research analyst attached to Naval Supply Systems Command. “I’m excited to see everything from all of the industrial partners we have worked with throughout the years so it’s good to see what they do for us in the Navy.”

From Defense Media Activity. 🐟

U.S. Navy photo by MC2 Nick Boris



Secretary of the Navy Carlos Del Toro speaks during the Secretary of the Navy Luncheon event at the 2022 Sea-Air-Space Exposition.

specializes in aircraft modifications and unmanned systems. AIRWorks helps bridge what Swift called “the Valley of Death” for a new technology.

“What we do with AIRWorks is bridge that ‘Valley of Death’ by helping the program office take the promising technology, apply it to their platform, bring that project over the threshold and help it become embedded as part of the overall program.”

Swift discussed a few examples of recent collaborative successes, including a rapid prototyping experimentation program conducted through AIRWorks: the Blue Water Maritime Logistics Unmanned Aerial System (UAS). Swift said in 2018, a need arose for increased capability to transfer small cargo loads from ship-to-ship or ship-to-shore and vice versa. After a long process of looking at what was available in the industry with existing vertical takeoff and landing UAS systems, the Blue Water UAS was selected and teams began testing it a short time later aboard USS Gerald R. Ford (CVN 78).

“Not only are we doing this in the unmanned air area, we’re also doing this in other critical technology areas,” Swift said. “We are doing a lot of engagement with industry.”

A presentation by Theodore Gronda, head of the NAVAIR Additive Manufacturing Team, explained how additive manufacturing increases readiness, sustainment of weapon systems and enhances warfighter capabilities.

Additive manufacturing is the ability to “print” replacement parts using 3D printers. The NAVAIR Additive Manufacturing Team coordinates with stakeholders and integrating teams to develop and print engineering products, as well as contracting and procurement management strategies that support 3D printing, hardware, acquisition and sustainment for equipment and services used to produce approved additive manufactured parts.

Gronda shared a story about a time several years ago where during an altercation in the Middle East, adversaries had

buried tanks in holes on a beach, making them difficult to target and hit. An unmanned aerial vehicle was deployed off a ship, flew over the tanks, radioed back coordinates and 16-inch guns from the ship were able to target the hidden tanks and take them out.

While performing this mission, Gronda said the UAV experienced some problems and he realized the issues were caused by faulty manufacturing. In order to fix the problems, he needed replacement parts, but due to his location, there was no way to quickly expedite the parts to the theater of battle.

“By the time the parts got there, the battle was over,” Gronda said. “If I had the ability to print the parts there, I could have done a lot more to help. The ability to print a part where we need it is incredibly important and increases our readiness. Now we don’t need to take an iron mountain of supplies with us when we go into the theater—we can just take the machine with us and print what we need.”

Gronda showed the audience several additive manufacturing examples used to increase readiness, items that could break from regular use and are not sourced as spare parts. By using additive manufacturing, the fleet is able to print plastic replacement parts from software—a technical data package—fed into the additive manufacturing machines anywhere in the world, and in doing so, save vast amounts of money and prevent aircraft from being grounded: by fixing a small part that is broken on one item, the entire unit does not need to be replaced, such as a lever on a pilot’s helmet or a radio frequency knob inside a cockpit.

He said additive manufacturing started out with printing plastic replacement parts, but the NAVAIR Additive Manufacturing Team has since moved on to print metal replacement parts, using much larger printers.

Compiled by Rob Perry, writer/editor for Naval Aviation News. 🐟

3RD MAW DEMONSTRATES



By Maj. Mason Englehart, 3rd Marine Aircraft Wing

The Navy and Marine Corps demonstrated a key capability when they operated 20 F-35B Lightning II jets from America-class amphibious assault carrier USS Tripoli (LHA 7) March 30 through April 8, fully exercising the Marine Corps' "lightning carrier" concept for the first time in naval history on an amphibious assault ship.

Commandant of the Marine Corps Gen. David H. Berger spoke to the potential of the "lightning carrier" concept based on amphibious assault ships in his planning guidance. "Lightning" is derived from the predominance of F-35B Lightning II aircraft aboard. The demonstration featured 16 jets from Marine Aircraft Group (MAG) 13, 3rd Marine Aircraft Wing (MAW), with an additional four from Marine Operational Test and Evaluation Squadron

(VMX) 1, all operating from USS Tripoli at a high tempo. The Navy and Marine Corps team has incrementally developed the "lightning carrier" concept and continues to refine its tactics, techniques and procedures to support integrated naval operations.

"When this opportunity came up to put this many of our fifth-generation aircraft on board Tripoli in conjunction with operational testing, we were thrilled," said Marine Corps Col. Chad

Vaughn, MAG-13 commanding officer. "It has been an incredible opportunity to train to fight as a MAG from the sea, to train our pilots, and to work alongside our Navy teammates."

The demonstration proved that an assault carrier can be a lethal addition and provides combatant commanders with more options when employed in creative ways. An earlier concept utilized amphibious assault ships to demonstrate the "Harrier carrier" concept for AV-8B Harriers.

This concept will not change the standard make-up of an Amphibious Ready Group and Marine Expeditionary Unit. However, the exercise demonstrated the potential to utilize amphibious assault ships to provide the naval and joint force

LIGHTNING CARRIER CONCEPT



Amphibious assault ship USS Tripoli (LHA 7), departs Naval Air Station North Island, Calif., April 7 with 20 F-35B Lightning II jets.

U.S. Marine Corps photo by Sgt. Samuel Ruiz

with lethal access, collection and strike capabilities from fifth generation Short Takeoff/Vertical Landing aircraft in future operations.

"This demonstration proved the versatility of the America-class assault carrier, with its ability to embark either two squadrons of F-35Bs and a MAG command element, or a battalion-sized landing force and the associated assault support [12 MV-22B Ospreys, four CH-53E Super Stallions and six F-35B Lightning IIs]," said U.S. Navy Capt. Joel Lang, Tripoli's Commanding Officer. "For the fleet commander, both options are formidable and sustainable."

Tripoli, an amphibious assault ship, is the second America-class landing helicopter assault (LHA) ship. Opti-

mized to support rotary- and fixed-wing operations, Tripoli carries two times as much aviation fuel, 30 percent more aviation ordnance, and—with an expanded hangar bay—more space to perform aircraft maintenance than its Wasp-class predecessors.

"The fifth-generation capability of the F-35B brings a significant advancement in capability to the combatant commanders, not only as a lethal strike aircraft but with the vast array of sensors that come with the F-35B's avionics suite," said U.S. Marine Lt. Col. Alexander Goodno, commanding officer of Marine Fighter Attack Squadron (VMFA) 225. "Having two full F-35B squadrons on a ship like USS Tripoli capitalizes on this next generation capability, provid-

ing the commander with a multitude of options."

As one of the Marine Corps' newest F-35 squadrons, the demonstration provided an opportunity for VMFA-225 to operate at sea for the first time as a squadron.

"The pilots and Marines of my squadron were really eager to gain experience operating at sea, test out this new capability, and work alongside an experienced squadron like VMFA-211 and the USS TRIPOLI crew," added Goodno. "I am exceptionally proud of how well the Marines of VMFA-225 performed in our first at-sea period. It was an exciting concept and one that we all believe should gain further consideration as an option for our forces moving forward." 🦅

USS Carl Vinson Celebrates 40th Commissioning Anniversary

By USS Carl Vinson Public Affairs

Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) celebrated its 40th commissioning anniversary March 13, a milestone in the ship's long history of service.

The third of 10 Nimitz-class aircraft carriers active in the fleet, Vinson commissioned in Newport News, Virginia, on March 13, 1982, after over seven years of construction. The ship is named for the late senator Carl Vinson of Georgia, who served in Congress for more than 50 years and sponsored two bills that played a significant role in the build-up of the Navy prior to World War II. For these accomplishments, Carl Vinson is now known as the "Father of the Two-Ocean Navy."

Since commissioning, Vinson has deployed many times overseas in support of American operations abroad, including Operation Southern Watch, Operation Enduring Freedom and Operation Iraqi Freedom. Most notably, the ship was underway during the Sept. 11th terrorist attacks and later launched the first airstrikes in the Global War on Terrorism. Four

years later, Vinson became the third Nimitz-class carrier to undergo a mid-life Refueling and Complex Overhaul (RCOH), which took place from 2005-2009. In January 2010, Vinson provided humanitarian aid after the devastating 2010 earthquake in Haiti. Most recently, the ship returned from an Indo-Pacific deployment in February. The

successful completion of deployment marked the debut of the "Air Wing of the Future," including the first incorporating of the F-35C Lightning II and the CMV-22B Osprey in a carrier strike group. For all of the above and more, Vinson has earned 15 unit commendations during its distinguished career.

While looking forward to many more years in service, Vinson honored its storied past by hosting nine members of the ship's original crew for a tour on March 13 followed by a cake-cutting ceremony in the ship's wardroom.

Otherwise known as "plank owners," the former crew members visited key areas of the ship, to include the flight deck, navigation bridge, hangar bay, captain's in-port cabin, fo'c'sle and wardroom. They were joined by the ship's commanding officer, Capt. P. Scott Miller, who cut the anniversary cake with Kurt Webber, of Peoria, Arizona, the oldest plank owner in attendance.

"This ship has a deep history of service over the last 40 years. The accomplishments of multiple generations of Sailors has truly earned USS Carl Vinson the title of 'America's Favorite Carrier,'" Miller said. "It is fitting that some of the first Sailors to serve aboard Vinson are represented here today, standing next to Sailors who have furthered Vinson's legacy of service with a recent deployment to the Indo-Pacific. We are proud to see the ship turn 40 as we continue to train and maintain readiness in the coming years."

A plank owner is Navy jargon for an original member of the crew who was present for the ship's commissioning. The nine plank owners in attendance represented thousands of the original crew that served on "America's Favorite Carrier" in 1982. 🌟

Aircraft carrier USS Carl Vinson (CVN 70) transits the Pacific Ocean, Feb. 13.

USS Carl Vinson Carrier Strike Group Returns from Deployment

Marks First Deployment of CMV-22, F-35C

By U.S. Third Fleet Public Affairs.



U.S. Navy photo by MC2 Tyler Wheaton

Sailors assigned to the Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) and Carrier Air Wing (CVW) 2 conduct flight operations on the ship's flight deck, Jan. 17.

The Carl Vinson Carrier Strike Group (CSG) returned to San Diego, California, Feb. 14, marking the end of an eight-month deployment to U.S. Third and Seventh Fleet's areas of operation.

After an accelerated departure from San Diego, the CSG supported integrated operations in the Hawaiian Islands operating area with the U.S. Marine Corps, Air Force and Coast Guard as part of the Defense Department's ongoing presence in the Indo-Pacific region. They continued into the Western Pacific demonstrating U.S. commitment to partnerships and alliances in the region while upholding a free and open Indo-Pacific.

"The tireless dedication and professionalism of

our Sailors through a global pandemic, challenging operational tempo and sacrificed time away from family, is truly humbling," said Capt. P. Scott Miller, commanding officer of Nimitz-class aircraft carrier USS Carl Vinson (CVN 70), the strike group's flagship. "Their efforts have demonstrated flexibility and resiliency and ensured mission success in every task. They have directly supported a free and open Indo-Pacific and have underscored our Navy's readiness, strength and lethality."

The Vinson CSG sailed more than 80,000 nauti-

U.S. Navy photo by MC3 Justin McTaggart



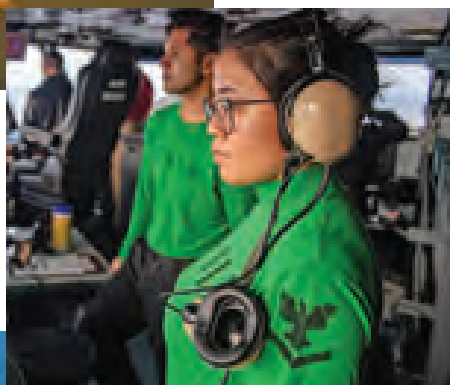
An F/A-18E Super Hornet, assigned to the "Stingers" of Strike Fighter Squadron (VFA) 113, launches off the flight deck aircraft carrier USS Carl Vinson (CVN 70), Jan. 15.



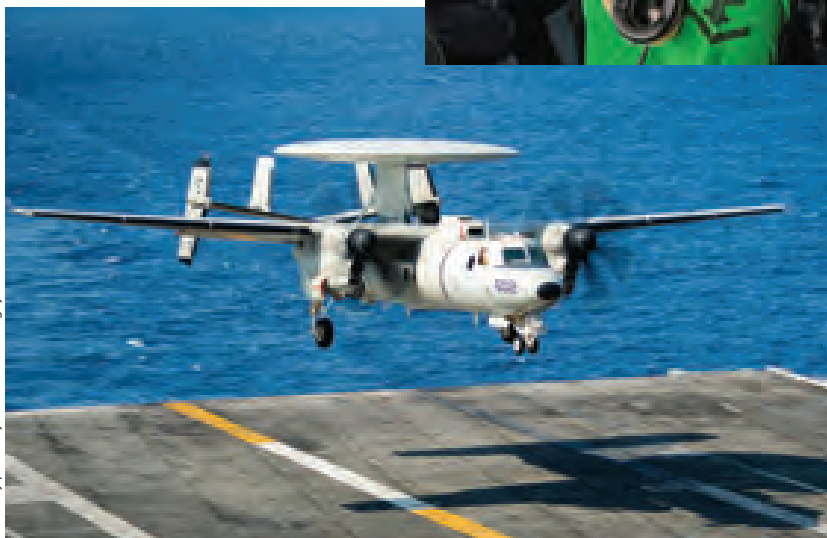
Aviation Ordnancemen transport AIM-9X Sidewinder missiles in the hangar bay, Jan. 28.

U.S. Navy photo by MCSN Isaiah B. Goessl

Electrician's Mate 3rd Class Chengjie Yang observes flight deck operations from primary flight control.



U.S. Navy photo by MCSN Sophia Simons



An E-2D Advanced Hawkeye, assigned to the "Black Eagles" Carrier Airborne Early Warning Squadron (VAW) 113, prepares to recover on CVN-70's flight deck.

"CVN-70 is the first aircraft carrier to deploy with a combination of fourth-and fifth-generation platforms within Carrier Air Wing (CVW) 2 that predominantly represent the 'Air Wing of the Future'"

cal miles while underway for 262 days, conducted dual carrier operations and multinational exercises, including maritime security operations; integrated training between surface and air units; long-range maritime strike; anti-submarine warfare; information warfare operations; maritime interdiction operations; personnel recovery; air defense operations; multiple ship navigation and formation maneuvering; and refueling-at-sea operations. While deployed, the strike group operated in some of the most heavily navigated waters of the Indo-Pacific including the South China Sea and the Philippine Sea.

CVN-70 is the first aircraft carrier to deploy with a combination of fourth-and fifth-generation platforms within Carrier Air Wing (CVW) 2 that predominantly represent the "Air Wing of the Future," including the F-35C Lightning IIs of Strike Fighter Squadron (VFA) 147, CMV-22B Ospreys of Fleet Logistics Multi-Mission Squadron 30, F/A-18E/F Super Hornets of VFAs 2, 113 and 192, EA-18G Growlers of Electronic Attack Squadron 136, the E-2D Advanced Hawkeyes of Airborne Command & Control Squadron 113, the MH-60R Seahawks of Helicopter Maritime Strike Squadron (HSM) 78, and the MH-60S Seahawks of Helicopter Sea Combat Squadron 4. The complete "Air Wing of the Future" will also include the MQ-25 Stingray, an aerial refueling drone, which is planned to be incorporated into carrier air wings in 2025.

During the deployment, the air wing executed more than 15,000 fixed-wing and helicopter flight hours comprising of 7,791 sorties, 7,702 launches and 7,761 aircraft arrestments.

The strike group successfully completed operations and exercises alongside multiple partners and allies including navies from Australia, Canada, Germany, India, the Netherlands, New Zealand and the United Kingdom, as well as the Japan Maritime Self-Defense Force.

Navy's V-22 Achieves Initial Operational Capability Designation

The Navy announced Feb. 18 initial operational capability (IOC) for the CMV-22B Osprey, confirming the platform's operational readiness following the successful completion of its maiden deployment.

The aircraft was formally declared IOC on Dec. 14, 2021, aligning with the scheduled first-quarter fiscal year requirement.

"CMV-22's maiden deployment with Carrier Air Wing (CVW) 2 and the [USS Carl] Vinson (CVN 70) team is an operational success, giving me the confidence necessary to make the declaration," said Rear Adm. Andrew Loiselle, Director, Air Warfare Division, N98, Office of the Chief of Naval Operations. "As we continue to deliver the advanced platforms that will comprise the 'Air Wing of the Future,' CMV-22B provides the necessary support and more to carry our future force."

Loiselle's designation marks a key milestone in the design, development, acquisition and testing of the CMV-22B and confirms its relevance and readiness to meet the needs of the Navy's Carrier Onboard Delivery mission. The aircraft transports personnel, mail, supplies and cargo from shore bases to aircraft carriers at sea, and will eventually replace the C-2A Greyhound. "IOC designation is more than a stamp of approval," said U.S. Marine Corps Col. Brian Taylor, V-22 Joint Program Manager. "It is a vote of confidence from top Navy leadership that the design, testing and production of this aircraft meet the logistical needs of the carrier air wings designated to fly the CMV-22B."

This past summer marked the first deployment for CMV-22B. Fleet Logistics Multi-Mission Squadron (VRM) 30 embarked on USS Carl Vinson (CVN 70) alongside the F-35C Lightning II and E-2D Advanced Hawkeye squadrons. The first deployed detachment has executed a 98 percent mission completion rate and a 75 percent mission capable rate. The CMV-22B is a crucial element of future carrier air wings due to the cargo capacity needed to transport F-35 power modules and additional logistics sup-



U.S. Navy photo by MCSN Leon Vonguyen



U.S. Navy photo by MC3 Megan Alexander

A CMV-22B Osprey, assigned to the "Titans" of Fleet Logistics Multi-Mission Squadron (VRM) 30, prepares for landing on the flight deck of the aircraft carrier USS Carl Vinson (CVN 70) Jan. 21.

Senior military leadership cross the flight deck to board a CMV-22 Feb. 9.

port for future carrier air wing deployments with next-generation platforms.

"This aircraft went from first flight to first deployment in 19 months—a feat possible through the dedication of the Navy's acquisition, engineering, test and operational communities and industry, all working in tandem toward a common goal," Taylor said.

With 50 percent more internal fuel than the Marine Corps' Osprey variant, CMV-22B can transport up to 6,000 pounds of cargo and personnel over a 1,150 nautical mile range. The Navy redesigned the forward sponson fuel tanks and added two wing fuel tanks to increase capacity and extend the flight range.

"As our fighter/attack and surveillance

aircraft expand in both capability and size to extend the range of the carrier air wing, we must also evolve our support aircraft, in tandem, to supply those platforms. The CMV-22B will transport cargo and personnel to outfit the most advanced aircraft carrier strike groups as we continue to meet the needs of our missions worldwide," Taylor said.

The program will continue to refine and test capabilities on the aircraft, addressing the agile needs of the fleet. To date, Bell Boeing has delivered 14 aircraft with 44 on contract and full operational capability expected in 2023.

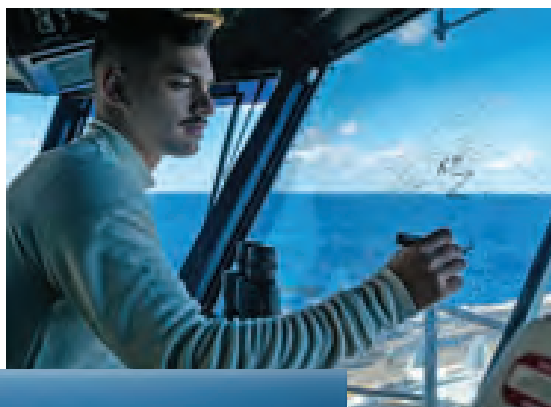
From the V-22 Joint Program Office Public Affairs. 🦅



An MH-60S Seahawk, assigned to the “Black Knights” of Helicopter Maritime Strike Squadron (HSC) 4, lifts off the flight deck Jan. 23.

U.S. Navy photo by MC3 Isalah M. Williams

Aviation Boatswain’s Mate (Fuel) Airman Samuel Nerison tracks flight operations in primary flight.



U.S. Navy photo by MC3 Caden Richmond



An F/A-18E Super Hornet, assigned to the “Bounty Hunters” of Strike Fighter Squadron (VFA) 2, prepares to recover on the flight deck.

U.S. Navy photo by MCSN Leon Yunguyen



Aviation Machinist’s Mate Airman Recruit Taylor Corral performs maintenance on an MH-60R Seahawk.

U.S. Navy photo by MC3 Caden Richmond

Notable multinational, bilateral and U.S.-only exercises included Large Scale Exercise 2021 in August, Operation Malabar and Maritime Partnership Exercise 2021 in October, Annual Exercise 2021 in November, U.S. and Australia’s bilateral exercise in December and Expeditionary Strike Force and dual carrier operations in January 2022.

“Alongside our partners and allies, we have aggressively pursued every opportunity to elevate our combat readiness in a drive to continue upholding regional stability,” said Rear Adm. Dan Martin, commander, CSG-1. “We’ve been doing this for 75 years and I’m proud to say that our team has relentlessly paid tribute to this legacy with many long hours of sweat and determination that started well before we left San Diego.”

The strike group operated alongside several other strike and ready groups including: the Ronald Reagan CSG, led by Nimitz-class aircraft carrier USS Ronald Reagan (CVN 76); CSG-21, led by HMS Queen Elizabeth (R08); the Essex Amphibious Ready Group, led by Wasp-class amphibious assault ship USS Essex (LHD 2); Japan Maritime Self-Defense Force Escort Flotilla 2, led by Izumo-class helicopter carrier, JS Kaga (DDH-184); and, most recently, the Abraham Lincoln CSG, led by Nimitz-class aircraft carrier USS Abraham Lincoln (CVN 72).

The Carl Vinson CSG comprises the Carl Vinson, embarked staffs of CSG-1, CVW-2 and Destroyer Squadron (DESRON) 1; nine embarked air wing squadrons; guided-missile cruiser USS Lake Champlain (CG 57); and DESRON 1 guided-missile destroyers USS Chafee (DDG 90), USS O’Kane (DDG 77), USS Stockdale (DDG 106) and USS Michael Murphy (DDG 112).

CSG-1 provides a combat-ready force to protect and defend the collective maritime interests of the U.S. and its regional allies and partners. The Carl Vinson CSG comprises more than 7,000 Sailors capable of carrying out a wide variety of missions around the globe.

An integral part of U.S. Pacific Fleet, U.S. Third Fleet leads naval forces in the Indo-Pacific and provides the realistic, relevant training necessary to flawlessly execute our Navy’s role across the full spectrum of military operations—from combat operations to humanitarian assistance and disaster relief. U.S. Third Fleet works together with our allies and partners to advance freedom of navigation, the rule of law and other principles that underpin security for the Indo-Pacific region.

From U.S. Third Fleet Public Affairs. 🇺🇸

Navy's F-35C Brings Unparalleled Capabilities to USS Carl Vinson Carrier Strike Group

Strike Fighter Squadron (VFA) 147 completed Feb. 14 its first-ever operational deployment with the F-35C Lightning II aboard the Nimitz-class aircraft carrier, USS Carl Vinson (CVN 70).

In January 2018, VFA-147 transitioned from the F/A-18 to the F-35C, making them the first operational F-35C squadron in the U.S. Navy.

Fifth-generation F-35C and CMV-22B Osprey joined a combination of fourth-generation platforms within the Vinson Carrier Air Wing (CVW) 2 to bring unprecedented capabilities as the "Air Wing of the Future."

"We took...the CMV-22 and the F-35 on the most capable aircraft carrier that the Navy's ever put forward," said Capt. P. Scott Miller, Commanding Officer, USS Carl Vinson.

The F-35C was designed with the entire battlespace in mind, bringing transformational capability to the U.S. and its allies. Missions traditionally performed by specialized aircraft—including air-to-air combat, air-to-ground strikes, electronic attack, intelligence, surveillance and reconnaissance—can now be executed by a squadron of F-35s.

For the first time in Naval Aviation history,

radar-evading aircraft stealth capability was on the carrier deck, giving pilots unmatched power to avoid detection and operate in contested environments. The F-35C carrier variant sets new standards in weapon system integration, lethality, maintainability, combat radius and payload that bring true multi-mission power projection capability from the sea.

"The F-35 Charlie brought us a rugged, low-observable platform, with some advanced sensor suites that were able to integrate across a strike group," said Capt. Tommy Locke, Commander, CVW-2. "It increased our lethality and survivability for the Carrier Strike Group."

According to Locke, the F-35C was like any other fixed-wing aircraft on carriers, flying very similarly. Integrating the fighter with its own version of the Navy's Precision Landing Mode (PLM), combined with Joint Precision Approach and Landing System (JPALS) was a huge success story. PLM revolutionizes the Navy's ability to land on carriers and eliminates the planning previously required to safely do so in challenging environments.

"We used to sit in the Carrier Air Traffic

Control Center (CATCC) at night trying to figure out how to get people aboard, manage the fuel, to ensure we had enough gas to get guys multiple looks," Locke said. "I'm happy to say it was a pretty boring time in CATCC 99 percent of the time."

Carrying almost 20,000 pounds of internal fuel with a range of more than 1,200 nautical miles, the F-35C can fly with more than 5,000 pounds of internal weapons and an additional 13,000 pounds of external weapons. The aircraft also brings to the force the ability to collect, analyze and share data, a critical asset in the battlespace.

Integration of the fifth-generation aircraft and mutual support between the air wing and rest of the ship was central to the success of carrier operations.

"I think one of our biggest accomplishments was we proved we were able to sustain, maintain and operate these new aircraft aboard the most agile, survivable and lethal airfields in the world—nuclear powered aircraft carrier Carl Vinson," Locke said.

Compiled by Lisa Gleason, writer/editor, Naval Aviation News. 🦅



U.S. Navy photos by MCSN Leon Vonguyen

An F-35C Lightning II, assigned to the "Argonauts" of Strike Fighter Squadron (VFA) 147, recovers on the flight deck Dec. 30.



Sailors taxi an F-35C Lightning II, assigned to the "Argonauts" of Strike Fighter Squadron (VFA) 147, on the flight deck Jan. 22.

DISASTER RELIEF MISSION TO HAITI

Highlights Navy/Marine Corps Interoperability, V-22 Capabilities

When called on recently to provide life-saving humanitarian assistance, Naval Aviation Training Support Group (NATSG) personnel did not hesitate to displace from their duty station to join a Marine squadron not only to render aid, but also to augment necessary squadron maintenance, operations and supply departments.

At about 8:30 a.m. Eastern Standard Time Aug. 14, a 7.2 magnitude earthquake struck the Tiburon Peninsula in the Caribbean nation of Haiti, near Petit-Trou-de-Nippes, near Port-Au-Prince, the nation's capital. More than 2,200 people died and 12,200 were injured. The earthquake also left 650,000 men, women and children in need of food, water and shelter.

U.S. military capabilities are most critical in the early stages of a disaster relief operation, when fewer resources and disaster-response experts are available to help victims and impacted communities. As those disaster relief operations progress and more uniquely experienced experts arrive to assist with longer-term recovery and reconstruction, the need for U.S. military capabilities diminishes as more experienced relief personnel and organizations assume the roles previously performed by military troops and units.

In response to the call for aid by the Haitian government, the U.S. Agency for International Development (USAID) immediately began relief efforts; DOD assets were scrambled to rapidly provide aid due to the limited capacity of the host nation to do so. Among the military assets activated for Humanitarian Aid and Disaster Relief (HADR) were the "Fighting Griffins" of Marine Medium Tiltrotor Squadron (VMM) 266 augmented with a detachment of 14 U.S. Navy officers and Sailors from NATSG, based out of Marine Corps Air Station (MCAS) New River, North Carolina.

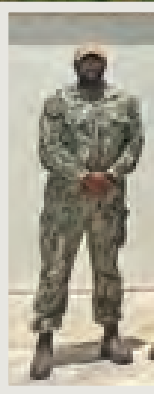
NATSG's mission is to provide support for U.S. Navy V-22 Osprey aircrew and maintenance professionals assigned for training and maturation at Marine Air Group (MAG) 26 and to prepare them for follow-on assignment and integration with Navy fleet Multi-Mission Wing squadrons.

"I got all the Sailors together and asked for volunteers, and the number of enthusiastic volunteers was overwhelming," said



U.S. Marines with Marine Medium Tiltrotor Squadron (VMM) 266, 2nd Marine Aircraft Wing, II Marine Expeditionary Force, deliver cases of food using an MV-22B Osprey in support of Joint Task Force-Haiti for a humanitarian assistance and disaster relief mission near Port-au-Prince, Haiti, Aug. 27, 2021.

A detachment of 14 U.S. Navy officers and Sailors from Naval Aviation Training Support Group gathered at Joint Task Force Guantanamo Bay, Cuba, to augment VMM-266 for a humanitarian assistance and disaster relief mission.



U.S. Marine Corps photo by Lance Cpl. Eric Ramirez

U.S. Marines with 2nd Marine Aircraft Wing, II Marine Expeditionary Force, prepare to board MV-22B Ospreys to deploy to Haiti in support of Joint Task Force-Haiti for a humanitarian-assistance and disaster-relief mission.

Cmdr. Keith Klosterman, Commanding Officer, NATSG. "It was extremely short notice and the fact that these Sailors could put their jobs and their lives on hold—not really knowing where they were going or how long they would be there—made me very proud of them."

The Navy and Marine Corps team responded immediately, deploying five MV-22 Ospreys to a forward operating base at Guantanamo Bay, Cuba, on Aug. 23, and immediately began their mission in Haiti's more grievously affected remote, mountainous areas. During the next two weeks, the NATSG Sailors and the "Fighting Griffins" dedicated themselves to daily humanitarian aid and disaster relief operations that showcased the prowess of the Osprey in its element.



U.S. Marine Corps photo by Lance Cpl. Caleb Stelter



U.S. Navy photo by AZI Mark Devereux



U.S. Marine Corps photo by Cpl. Yuritz Gomez

U.S. Marine Corps Sgt. Joseph Goff delivers cases of food in support of Joint Task Force-Haiti for a humanitarian assistance and disaster relief mission. Goff is an intelligence specialist and aerial observer assigned to VMM-266, 2nd Marine Aircraft Wing, II Marine Expeditionary Force.

“The NATSG Sailors are taught to both operate and maintain high readiness with the V-22 in a variety of conditions and while performing a variety of missions so there’s no specific HADR training, it’s just covered: We’re trained to operate this aircraft where it needs to go and whatever mission it needs to do,” Klosterman said. “When they went on deployment, there was no learning curve. Being the professionals they are, they were just ready to start operating.”

The Vertical Takeoff and Landing (VTOL) capability of the MV-22 meant it could make use of nearby naval warships as a fuel source and that the aircraft was not limited to runways or other prepared surfaces, allowing supplies to be delivered to more remote, unprepared landing zones when and where they

were needed. Additionally, the MV-22’s extended range and higher cruising speeds allowed it to complete a greater number of deliveries per day than the supporting helicopters, proving it to be the workhorse of the relief effort.

“Every airframe has its pros and cons,” Klosterman said. “What they did to a large degree of success with the V-22 was to try and get the best of both worlds when it comes to a fixed-wing and a rotary-wing aircraft. [The detachment was] able to operate out of Guantanamo Bay and that was due to the increased range and speed of the V-22. It doesn’t have the heaviest lift capacity in the fleet, but, compared with the speed and the range of a normal rotary-wing aircraft, the V-22 absolutely out-matches that, so they were able to base much farther away from the incident, but closer to the supply chain.”

“My involvement and that of my detachment in support of Joint Task Force-Haiti was incredibly rewarding,” said Lt. Andrew Sawyer, NATSG Detachment Officer in Charge. “It was personally gratifying in that we were given the opportunity to provide meaningful aid to the people of Haiti as well as professionally empowering in experiencing firsthand how different civilian and military elements were able to integrate so quickly, then apply the strengths of each component to the mission at hand. This operation showcased how fluid and flexible our forces can be in the wake of the unexpected and unknown. I am glad to have volunteered to take part in this disaster relief effort and I am very proud of the good done for the Haitian people.”

“The comradery between the Sailors and Marines was exceptional,” said Chief Aircrew Survival Equipmentman David Vadnais, NATSG Detachment Senior Enlisted Leader. “The Marine unit we were attached to welcomed us as if we had been a part of the unit from the beginning.”

“I couldn’t be more proud of the NATSG Sailors who volunteered for this arduous and short-notice mission,” Klosterman said. “Their participation epitomizes the strength and effectiveness of our Navy and Marine Corps team. It was extremely valuable for the pilot and aircrew who went there as part of the mission and were able to operate that mission, but also for our maintainers. One of the important things they need to have experience with is operating these aircraft with a small maintenance detachment. The way that this detachment was able to operate further highlights the capability and flexibility of the V-22.”

On Sept. 3, when military operations gave way to civil organizations within the country, VMM-266 and the Navy detachment had flown more than 5,300 nautical miles, transported 320 aid workers and delivered more than 234,100 pounds of life-giving food, water, shelter and medical supplies in order to meet the needs of the struggling Haitian population.

1st Lt. Gabriela Mogollan with the 2nd Marine Aircraft Wing contributed to this report.

Compiled by Rob Perry, writer/editor, Naval Aviation News. 🦅

ALL-WOMEN CREW RETIRE C-2A GREYHOUND IN CELEBRATION OF WOMEN'S HISTORY MONTH

By Petty Officer 2nd Class Olympia McCoy, Commander, Naval Air Forces

In celebration of Women's History Month, an all-women crew of pilots and support personnel assigned to the "Providers" of Fleet Logistics Support Squadron (VRC) 30 flew a C-2A Greyhound from Naval Air Station North Island, California, to Aerospace Maintenance and Regeneration Group (AMARG) on Davis-Monthan Air Force Base, Arizona, for the aircraft's retirement, March 23.

The C-2A Greyhound's primary mission as part of the carrier air wing is carrier onboard delivery (COD). The MV-22 Osprey has taken over this mission as part of the Advanced Air Wing and "Air Wing of the Future," which has led to the staggered retirement of Greyhounds in preparation for the sundowning of the VRC-30 squadron.

Cmdr. Jessica Caldwell, VRC-30's commanding officer, was one of the pilots for the flight and shared her sentiment regarding the C-2A platform and its retirement.

"This flight was our opportunity to honor Women's History Month by utilizing the female staff we have to put together an all-female crew to mark our place in the history of Naval Aviation."

"This aircraft was my workhorse as a junior officer," Caldwell said. "When I found out that it was being sent to AMARG, I knew I wanted to be a part of its last flight. The other pilot who I would be flying with suggested that we fly as an all-female flight crew in celebration of Women's History Month. We are fortunate to have enough qualified women here at VRC-30 and took it one step further to organize [an] all-female launch crew."

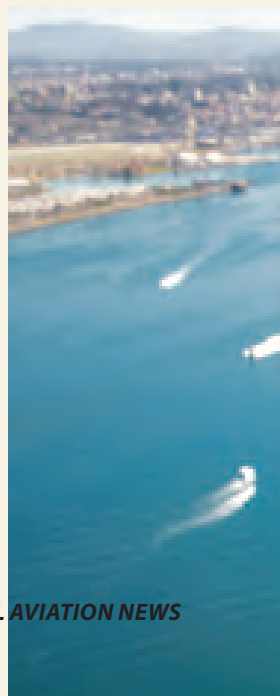
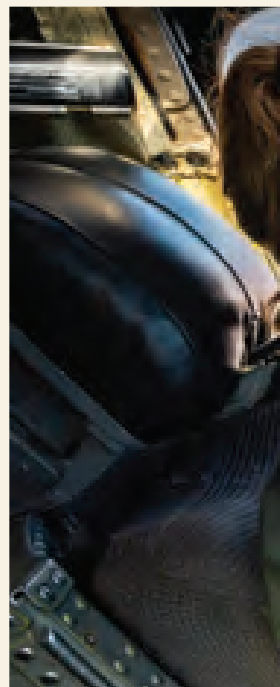
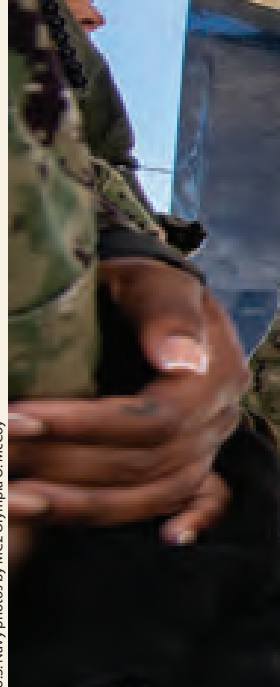
The U.S. Navy commissioned its first six female naval aviators in 1974. Today, 12 percent of naval aviators are female, and that number is growing.

"As I've progressed through my career, I've come to realize just how important it is to honor and highlight our diversity in the Navy," Caldwell said. "By celebrating Women's History Month, we are strengthening our forces. Understanding the significance and honoring the women that have come before us is what made this flight so important."

Lt. Cmdr. Jauren Jelinek, VRC-30's training officer, explained the flight paid homage to the history of a time-tested naval aircraft while looking towards a bright future of women in Naval Aviation.

"This flight was our opportunity to honor Women's History Month by utilizing the female staff we have to put together an all-female crew to mark our place in the history of Naval Aviation," Jelinek said. "This flight signifies that the portion of women in Naval Aviation is growing, and there are people out here that look like us. When you see someone that looks like you succeeding and doing this job, it makes you want to do this job." ✈️

U.S. Navy photos by MC2 Olympia O. McCoy





Chief Naval Air Crewman (Mechanical) Kami Mayer, assigned to the "Providers" of Fleet Logistics Support Squadron (VRC) 30, gives a pre-flight safety brief, March 23.



Cmdr. Jessica Caldwell, commanding officer of the "Providers" of Fleet Logistics Support Squadron (VRC) 30, pilots a C-2A Greyhound March 23.



Naval Air Crewman (Mechanical) 2nd Class Erin Cass, assigned to the "Providers" of Fleet Logistics Support Squadron (VRC) 30, observes San Diego from the cargo ramp of a C-2A Greyhound March 23.

How Naval Aviation is Solving Its



U.S. Navy photo by MCS Charles Blaine

Aviation Machinist's Mate Airman James Nickley inspects corrosion on the main rotor head of an MH-60S Seahawk helicopter in the hangar bay of USS Harry S. Truman (CVN 75).

By Paul Lagasse

Before joining the Naval Air Warfare Center Aircraft Division (NAWCAD), physical chemist Dr. El Sayed Arafat had never really thought much about corrosion. But over the next two decades, it became his specialty.

“I didn’t plan to work at NAWCAD,” said Arafat, who retired at the end of September. “I was a Professor of Chemistry at Rust College, in Holly Springs, Mississippi, when I received an invitation to visit and participate in one of the summer programs at NAVAIR. I am glad I came!”

Arafat joined NAWCAD’s Corrosion and Wear Branch, a component of the Air Systems Group—the organization primarily responsible for spearheading the Naval Aviation Enterprise (NAE) corrosion campaign. Right away, the branch head handed Arafat a big challenge. The NAE needed a way to prevent corrosion on aircraft components that had long shelf life and was easy to apply compared to existing products.

“Corrosion is almost like cancer,” Arafat said. “If nothing is done to stop it, it keeps on going until it is too late to fix it.”

Corrosion has long been a headache

for Naval Aviation. A recent audit by the Department of Defense (DOD) Inspector General reported that between 1989 and 2020, the Navy F/A-18C-G community issued no fewer than 14 technical directives augmenting corrosion mitigation practices across its squadrons. And it’s also a very expensive problem; the audit noted that from 2017 to 2020, corrosion maintenance conducted by squadron maintainers on F/A-18C-G aircraft cost the Navy more than \$2 billion. That does not include the costs it incurred treating corrosion in the Navy’s many other aircraft and ships in service.

With funding from the Office of Naval Research and the Defense Logistics Agency, Arafat and his team developed and tested NavGuard, a family of corrosion prevention compounds, as well as a suite of lubricants designed to prevent corrosion. Over the course of his NAWCAD career, Arafat has received many patents for the

products that he developed. The NavGuard corrosion prevention compounds, of which NavGuard IV is the latest, was developed to last longer than previous versions. Furthermore, one of the NavGuard products (NavGuard I) is explicitly designed to prevent corrosion and inhibit the growth of mildew simultaneously. Like corrosion, mildew is a constant headache for aircraft maintainers.

“Metal, oxygen and water are all that’s required to make rust,” Arafat said. “Preventing water from reaching the metal is the secret to mitigating it. In addition, if you can use a metal alloy that resists corrosion, that helps a lot too. And if you can combine the two, you get the best results.”

Corrosion has been singled out as Naval Aviation’s No. 1 systemic degrader—the top issue eroding overall performance of the Navy. Chemical corrosion prevention compounds like NavGuard enable maintainers to fight corrosion one aircraft at a time, but until recently, the Navy had yet to identify the best strategy to tackle the problem in a systematic manner.

To address these issues, NAWCAD, the Navy’s Fleet Readiness Centers, and NAVAIR’s Sustainment Group worked

Billion-dollar Corrosion Problem

together to establish a Corrosion Management Board in 2020 to guide strategy, address challenges, identify barriers, and track actions and outcomes across the Navy. Soon after its creation, the board identified and developed a process to baseline the corrosion health of each of the Navy's type/model/series aircraft, piloted as the Corrosion Health Assessment Scorecard—the first of its kind not only in the Navy, but throughout DOD. The scorecard identified several systemic challenges that contribute to corrosion, one of which was lack of training for corrosion maintenance tasking at the organization level.

To develop immediate solutions for the corrosion training gap, the Navy launched the Organization-Level Corrosion Control Reform program. The program is a Navy-wide training strategy designed to establish a cadre of proficient

and professional corrosion maintainers and improving material conditions throughout the fleet.

According to NAWCAD's Julia Russell and Cmdr. Terrance McCray, who are leading the corrosion response effort, the approach is threefold. First, the Navy needs to develop and implement a uniform training program for dealing with corrosion. Next, a cultural shift is required in how squadrons see corrosion mitigation. Historically, it has been considered a low-skill job that doesn't contribute much, if at all, to operational readiness. "We want to put in place a culture where squadrons see corrosion mitigation as being just as important as the radar system or the weapons delivery system, where they are motivated to try and outshine each other on corrosion mitigation the way they compete on readiness," McCray said.

Finally, sustaining corrosion training and culture change requires novel policy, said Russell and McCray. In order to track overarching NAE corrosion investment more effectively, they would also like to see corrosion mitigation established as a program of record within the Navy.

"It could take a decade or more to see the benefits of today's investment," Russell said. "There's no way to do this job without being optimistic."

That optimism is a characteristic of NAWCAD's approach to complex problems like corrosion mitigation. "It's a serious issue, and any effort that can reduce maintenance costs or reduce corrosion is very rewarding," Arafat said. "I'm very proud of the work that we've done at NAWCAD and that we continue to do."

Paul Lagasse is a public relations specialist with Naval Air Warfare Center Aircraft Division. 🦋



U.S. Navy photo by MCS Hunter Day

Aviation Support Equipment Technician Seaman Apprentice Zachary Owen uses an angle grinder to remove corrosion from a forklift in the hangar bay of the Nimitz-class aircraft carrier CVN-75.



U.S. Navy photo

Bret Sourbrine, right, F/A-18 Fleet Support Team East Coast Coordinator, works with a maintainer to apply NavGuard IV corrosion prevention compound to an F/A-18E Super Hornet at Naval Air Station Oceana in July 2018 as part of a field test of the compound's effectiveness.

A 'DAY IN THE LIFE'

of Marine Corps Heavy Lift Maintainers

By Victoria Falcón

Personnel with the H-53 Heavy Lift Helicopters Program Office recently visited Marine Heavy Helicopter Squadron (HMH) 464 at Marine Corps Air Station New River, North Carolina, to gain “day in the life” perspective of the squadron’s aircraft workload and facilitate communications between Marine personnel and the program office. The visit was hosted by HMH-464 and was successful in validating the important work being done by both organizations.

“The relationships we build in our day-to-day business will define our success,” said Joanna Sockoloskie, In-Service Co-Lead for the program office. “Part of our program philosophy states there is no such thing as ‘over-communication,’ so when the opportunity came for five of us to visit New River it was a no-brainer.”

Sockoloskie was joined by Garrett Douglass, procuring contracting officer; Chris Medic, class desk engineer for the In-Service team; and Toni Sieg, Fleet Common Operating Environment (FCOE) and readiness team analyst. Michelle Stone, lead of the H-53 Fleet Support Team, joined them from Fleet Readiness Center East, Cherry Point, North Carolina.

According to Sockoloskie, the group started their morning with a flight line standup meeting, observed a promotion ceremony, took part in a maintenance meeting, held some one-on-one meetings with squadron leadership and visited aircraft on the flight line.

“It was pretty much a ‘day in the life’ visit, as the fleet made no real accommodation for us—they just did their work and allowed us to observe and interact,” she said.

“During the meetings, we heard about the head-hurters for the Marines,” Sockoloskie said. “They discussed their priorities, parts issues, challenges they face and how they organize their days.”

According to Douglass, the program office team had a chance to talk about the current and future in-service products being designed and contracted for them.



CH-53 Super Stallions are staged on a flight line at Marine Corps Air Station New River, N.C.

U.S. Marine Corps photo by Lance Cpl. Anthony J. Brosilow

“We spoke about upcoming maintenance requirements such as RESET and our Contractor Maintenance Services efforts with Marine Heavy Helicopter Training Squadron (HMHT) 302,” Douglass said. “These contracts provide tangible benefits to them that they gave us feedback on in real time.”

The team was also given a run-down of the Aviation Maintenance Supply Readiness Report list of all non-flying aircraft and what’s preventing them from getting off that list.

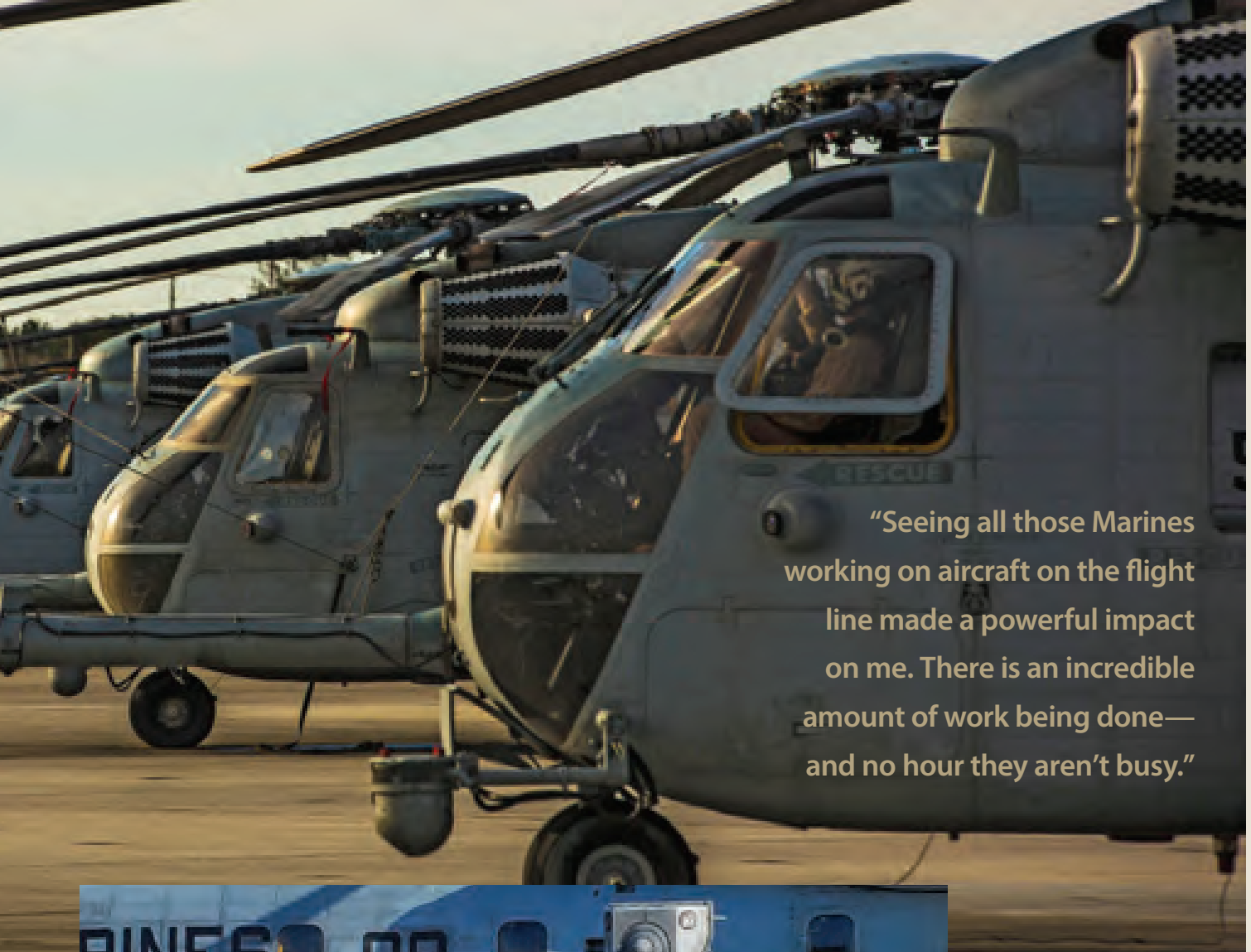
Sieg explained that the data she works with in her job provides only part of the picture.

“The information we gain from talking to the fleet, seeing firsthand what they see, gives us a much more complete answer,” she said.

That information sharing goes both ways.

“I hope the fleet gained some knowledge of what Naval Air Systems Command (NAVAIR) and the program office, specifically, do,” she said. “I explained to them how the data they provide is utilized outside of the fleet—not only by NAVAIR, but all the way up to the Pentagon, as well.”

“We shared trending data we have from other squadrons and how they are dealing with similar issues,” Sockoloskie said, “and we discussed some of the obsolescence and supply chal-



“Seeing all those Marines working on aircraft on the flight line made a powerful impact on me. There is an incredible amount of work being done—and no hour they aren’t busy.”



USMC photo by Capt. Molly Hurt

Members of the H-53 In-Service team, from left: Chris Medic, class desk engineer; Joanna Sockoloskie, team co-lead; Toni Sieg, Fleet Common Operating Environment (FCOE) and readiness team analyst; and Garrett Douglass, procuring contracting officer. Not pictured is Michelle Stone, H-53 Fleet Support Team (FST) lead.

lenges that we are tackling to prevent future impacts to mission capable rates.”

The team also discussed how they can assist with issues such as 182-day inspections and parts needs.

After hearing from the squadron in all these areas, Sockoloskie presented a brief on the NAVAIR organization, including how the focus of the program office may differ at times as it looks into the future to solve potential obsolescence and supply issues.

“I gained a renewed appreciation for the challenges that the fleet faces in their day-to-day operations,” said Sockoloskie. “See-

ing all those Marines working on aircraft on the flight line made a powerful impact on me. There is an incredible amount of work being done—and no hour they aren’t busy.”

Douglass had a similar reaction.

“We often speak about the 19-year-old maintenance line Lance Corporal out on the flight line,” he said, “but actually seeing them and speaking to them gave me valuable perspective behind the ‘why’ of what we do.”

Victoria Falcón is a Strategic Communications Specialist with the H-53 Heavy Lift Helicopters Program Office. 🇺🇸

Marines Complete First H-1 Mixed Fleet Link 16 Flight

By Joy Shrum



From left, Greg Coulter, DI Lead Engineer with the H-1 Light/Attack Helicopters Program Office, Matt Moritz, Avionics Lead Systems Engineer with the program office, Nick Embry, DI Flight Test Engineer with HX-21, and Victoria Couture, DI Flight Test Engineer with HX-21, successfully test L16 and ANW2 by disembarking from and continuing to communicate with a UH-1Y Venom and an AH-1Z Viper over an encrypted network, marking the first successful digital interoperability flight with an H-1 mixed fleet.

U.S. Navy photo by Elizabeth Mildenstein



Air Test and Evaluation Squadron (HX) 21 successfully demonstrated the first two-way connection between an AH-1Z Viper, a UH-1Y Venom and a portable ground station using the new Link 16 software at Naval Air Station Patuxent River, Maryland, in November 2021.

The new digital interoperability (DI) suite includes Link 16 (L16) and Advanced Networking Wideband Waveform (ANW2) data links and allows information to be shared across various networks.

“The H-1 has a proven track record on the battlefield and the Marine Corps is always looking to improve capability to ensure the aircraft is fully equipped with the latest technology to support Marines on the ground,” said Col. Vasilios Pappas, H-1 Light/Attack Helicopter Programs Office program manager. “The integration of L16 and ANW2 provides a much-needed capability to the fleet and will ensure H-1s have better situational awareness and enhanced survivability for decades to come.”

In November 2021, a mixed-section flight was conducted to represent an operational scenario involving close air support and casualty evacuation missions. This event consisted of inserting ground troops in an objective area and communicating over the ANW2 network.

“The ground troops were able to receive information from the aircraft on their tablets,” said Marine Corps Maj. Jason Grimes, the first flight pilot and H-1 project officer with HX-21. “This event validated the ability to insert troops in an objective area, immediately connect to their radio and provide constant communication.”

The ANW2 network provided fast and secure communication to all parties connected to this encrypted network. The mission-based test evaluation was able to prove the effectiveness of this mode of communication and demonstrated the added capability it gives the warfighter.

The DI test team will conduct its final software update evaluation in the spring prior to the operational test squadron’s evaluation of the entire DI suite. The Marine Corps will continue testing the DI suite throughout the summer and anticipates L16 fleet integration in early 2023.

The DI suite is part of a defined road map of planned improvements designed to ensure the H-1 platform maintains its technological edge and combat capability throughout its service life.

Joy Shrum is a communication specialist with the U.S. Marine Corps H-1 Light/Attack Helicopters program office. 🇺🇸



U.S. Navy photo by Joy Shrum

Marine Corps AH-1Z Viper and UH-1Y Venom stationed with Air Test and Evaluation Squadron (HX) 21 take off from Naval Air Station Patuxent River on the first successful mixed fleet Link 16 flight.

FRCE Achieves Safety Milestone in 2021

Fleet Readiness Center East (FRCE) closed out calendar year 2021 with the lowest number of Occupational Safety and Health Administration (OSHA) recordable mishaps in the depot's history.

OSHA defines recordable injuries or illnesses as those that result in days away from work, restricted work or transfer to another job; medical treatment beyond first aid; or loss of consciousness. A case also meets the recording criteria if it involves a significant injury or illness diagnosed by a physician or other licensed health care professional.

In 2021, FRCE recorded 36 mishaps, a 27 percent reduction compared to the previous year and a more than 60 percent decrease compared to mishaps recorded in 2016.

"Throughout the years, the Safety and Occupational Health division at FRC East continued to educate employees, develop policies and procedures and implement them," said Angelo Owens, the safety director at FRCE. "All of that, after a certain number of years,

comes together to have positive effects. I believe that's what we are experiencing here. Not only does the command support and promote certain policies and procedures in the way we perform work, we also have managers and supervisors who understand what their responsibilities are and employees who know what their responsibilities are."

Owens and Brian Snow, the assistant safety director at FRCE, both cite participation in the OSHA Voluntary Protection Program (VPP) as an important catalyst in forming the safety culture that exists at the depot. VPP recognizes employers and workers in the private industry and federal agencies who have implemented effective safety and health management systems and maintain injury and illness rates below national Bureau of Labor Statistics averages for their respective industries. To partici-

pate, employers must submit an application to OSHA and undergo a rigorous onsite evaluation by a team of safety and health professionals.

"We started on this road in 2006 with our involvement in VPP," Snow said. "Just getting the command into the mindset to do it actually got us on the right road to reducing injuries. The application process in itself is a huge undertaking. They came in to evaluate and we did it."

In 2019, FRCE achieved the OSHA VPP Star Status in two of the depot's application areas—smaller subsections of the expansive facility, each consisting of no more than 500 employees—becoming the first Naval Aviation command to reach that level.

"VPP Star is the highest recognition you can achieve with OSHA," Owens said. "When you say you are a VPP Star

Aquiles Faustino, a safety specialist at Fleet Readiness Center East (FRCE), speaks with Samuel Foreman, an electrical equipment repairer at FRCE, during a safety site survey. Site surveys like these play an important role in FRCE's safety program.



U.S. Navy photos by Joe Andes



site, it states that your safety and health programs exceed OSHA regulatory requirements in an exemplary manner. When you consider that there only 21 VPP Star recognized sites in the entire Department of the Navy, and that we are one of them, it's pretty exceptional."

According to Owens, collaboration and discussion play important roles in the VPP process.

"It's an all-hands effort and that's the way OSHA approaches it," Owens said. "We all need to be involved in the process. Communication is very important because it allows employees, supervisors, managers and leadership to talk about the issues we come across and how we can minimize the operational risk that we have here."

VPP participants are re-evaluated every three to five years to remain in the program.

"We'll be reevaluated in January of 2023," Owens said. "What that means is that representatives from OSHA out of Atlanta, Georgia, will come to our facility for a week. They'll bring with them a team of people who will be walking around and asking to see our programs, see our documentation of trainings and conduct periodic inspections. They'll be going out talking to our supervisors and employees to substantiate that what we are doing on paper is what we are actually doing within our facility."

FRCE's participation in VPP has not gone unnoticed. The Department of the Navy is now collaborating with the National Institute for Occupational Safety and Health on a study aimed at evaluating VPP's effectiveness in reducing noncombat injuries. This study will evaluate five VPP establishments by comparing VPP units to non-VPP control units matched on size and function. The Navy chose FRCE as one of the five VPP participants to take part in the study.

The command was also recognized by the North Carolina Department of Labor for its efforts to keep the workforce safe

by being presented two "Million Hour" awards and the depot's fourth consecutive "Gold Award."

To meet the Gold Award standard, an organization must have had no fatalities during the award year, and also post a days away, restricted or transferred rate at least 50 percent below the industry average. For FRCE, that means the aircraft maintenance industry. Million Hour safety awards are given to firms which accumulate 1 million employee hours with no injuries or illnesses involving days away from work. Subsequent awards are given for each additional 1 million employee hours with no injuries or illnesses.

FRCE also recently completed International Organization for Standardization (ISO) 45001 recertification. ISO 45001 is the world's international standard for occupational health and safety, issued to protect employees and visitors from work-related accidents and diseases.

"You can never let up," Snow said. "Often, you reach a goal and the tendency is to take your pack off, but we haven't been doing that. We just

continue to press forward. It's a continuing effort."

Owens agreed, adding that continuous effort is vital considering the scope of the depot's safety program.

"We've had a good year, but that was last year," Owens said. "We're trying to press the gas harder because I believe when you are performing well you need to work even harder to maintain that level of performance. There are more than 53 safety and occupational health programs we oversee in various capacities, ranging from radiation safety to fall protection. We are doing a good job, but I believe we can always do better."

While Owens and his team are proud of FRCE's safety record and achievements, he says the main focus is on protecting the depot's most important asset.

"As we continue to put aircraft out, we have to ensure we are doing it in a manner that protects our employees," he said. "We genuinely care about the FRC East family and we want to ensure the people who come here to work have a safe and healthy environment to work in." 🦅



Aquiles Faustino, a safety specialist at Fleet Readiness Center East (FRCE), conducts an inspection of a safe site board.

A V-22 Osprey recently flown from Okinawa, Japan, is temporarily parked on the flight line at Naval Air Facility Atsugi, Japan, while final induction coordination occurs between FRC WESTPAC, NIPPI Corporation, and the flight crew of Marine Medium Tiltrotor Squadron (VMM) 265.



U.S. Navy photo by FRC WESTPAC Public Affairs

FRC WESTPAC Inducts First Marine V-22 for Maintenance with New Contractor

Fleet Readiness Center Western Pacific (FRC WESTPAC) is inducting its first Marine Corps V-22 Osprey with Japanese industrial partner, NIPPI Corporation, for maintenance, repair and overhaul (MRO) services at their facility in Yamato, Japan.

The aircraft entering maintenance is an MV-22B Osprey belonging to Marine Medium Tiltrotor Squadron (VMM) 265, the "Dragons." Their mission is to provide assault support transport of combat troops, supplies and equipment in support of the Marine Air-Ground Task Force.

"FRC WESTPAC is very excited to be inducting this aircraft today, and adding another commercial partner to support V-22 planned maintenance interval (PMI) events in the region," said Lt. Col. Kevin Ryan, Commanding Officer, FRC WESTPAC.

"NIPPI Corporation has demonstrated their maintenance expertise on multiple other aircraft lines for FRC WESTPAC and we anticipate we will see the same quality output for the V-22 line."

NIPPI Corporation joins the new FRC WESTPAC V-22 maintenance contract, which Subaru Corporation had been supporting since 2015, to handle the maintenance requirement for the Osprey fleet located outside of the continental United States. FRC WESTPAC's customer base is mainly concentrated in the Asia-Pacific region, but can include any U.S. Navy or Marine Corps aircraft located around the world.

"With multiple contractors supporting the V-22 Osprey, FRC WESTPAC can guarantee that all future aircraft inductions will be the best overall value for the U.S. Government in terms of cost, aircraft turnaround time and quality of maintenance performed," Ryan said. "Our goal here at FRC WESTPAC is to rapidly repair and return safe, mission-ready aircraft

to the fleet so they have the warfighting capabilities to win, and at a cost conducive to the U.S. government."

As a new awardee on FRC WESTPAC's maintenance contract, NIPPI Corporation was allocated nine months to ready their facility and prepare their plan for maintenance of the aircraft. These requirements included, among other necessities, a facility with the necessary space and safety systems in place, an outline of manning capabilities with the appropriate technical expertise and a working supply chain or means of acquiring materials.

When asked about the upcoming induction, NIPPI leadership responded, "NIPPI is proud to be providing this capability for the U.S. Navy and Marine Corps, and we look forward to starting the scheduled maintenance event on this first V-22 aircraft."

NIPPI Corporation is a trusted, longtime partner of the United States government, servicing military aircraft since the early 1950s. To date, NIPPI Corporation has worked on more than 14,000 aircraft for the U.S. Navy and Marine Corps.

FRC WESTPAC currently has four aviation maintenance contracts with NIPPI for scheduled maintenance, repair, and overhaul services. These contracts include the H-1, H-60, F-18 and the newly awarded V-22.

"FRC WESTPAC's industrial partners are ready, willing and more than capable of producing the world-class quality aircraft that our customers need for future operations. With their support, FRC WESTPAC will continue to positively impact fleet readiness across the Naval Aviation Enterprise for years to come," Ryan said. 🇺🇸



FRCSW Inducts First CMV-22 to Suffer Mishap

Fleet Readiness Center Southwest (FRCSW) artisans and the Fleet Support Team (FST) recently joined industry partners and the V-22 Joint Program Office to prevent the loss of an CMV-22 Osprey aircraft which had suffered damage during a mishap.

The right-hand inner composite skin of the \$75 million aircraft sustained a 4-foot-by-2-foot crack with other, but minor, composite damage.

"A lot of people would have said, 'Hey, we need to strike this aircraft,' but the engineers at the FST and our industry partners decided to figure out a way to keep this asset in the fleet," said Col. Brian Taylor, program manager.

John Sandoval, sheet metal mechanic work lead, said that the repair required replacing the inner skin panel.

"We've removed over 1,200 fasteners separated by over 42 feet of composite inner skin to composite outer skin," he said. "This proved to be difficult because this is the first repair of its kind."

Compared to other airframes

served by the command, the V-22 is unique because of its aluminum, carbon/epoxy composite fuselage and empennage. Its wings and nacelles are also composite and fiberglass.

The aircraft, assigned to Fleet Logistics Multi-Mission Squadron (VRM) 30, was inducted by FRCSW on Jan. 13 as an in-service repair (ISR), or repairs outside of scheduled maintenance.

"This is the first major ISR and first mishap aircraft my team has performed on a CMV-22," said Michael Dixon, FRCSW V-22 production manager.

He said the labor-intensive repair would require about 70 days and more than 2,800 man hours to complete, with sheet metal work taking most of those hours.

In addition to four sheet metal

mechanics, other artisans needed to ensure a successful repair included electricians, mechanics, Quality Assurance and Planner and Estimator personnel. All will work in conjunction with engineering departments from the FST and Boeing.

"These capabilities are what really make Naval Air Systems Command (NAVAIR), the FST and the program office so incredibly important to this community because we have the ability to take care of our own stuff and keep these assets in the fight," Taylor said.

"The planning department estimated the repair will cost \$390,500. Currently, we are tracking to complete the repair on schedule and under budget," Dixon said.

The Osprey will be returned to VRM-30 when complete.

In the meantime, a safety investigation relating to the mishap is underway. ✈️



U.S. Navy photo

The VRM-30 CMV-22 Osprey inducted by FRCSW on Jan. 13 is pictured in Building 333. The inner composite skin of the aircraft suffered a 4-foot-by-2-foot crack during a mishap. FRCSW, FST, the V-22 program office and industry partners developed a repair plan to return the aircraft to its squadron.



U.S. Navy photos by Kimberly Koince

Rob Wansker (right), FRCE V-22 Power and Propulsion Auxiliary Power Unit (APU) senior engineer, and Derek Britton, mechanical engineer in the APU group, examine a clutch servo-valve filter for a V-22 APU. The APU group recently developed a process to clean and recertify these filters for use after supply issues made the critical part temporarily unavailable to the fleet.

Creative Engineering Solution at FRCE Overcomes Shortage of V-22 APU Filters

A supply shortage of clutch servo-valve filters for V-22 Osprey auxiliary power units (APU) threatened to keep a number of aircraft on the ground, until the APU group of the V-22 Fleet Support Team at Fleet Readiness Center East (FRCE) found a way to clean the disposable filters and reinstall them on the aircraft.

The APU filter is a consumable item that is replaced after 1,120 flight hours; it is ordinarily used for one cycle and disposed of after removal. With 375 aircraft in the Marine Corps fleet, the filter is a commonly used item, with a replacement rate of about 100 a month. The quarter-sized metallic filter is available from only one source and, due to supply-chain issues, the supplier couldn't keep up with demand. With no filters to be found in the supply system, APU engineering and logistics

personnel had to come up with a creative solution to fill the needs of the V-22 aircraft and the APUs undergoing overhaul at FRCE.

"We looked around for any retail or hidden assets that we might have stored away somewhere, but didn't find anything," said Joe Carson, V-22 Power and Propulsion logistics team lead at FRCE. "The filter was a consumable item, so typically the last option would be to ask engineering to reuse something that's a disposable item—but in this case, that was the last solution we had."

The filter is part of a critical oil line that helps engage the APU clutch to the mid-wing gearbox in order to start the V-22's main engines. Fleet maintainers are instructed to replace the filters when they are found to be clogged during inspection, but the supplier was not expecting deliveries until March 2022. That meant that several aircraft would not fly until filters could be found.

"Most engineers don't like reusing something that's consumable, because it's consumable for a reason," said Rob Wansker, FRCE V-22 Power and Propulsion APU senior engineer. "So we consider, what's the consequence of using this for a prolonged period of time? Can we push back the timeframe of replacement? We weighed our short- and long-term options, and we decided to see if we could clean and recertify the filters we had."

Engineering consulted with the Materials Engineering lab at FRCE to determine the best way to clean the small mesh filter.



After experimenting with a few scrap filters, FRCE chemist Megan Goold found a procedure that would allow the filters to be cleaned and reused if new filters were not available.

"I wanted to do the easiest cleaning possible, using materials the APU shop already had on hand that would be easily and readily available to the fleet as well," Goold said. "The easiest thing would be hand cleaning, so we tried different things in the lab until we found something that worked."

Isopropyl alcohol and a commonly used degreasing solvent did the trick, and engineering created a temporary instruction for depot and fleet maintainers to follow until the filters became more readily available through supply.

Another hurdle to solving this problem was that used filters were not readily available to clean. Disposable items like the filters are typically thrown away following maintenance procedures, which meant no stock of used filters existed. Wansker coordinated with depot and fleet mechanics working on V-22 APUs to encourage them to set aside the used filters in case they were needed for inspection and cleaning.

"We then took the filters that looked like good candidates, and cleaned and tested them according to the temporary procedure we had created," Wansker said. "Once we were able to get a batch of clean filters that engineering had approved, we were able to send those directly to the squadrons in order for them to be installed on an APU."

The engineering and logistics team had a temporary solution in place within a few weeks of identifying the supply problem. In that time, four aircraft had been grounded waiting for APU servo-valve filters, and the ability to clean and reissue the filters quickly returned those V-22 Ospreys to duty.

V-22 team members say the incident reminds them that even projects that seem routine can have profound impacts on the warfighters they serve.

"The V-22 Osprey is a massive aircraft, and to think that our team's assistance with this project was able to get these aircraft back in the air helps put the importance of what we do in perspective," Wansker said. ✈️



Rob Wansker, FRCE V-22 Power and Propulsion Auxiliary Power Unit (APU) senior engineer, indicates the location of the clutch servo-valve filter on a V-22 Osprey APU. Wansker's team developed a process to clean these filters after a supply backlog made the critical filters briefly unavailable to Navy and Marine Corps maintainers.



A close view of a clutch servo-valve filter on an auxiliary power unit for a V-22 Osprey. This quarter-sized filter is part of a critical oil line that helps engage the APU clutch to the midwing gearbox in order to start the V-22's main engines.

Professional Reading

By Cmdr. Peter Mersky, USNR (Ret.)



Chinese Air Power

By Yefim Gordon & Dmitriy Komissarov, Crécy Publications, Manchester, England. 2021. 400 pages. Ill.

This massive encyclopedia of the current fleet of Communist Chinese aircraft and the equally huge bureaucratic organization that houses them and their widely varying missions that threaten world peace has to be one of the most inclusive and perhaps intimidating aviation works to appear in several years. Although the threat of a new Russia following the demise of the Soviet Union is also rising amid the political ashes of the USSR, it is the new and increasing power of mainland China that now has the western world's focus, and with good reason. In truth, that threat has never left us.

I can't help remembering Gordon W. Prange's title to his classic study of the Japanese attack on Pearl Harbor, Dec. 7, 1941: *At Dawn We Slept*. This new voluminous book should start a few alarm clocks ringing. Actually, the bells have been ringing since Vietnam, but it is only now that we have begun hearing them. And like what the attack on Pearl Harbor signaled for us, I hope this new warning is not too late.

After a brief but informative history of military aviation in China, the book launches into a type-by-type, mission-by-mission discussion of every type of aircraft flown by the Chinese army, navy, police force, as well as unmanned vehicles. It is amazing just how many planes are used in this huge country. And, although there remain many types originally supplied by the Soviet Union, such as the MiG-21 Fishbed fighter and the Tu-16 twin-jet Badger bomber, there are quite a few original designs, a few of

China's first operational carrier, the CNS Lianoning under way with J-15 fighters on the flight deck. Note the up-sloped forward deck. The ship recently appeared along with its embarked air wing off Okinawa, causing the Japanese great concern.

which may look like American designs right down to their twin tails and their forward-placed canard control surfaces.

The fact that China has also been developing a somewhat viable, though at the time small aircraft carrier fleet, cannot be overlooked. At the time of publication, only one or two Chinese flattops are currently cruising Pacific waters with fighters and helicopters that, respectively, resemble Sukhoi and Kamov designs, indicating they are definitely gaining knowledge and expertise that go far beyond the abortive Soviet ships and aircraft of the 1970s. Again, we should take special heed of the great resemblance of the situation of the 1930s and ultimately the early 1940s when the Japanese learned from the British and Americans enough to field what became for a short and frightening time the world's premier fleet of carriers and used them to establish themselves in the Pacific. While the Mitsubishi Zero was not the direct copy of American fighters as was so widely



A J-15 seconds from touchdown on the Lianoning's flight deck. The J-15 in the background, No. 116 carries at least four PL-10 short-range air-to-air missiles, which entered production in 2013.



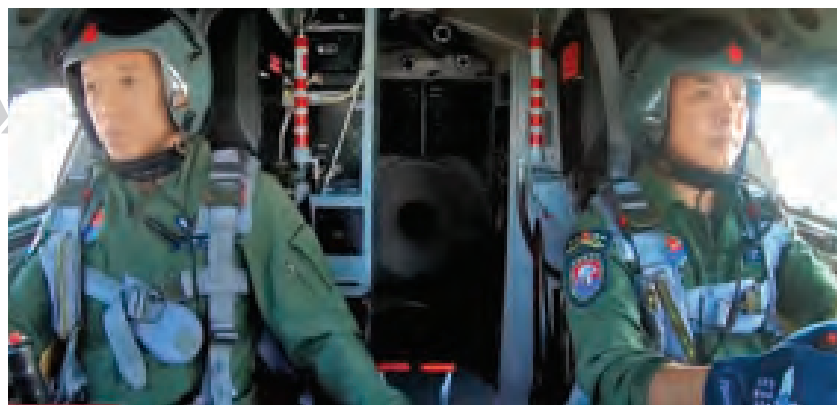
All photos courtesy of Yefim Gordon, Dmitriy Komissarov, and Crécy Publications.

claimed right before Pearl Harbor, its *Hiryu* and *Kaga* carrier partners definitely showed what their Japanese creators had learned by observing the U.S. and U.K. in the years following WWI.

The book contains a lot of information that should interest readers such as what was the type of aircraft that had a midair collision with a U.S. EP-3E Aires on April 1, 2001, which resulted in the pilot and his crew landing on a Chinese airfield and being interned for 11 days. It was a Shenyang J-8B, Finback in NATO code. The Chinese pilot was evidently lost. The incident was addressed in a two-part episode of the popular TV series "JAG." The second part has an overzealous U.S. Navy Hornet pilot taking the initiative to attack the Chinese airfield and destroy the EP-3E in hopes of rendering any information and devices the Chinese could glean from their prize useless. In the end, the young lieutenant is found guilty of disobeying orders and will be dismissed from the service. The Chinese pilot is



The Kilo model of the long-lived Badger is both a bomber as well as a missile-strike aircraft, and is powered by two non-afterburning turbofans.



The pilot and copilot of an H-6K Badger bomber of the 29th Air Regiment about to touch down. The captain is in the left seat and is in command as well as in control.



China is one of the very few nations that still uses water-borne aircraft. Here, an SH-5B bomber and ASW aircraft takes off. It uses four turboprop engines and retractable beaching gear, unlike older flying boats that used separate beaching gear to come ashore. However, the SH-5's gear is apparently not stressed to land on runways and, therefore, the aircraft is not a true amphibian.



Deck hands move in to tie down a Ka-28 ASW helicopter (NATO codename Helix) after it has landed aboard a replenishment ship, the CNS Qiandaohu. The Ka-28 has served Russian ships since 1982.

found to be alive and the Chinese submarine is uncovered to the embarrassment of the Chinese general involved.

The aircraft's designation was embarrassingly confused by a self-impressed young TV reporter who demanded to know why we were supplying a potential enemy with an obsolete U.S. Navy fighter, i.e., the Vought F-8 Crusader of Vietnam fame. He obviously had not done his homework to make this outrageous claim.

I would have liked to have seen at least one detailed map of China showing all the different provinces mentioned in

the book's text, showing where different facilities are, especially because Chinese navy ships are often named for those particular areas, such as their initial carrier, the CNS *Laioning* CV 16, a fairly impressive design that features a bow-placed ski jump, which seems to be *de rigueur* for all new carriers except for the U.S. designs, which are much larger.

Also, a glossary of Chinese acronyms, terms and places would have also helped a western reader to better understand the text and captions. While the index is large and detailed, it sadly lacks a usable listing that we often see in other books.

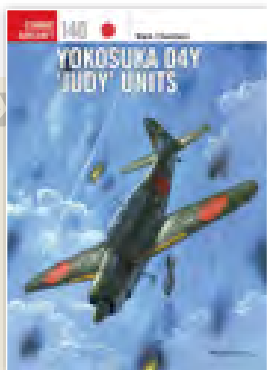
The fixed-wing fighters that fly from Chinese carriers show a definite similarity to Soviet Sukhoi designs. And although the Chinese use several Kamov helicopters, their indigenous helos are pretty much of home-grown design.

While sometimes relying on Russian support back in Putin's country, Chinese flight training is also understandably a major concern, resulting in a large number of their own jet trainers. Sometimes, the different trainer families are sub-divided to fit specific missions after performing their basic undergraduate training mission.

The Chinese also have a large fleet of cargo and transport types, some of which are still the still-useful Antonov series of multi-engine fixed-wing aircraft, including the An-12, similar to the Lockheed C-130 series. However, they also have a large number of their own designs.

All in all, the Chinese have definitely acquired their own surprisingly large and apparently formidable fleet of widely-varying aircraft that can probably be attributed to the country's vast geographic expanse and equally large population that results in a large number of service members.

Even allowing for possible errors, or overblown claims and performance numbers, this book should definitely tell us relatively safe in our own homes and bases here in America that China is an up-and-coming competitor and has the aircraft, ships and supportive equipment and personnel to prove it. 🇨🇳

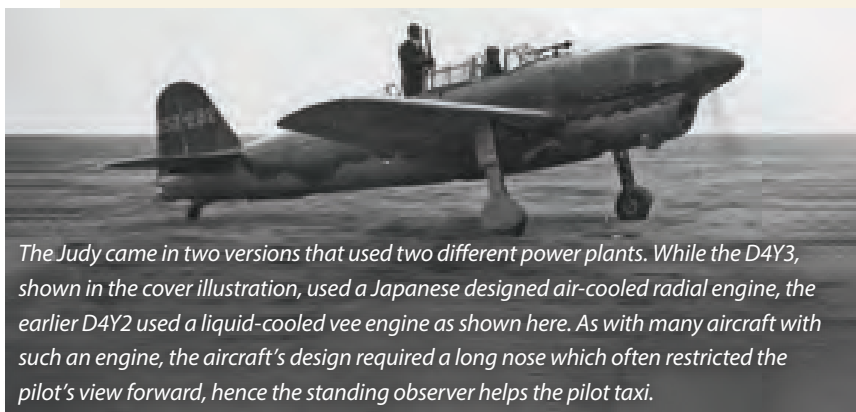


Yokosuka D4Y "Judy" Units

By Mark Chambers with Tony Holmes. Osprey Publishing, UK. 2021. 96 pages. Ill.

When it attacked Pearl Harbor on Dec. 7, 1941, Japan's navy was probably the most powerful and successful sea force in the world. Its ships, especially its aircraft carriers and their air wings carried what were at the time the best, and it wasn't until perhaps the Battle of the Coral Sea in early May 1942, and then the Battle of Midway a month later, that they suffered their first major defeat.

Yet, they were still a combined force to be reckoned with, even though new American designs such as the Grumman Hellcat and Vought Corsair, as well as the *Essex*-class of fleet carriers, were already beginning to enter service with both the U.S. Navy and Marine Corps, and Britain's Royal Navy and Fleet Air Arm.



The Judy came in two versions that used two different power plants. While the D4Y3, shown in the cover illustration, used a Japanese designed air-cooled radial engine, the earlier D4Y2 used a liquid-cooled vee engine as shown here. As with many aircraft with such an engine, the aircraft's design required a long nose which often restricted the pilot's view forward, hence the standing observer helps the pilot taxi.

Photo courtesy of Tony Holmes Collection

This familiar photo shows a D4Y3 on its suicide run against the carrier USS Essex (CV 9) on Nov. 25, 1944. The Judy and its two-man crew struck the carrier's flight deck causing an explosion and fire that killed 15 and wounded 44. Note the aircraft's round, open nose indicating it used a radial engine.



National Archives and Records Administration



Looking like any young aircrewmen, these members of the Specialist Reserve Students class in March 1945 pose in their flight gear beside their weathered D4Y3. Of these six men, four were killed in action off Okinawa.

Photo courtesy of Tony Holmes Collection

The iconic D3A dive bomber that was eventually codenamed "Val" by the Allies, was well-established in the Imperial Japanese Navy (IJN) and served in most if not all the theaters where Japanese carriers operated. But the Japanese were fast at work with the Val's successor, which first flew in December 1940, surprisingly with a German Daimler-Benz in-line engine, one of a few Japanese designs to be so powered. Most Japanese army and navy combat aircraft used radial engines.

Named the Suisei (Comet), the D4Y1's initial performance was as good as expected, but Japanese mechanics were not familiar with the German engine's design, which initially gave problems and was eventually replaced by a Japanese Aichi, then Mitsubishi engine, with the Suisei going through D4Y2 to D4Y4. The new dive bomber saw its first action as early as Midway in June 1942, with fleet-wide use going through most of the mid- to late-war engagements in which the rapidly dwindling IJN participated. This somewhat mysterious but well-used dive bomber's history and wartime career is well covered in this book, No. 140 in the Combat Aircraft series. It even saw service as a makeshift night fighter to combat the increasing number of large B-29 attacks that were soon devastating the Home Islands.

The photos and Osprey's dependable artist Jim Laurier's profiles are fine. Mark Postlethwaite's evidently final cover for Osprey (he is engaged in other pursuits) is one of the Combat Aircraft series' most dramatic and atmospheric illustrations.

Although Osprey's uniquely designed and well-illustrated soft-cover books are slowly increasing in price, they still offer great value for the money and coverage. No other publisher has developed such a line of distinct books that are rapidly covering every type of aircraft, conflict and history. This addition to the Combat Aircraft series is no exception. ✈

U.S. Naval Test Pilot School
educates the **WORLD'S FINEST**
aviators and engineers in the
design, risk management,
execution and communication
of aircraft and systems testing
for combat.

APPLY TODAY!
SEATS ARE LIMITED

REACHING

FLIGHT



UNITED STATES NAVAL TEST PILOT SCHOOL

USNTPS

USNTPS OFFERS CURRICULA IN:

- Fixed Wing
- Rotary Wing
- Airborne/Unmanned Systems (NFO)

HOW TO APPLY

SUBMIT YOUR APPLICATION:

Navy Personnel Command
<https://www.mynavyhr.navy.mil/Career-Management/Boards/Administrative/Test-Pilot/>

Mark these dates on your calendar

June Selection Board for January Class

- Applications accepted: Up to May 9, 2022
- Board convenes: Mid-June
- Results posted: July/August

Dates subject to change

For more information on
the U.S. Naval Test Pilot School visit:

<https://www.navair.navy.mil/nawcad/usntps>

I AM NAVAL AVIATION

Lt. Luke Theriault, Strike Fighter Squadron (VFA) 11



NAVAL AVIATION NEWS

NAVAIR Command Communications Dept. ■ 47123 Buse Road, Suite 547 ■ Patuxent River, MD 20670