NAVAL AVIATION NEWS

THE FLAGSHIP PUBLICATION OF NAVAL AVIATION SINCE 1917 WINTER 2020

E-2D

Launching into the Next Decade

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Four MV-22B Osprey's with 3rd Marine Aircraft Wing (MAW) are staged in preparation for the loading of Marines from 1st Marine Division during exercise Steel Knight aboard Marine Corps Air Station Camp Pendleton, Calif.

U.S. Marine Corps photo by Warrant Officer Justin M. Pack

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ON THE COVER

On the cover: *Air Test and Evaluation Squadron (VX) 20 conducts flight testing of an E-2D Advanced Hawkeye. (U.S. Navy photo by Liz Wolter)*

This issue highlights the updated capabilities of the E-2D Advanced Hawkeye starting on page 26. Vice Adm. Dean Peters, commander, Naval Air Systems Command, and Bill Taylor, assistant deputy commandant for aviation, share the ongoing benefits Naval Aviation is reaping under the Naval Sustainment System-Aviation initiative on page 4. The latest on deployed and Ford-class aircraft carriers is featured throughout the magazine with a summary of the recent USS Abraham Lincoln (CVN 72) deployment on page 8. Page 14 discusses aircraft compatibility testing aboard USS Gerald R. Ford (CVN 78) and page 16 covers advanced arresting gear operations. The christening of PCU John F. Kennedy (CVN 79) and the naming of USS Doris Miller (CVN 81) follow. Our coverage of Naval Test Wing Atlantic squadrons continues with an update on test projects conducted by Air Test and Evaluation Squadron (VX) 20 on page 35.

On the back cover: *Aviation Machinist's Mate 3rd Class Zachary Barr replaces a rotor on an MH-60R Seahawk helicopter with Helicopter Maritime Strike Squadron (HSM) 79 on the flight deck of aircraft carrier USS Abraham Lincoln (CVN 72). (U.S. Navy photo by MC3 Michael Singley)*

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

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Flightline

First-Hand Results of Naval Sustainment System-Aviation

By Vice Adm. Dean Peters and Bill Taylor

During the past year, Naval Aviation made meaningful strides toward improving readiness and sustainability across our strike fighter communities. Since October, in partnership with leadership across the Naval Aviation Enterprise (NAE) including Navy Air Boss Vice Adm. DeWolfe Miller, Deputy Commandant for Aviation (DCA) Lt. Gen. Steven Rudder and other military and governmental partners, we have had the opportunity to visit Fleet Readiness Centers (FRCs) and additional units at four locations vital to our Super Hornet platforms. Sites visited were Marine Corps Air Station (MCAS) Cherry Point, North Carolina, Naval Air Station (NAS) Jacksonville, Florida, NAS Lemoore and North Island in California.

These events are known as Boots on the Ground (BoGs) and are a common NAE activity. Two things set these visits apart: the close scheduling of the events—three visits were conducted in December—and the specific purpose of touching as many major FRCs as possible to understand if Naval Sustainment System-Aviation (NSS-A) reforms are sustainable. In addition to the depot-level maintenance we observed at the FRCs, we had the chance to visit several organizational-level activities, including the Naval Aviation Maintenance Center for Excellence (NAMCE) at NAS Lemoore.

U.S. Navy photo by Toiete Jackson

Artisans assigned to Fleet Readiness Center Southeast's paint strip team prepare a T-6 Texan II aircraft to be stripped and primed for induction into the production system.

During these visits, we observed firsthand the effect the NSS has had on maintenance, production and supply. We spoke directly to members of these and other teams who work on our aircraft every day to hear what improved their operations and where we can provide assistance.

Across the board, we saw substantial improvements in workspace layouts, turnaround times for maintenance, backorders of high-priority requisitions that are missing from the supply shelf and planning for the future. Daily meetings taking place in various Production Control Centers are identifying and elevating issues for resolution more quickly. Improved floor organization makes finding parts and pinpointing support required by the supply chain more efficient.

More importantly, we witnessed an improved culture on those lines and in those shops where NSS reforms had been accomplished. An important part of this culture is the intent to treat artisans as surgeons, providing all the parts and tools they need for their jobs at the site rather than having them spend time away from fixing aircraft as they search for their supplies.

We found that the aircraft production line at Fleet Readiness Center West (FRCW) at NAS Lemoore is sustaining reforms; Fleet Readiness Center Southwest (FRCSW) at NAS North Island is sustaining reforms in its component shops; and Fleet Readiness Center East (FRCE) at MCAS Cherry Point has continued to sustain reforms for critical component shops and expanded reforms to aircraft planned maintenance interval (PMI) lines.

Here are a few of the many specific examples of improvements we encountered:

- The T-6 repair line at FRCSE reduced cycle time from 187 days to approximately 100 days, on their way to a standard 77-day event.
- The H-53 program at FRCE reduced cycle time by 10 percent on CH production and 30 percent on MH production.

U.S. Navy photo

Fleet Readiness Center East H-53 Disassembly and Repair Shop keeps with the production pace in its new location.

U.S. Navy photo

Boeing F/A-18 Hornet aircraft under rework in the hangar at Fleet Readiness Center Southwest.

- The V-22 program at FRCSW has no outstanding supply issues—a goal for which every shop must strive.
- The Super Hornet PMI line at FRCW consistently delivers aircraft in 60 days or less.

This is phenomenal work being done, all of which is contributing to the NAE sustaining mission capable (MC) Super Hornet numbers above 325 (historically numbers hovered around 250-260). In addition, Legacy Hornets are returning to service in days versus weeks after PMI and maintaining percentages in the high 70s for MC aircraft.

MC aircraft make up the critical baseline that is our future readiness for the high-end fight. Without "up" aircraft, we cannot prepare to meet mission requirements; with them, we can build for whatever operations come our way. MC aircraft mitigate problems across the NAE, including projected pilot shortages. More MC aircraft mean more aircraft available for the training commands and fleet replacement squadrons. They also mean more flying hours for our trained pilots, so they can hone their skills.

Together, we're seeing remarkable change, but we still have much work to do.

We now must expand the improvements we've achieved to all shops,

repair lines and squadrons across Naval Aviation. In addition, we still have vital components that must be available in greater numbers and repaired in shorter amounts of time to increase lethality and survivability, per Air Boss and DCA priorities.

We will continue to attack readiness degraders through the Reliability Control Boards (RCBs), making better use of data to refine our maintenance programs and supply forecasting. Across all these efforts, we must integrate improved cost management.

It is powerful to see the close alignment between the Navy and Marine Corps as we advance these priorities. This is a true partnership—one team with one fight. And it is encouraging to receive the positive feedback from our artisans, maintainers and production support personnel who are super motivated to provide quality products, and are taking ownership of these reforms.

As always, your NAE flag officers, general officers and senior executive service leaders are committed to providing the resources needed to accomplish our mission. Don't hesitate to let us know what is needed. Fly, fight, lead and win!

Vice Adm. Dean Peters is Commander, Naval Air Systems Command (NAVAIR). Bill Taylor is Assistant Deputy Commandant for Aviation, U.S. Marine Corps, and a member of the Senior Executive Service.

A native of Louisville, Kentucky, **Vice Adm. Dean Peters** graduated from the U.S. Naval Academy in 1985. Peters earned post-graduate degrees in aeronautical engineering and telecommunications and is a graduate of the U.S. Naval Test Pilot School, Class 102.

After earning his wings as a Naval Aviator in 1986, he flew the SH-2F Seasprite in support of multiple detachments deployed to the North Atlantic, Persian Gulf and Gulf of Mexico, completing anti-submarine warfare, surface warfare and counter-narcotics operations embarked on four different ship classes. He served as detachment officer-in-charge aboard USS Thomas C. Hart (FF 1092).

As Commanding Officer of Air Test and Evaluation Squadron (HX) 21, the squadron accomplished more than 11,000 flight test hours and was the 2006 recipient of the CNO Safety Award.

Peters has served in numerous acquisition billets. From November 2007 through July 2011, he was program manager for the H-60 Helicopters Program Office, delivering more than 150 helicopters, numerous upgrades and supporting the first three carrier strike group deployments of the MH-60R and MH-60S Seahawks. From August 2011 to July 2014, Peters commanded the Presidential Helicopters Program Office, leading the program through Milestone B and contract award for the Engineering and Manufacturing Development Program.

Peters' flag assignments include Commander, Naval Air Warfare Center Aircraft Division and Assistant NAVAIR Commander for Research and Engineering; and Program Executive Officer, Air Anti-Submarine Warfare, Assault and Special Mission Programs (PEO(A)).

He has more than 3,800 flight hours in fixed and rotary wing aircraft.

Peters assumed responsibilities as Commander, Naval Air Systems Command in May 2018.

Since June 2016, **William E. Taylor** has served as the principal advisor to the Deputy Commandant for Aviation on all matters related to Marine Aviation readiness and sustainment, including oversight of Marine Aviation integration into the Naval Aviation Enterprise (NAE).

Taylor was appointed to the Senior Executive Service (SES) in December 2008. A veteran Marine helicopter pilot with nearly 5,000 flight hours, Taylor's operational experiences include combat operations in Beirut, Lebanon, missions in Cambodia in support of Joint Task Force Full Accounting and presidential support while a Marine One pilot assigned to Marine Helicopter Squadron (HMX) 1. While a program manager, he successfully led the CH-46 Sea Knight and V-22 Osprey programs prior to his selection as the Marine Corp's first Program Executive Officer for Land Systems (PEO LS) in January 2007.

Taylor retired from active duty in September 2008 with 29 years of service, and returned to the helm of PEO LS upon his appointment to the SES. A native of Edison, New Jersey, Taylor graduated with a bachelor of science degree from Rutgers University and later earned a master of science degree in defense systems acquisition management from the Naval Postgraduate School, Monterey, California.

Grampaw Pettibone

Gramps from Yesteryear: March-April 2000

Illustration by Ted Wilbur

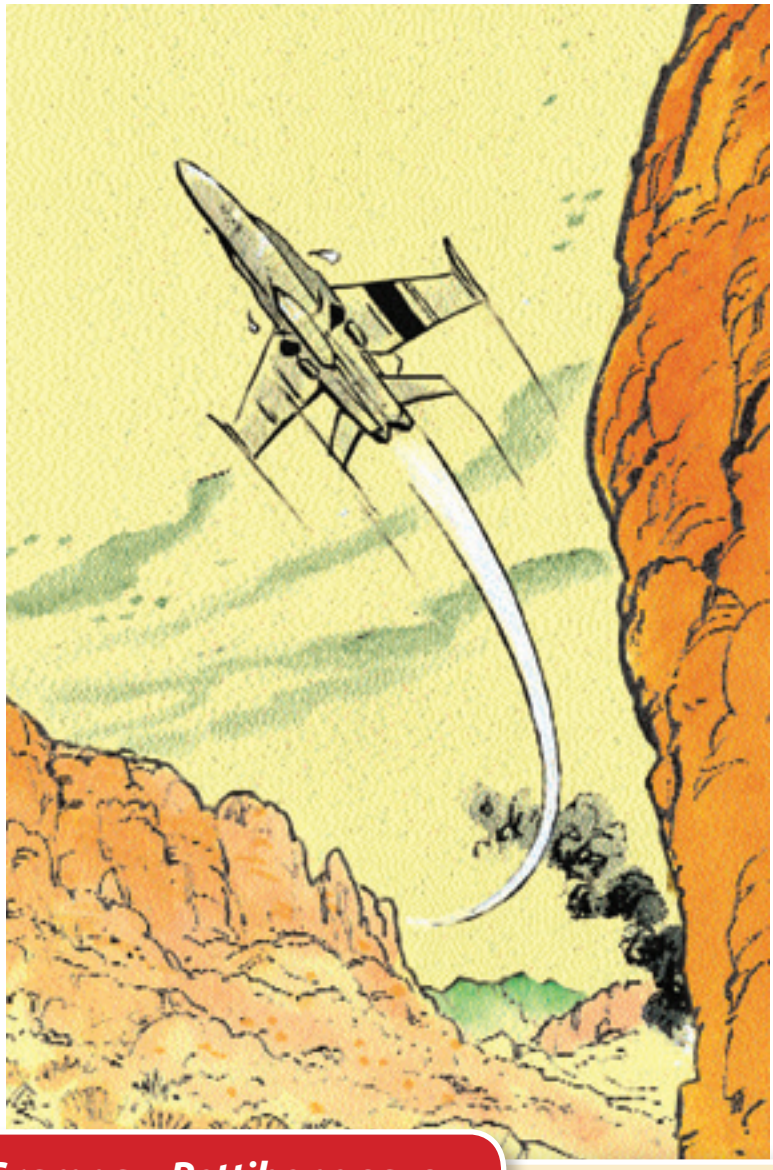
A Canyon Catastrophe

A flight of two F/A-18 Hornets was on a two-fold training mission: one part dissimilar air combat training (DACT) and the second, low-altitude training. The day before, the squadron executive officer had briefed the fliers on the hazards of low-level flights and covered flight through canyon areas, emphasizing the danger of such flights close to the ground.

One pilot was the lead, under training, while the wingman was the mission commander. The DACT portion of the mission was completed without incident. Subsequently, the lead pilot determined the flight did not have sufficient fuel to return to base as briefed, which meant curtailing the low-level route. To conserve fuel the leader flew along the initial portion of the low-level route at 5,000 feet and 250 knots. When the low-level route intersected the canyon portion of the flight, lead descended into the low-level environment.

The mission commander lost sight of the leader as the flight commenced the route. Approximately one minute later, the mission commander observed a bright flash ahead and low on the canyon's left wall. The flash then changed to what was perceived as a fireball followed by thick black smoke. The Hornet had crashed. The pilot was killed, the aircraft destroyed.

Investigators determined that the F/A-18 struck the canyon wall about 75 feet from the edge of a sloping ridge line in a high-G, high-angle-of attack, right banked turn. There was no evidence of engine or systems failure, nor any sign of an ejection attempt.



Grampaw Pettibone says …

Shouldn'ta happened, but it did, so learn from it. The lead pilot's Hornet was in a hard right-hand turn within the confines of the canyon walls, and he either didn't see the ridge line approaching or did not realize his flight path was below it. It's also possible that he became aware of the ridge line too late to avoid it.

Would it have helped if the flight had practiced low-level maneuvers over less hazardous terrain before descending into the canyon environment? Maybe. The investigators did conclude that the lead pilot had insufficient low-level flight experience for operating in a canyon area. Plus, he hadn't had enough rest before the mission. He was an extremely motivated aviator but considered by some to be overconfident. Not a good combination for pilots flying high-performance aircraft fast and close to Mother Earth.

Seniors in the chain of command, including the mission commander, could have exercised better judgment in handling the preparation for this flight.

Airscoop

Compiled by Andrea Watters and Rob Perry

Abraham Lincoln CSG Home after Around-the-World Deployment

U.S. Navy photo by MC2 Danielle A. Baker

Nimitz-class aircraft carrier USS Abraham Lincoln (CVN 72) transits San Diego Bay.

SAN DIEGO—The Abraham Lincoln Carrier Strike Group (CSG) arrived Jan. 20 at Naval Air Station (NAS) North Island, marking the end of a 10-month deployment to the U.S. 5th, 6th and 7th Fleet areas of operation (AO). This was the longest nuclear carrier deployment since the Vietnam War.

The strike group deployed April 1 from Norfolk, Virginia, in support of maritime stability and security.

With flagship USS Abraham Lincoln (CVN 72), embarked Carrier Air Wing (CVW) 7 and the staffs of CSG-12 and Destroyer Squadron (DESRON) 2, the strike group steamed east all the way around the world.

On Jan. 19, more than 100 naval aviators with CVW-7 returned to their home bases at NAS Oceana in Virginia Beach and Norfolk Naval Station.

CVW-7 commander (CAG), Capt. William Reed returned to Norfolk with Airborne Early Warning Squadron (VAW) 121, and reflected on his appreciation for the men and women assigned to CVW-7 during their record-breaking deployment.

"Thanks to the Sailors that made our deployment happen," Reed said. "Also thanks to the community who supported the Abraham Lincoln CSG and the air wing—we couldn't do the mission without their support."

In addition to VAW-121, Strike Fighter Squadrons (VFA) 103 and VFA-143 returned to Oceana flying F/A-18E Super Hornets.

Naval aviators and supporting crewmembers assigned to Helicopter Sea Combat Squadron (HSC) 5 returned on Jan. 24 after flying more than 4,000 hours of dedicated operational tasking around the world.

Cmdr. Matthew Wright, HSC-5 Commanding Officer (CO), discussed his squadron's accomplishments while deployed saying the squadron lived up to their mission statement to "rescue, protect, deliver."

Cmdr. Patrice Fernandez, VFA-103 CO, led his squadron in completing 4,410 mishap-free flight hours while conducting operations in the 5th Fleet AO as part of five major joint exercises in support of coalition and joint operability. The squadron also completed 2,397 sorties, or missions, including 200 combat missions delivering more than 10,000 pounds of munitions. They also made 2,403 traps aboard Abraham Lincoln.

Cmdr. Justin Allen, VFA-143 CO, led his squadron in completing 2,600 sorties, 216 combat missions, while amassing 4,665 flight hours. During these missions, the squadron delivered more than 11,000 pounds of ordnance supporting Operations Inherent Resolve in Iraq and Syria, and Freedom Sentinel in Afghanistan. Pilots completed more than 2,000 traps.

"My squadron performed very well during this long cruise," Allen said. "We all worked very hard, and it's great to be home."

Cmdr. Martin Fentress Jr., VAW-121 CO, discussed his squadron's accomplishments which included amassing a total of 2,375 flight hours and 772 traps, of which

510 were accomplished at night. The squadron flew airborne command and control missions as part of CVW-7 while operating in the Mediterranean Sea before transiting to the North Arabian Sea and Arabian Gulf in support of Operation Sentinel.

"We've just completed the longest carrier deployment since the Vietnam War—the longest nuclear carrier deployment," said Fentress, who appreciated returning to colder temperatures, something he had not experienced for nearly 10 months.

The CSG executed more 1,285 sorties totaling 28,437 hours, to include 392 combat sorties encompassing 1,140 combat flight hours in direct support of friendly forces in Afghanistan and Syria. The air wing successfully employed 42 precision-guided munitions with a combined weight of over 70,000 pounds, destroying enemy targets and fighting positions in direct defense of coalition forces on the ground.

"I couldn't be more proud of the work that our team accomplished during this deployment," said Rear Adm. Michael Boyle, commander, CSG 12. "Over the course of 10 months the Sailors of the Abraham Lincoln CSG made a difference in some of the world's most critical waterways, ensuring the free flow of commerce and deterring aggression through strength and readiness. They can return home knowing that their service to our Navy and our nation made a positive difference."

The strike group was expedited to the 5th Fleet AO in early May, in response to credible threats to maritime security. Over the course of its seven months in theater, the strike group sustained critical presence operations to deter aggression.

While operating in the 6th Fleet AO, the CSG supported coalition theater security operation efforts and participated in multilateral maritime warfare exercises with militaries from Great Britain, Italy, Romania, Lithuania and Spain that promoted proficiency across platforms and services.

In the 7th Fleet AO, the CSG conducted flight operations inside the South China Sea in support of a free and open Indo-Pacific.

The conclusion of deployment also marks an important milestone for Abraham Lincoln as it completes a homeport shift from Naval Station Norfolk to NAS North Island.

Now at home in San Diego, Abraham Lincoln and its crew will undergo the next stage of the ship's operational and maintenance lifecycle, but not before Sailors have a chance to take some time to learn about their new homeport.

"San Diego is an incredible place to live and work, and the crew is looking forward to reconnecting with families and then getting out to explore," said Capt. Walt Slaughter, Abraham Lincoln CO. "While leaving Norfolk was bittersweet, ABE was originally a West Coast ship, so this is really a homecoming in more ways than one."

Written by Cmdr. Jennifer Cragg, Commander, Naval Air Force Atlantic Public Affairs, and Ensign Molly Fresher, USS Abraham Lincoln Public Affairs.

Theodore Roosevelt CSG Deploys

U.S. Navy photo by MC2 Kyle Carlstrom

SAN DIEGO—The Theodore Roosevelt Carrier Strike Group (TRCSG) departed San Diego for a scheduled Indo-Pacific deployment Jan. 17.

More than 6,000 Sailors assigned to Carrier Strike Group (CSG) 9 ships and units will provide maritime security, maintain freedom of the seas in accordance with international law and customs, and operate with international partners and allies to promote regional stability and prosperity.

"The U.S. Navy carrier strike group serves as the centerpiece of deterrence, providing our national command authority with flexible deterrent options and a visible forward presence," said Rear Adm. Stu Baker, commander, CSG-9. "The Theodore Roosevelt Carrier Strike Group trained hard, performed well, and is now ready to execute whatever missions we are assigned."

TRCSG consists of CSG-9, USS Theodore Roosevelt (CVN 71), Carrier Air Wing (CVW) 11, the Ticonderoga-class guided-missile cruiser USS Bunker Hill (CG 52), Destroyer Squadron 23 and the Arleigh Burke-class guided-missile destroyers USS Russell (DDG 59), USS Paul Hamilton (DDG 60), USS Pinckney (DDG 91), USS Kidd (DDG 100) and USS Rafael Peralta (DDG 115).

Theodore Roosevelt's embarked air wing consists of Strike Fighter Squadrons (VFA) 31, VFA-87, VFA-146, VFA-154, Carrier Airborne Early Warning Squadron (VAW) 115, Electronic Attack Squadron (VAQ) 142, Helicopter Maritime Strike Squadron (HSM) 75, Helicopter Sea Combat Squadron (HSC) 8 and Fleet Logistic Support Squadron (VRC) 30 Detachment 3.

From Carrier Strike Group 9 Public Affairs.

Triton UAS Arrives in 7th Fleet

PEARL HARBOR, Hawaii—The Navy's first MQ-4C Triton unmanned aircraft systems (UAS) have arrived in Guam for their initial deployment in the Pacific theater.

Unmanned Patrol Squadron (VUP) 19, the first Triton UAS squadron, will operate and maintain two aircraft as part of an Early Operational Capability (EOC) to further develop the concept of operations and fleet learning associated with operating a high-altitude, long-endurance system in the maritime domain.

The Tritons forward-deployed to Guam, both of which have arrived at Andersen Air Force base as of Jan. 26, will fall under Commander, Task Force (CTF) 72, lead for patrol, reconnaissance and surveillance forces in 7th Fleet.

"The introduction of MQ-4C Triton to the 7th Fleet area of operation expand the reach of the U.S. Navy's maritime patrol and reconnaissance force in the Western Pacific," said Capt. Matt Rutherford, commander of CTF-72. "Coupling the capabilities of the MQ-4C with the proven performance of P-8, P-3 and EP-3 will enable improved maritime domain awareness in support of regional and national security objectives."

The Navy's Persistent Maritime UAS program office at Naval Air Station Patuxent River, managed by Capt. Dan Mackin and industry partner Northrop Grumman, worked closely with VUP-19 in preparation for EOC. Prior to flying the aircraft to Guam, the team completed extensive operational test and unit level training.

"This significant milestone marks the culmination of years of hard work by the joint team to prepare Triton for overseas operations," Mackin said. "The fielding of the Navy's premier unmanned aircraft system and its additive, persistent, multi-sensor data collection and real-time dissemination capability will revolutionize the way maritime intelligence, surveillance and reconnaissance (ISR) is performed."

The Triton will conduct ISR missions that will complement the P-8A Poseidon and will bring increased persistence, capability and capacity through its multi-sensor mission payload.

"The inaugural deployment of Triton UAS brings enhanced capabilities and a broad increase in maritime domain awareness to our forward fleet commanders," said Rear Adm. Peter Garvin, commander, Patrol and Reconnaissance Group. "VUP-19, the Navy's first dedicated UAS squadron supported by an outstanding NAVAIR and industry team, is superbly trained and ready to provide the persistent ISR coverage the Navy needs."

Initial Operational Capability will include four air vehicles with capacity to support 24/7 operations.

From U.S. Pacific Fleet Public Affairs.

U.S. Navy photo by MC3 MacAdam Kane Weissman

An MQ-4C Triton unmanned aircraft system (UAS) idles on a runway at Andersen Air Force Base after arriving for a deployment.

U.S. Navy photos

This is the first of 16 special rework aircraft to be restored as part of the expanded Naval Sustainment System-Aviation initiative. This F/A-18E had only 31 flight hours when it was damaged during training.

CNAL, FRCSW Restore F/A-18E with Minimal Flight Time

NORFOLK, Va.—Capitalizing on the Naval Sustainment System-Aviation (NSS-A) culture, the Naval Air Forces (CNAL) F/A-18 Class Desk Department is restoring damaged aircraft with viable flight time and returning them to the operational inventory.

In September, the first of 16 special rework aircraft was returned to Strike Fighter Squadron (VFA) 106, at Naval Air Station (NAS) Oceana, Virginia, and then transferred to VFA-83 in time to meet a critical deployment.

The F/A-18E, which had only 31 hours of flight time, had been damaged during a training detachment in El Centro, California, and then trucked to Fleet Readiness Center Southwest (FRCSW) for repair. The designed life span of an F/A-18E/F is 6,000 hours.

Implemented by the Naval Aviation Enterprise (NAE) in 2019, NSS-A leverages best practices from commercial industry to update and improve aspects of Naval Aviation's maintenance practices across all maintenance levels.

"One of the positive outcomes of NSS-A is the culture shift to actively go after areas that need improvement while constantly seeking opportunities to seize the advantage to increase the operational inventory," said Capt. John Bush, director of Aircraft Materiel and Engineering for Naval Air Forces (CNAL).

The NAE not only achieved its sustainment goal but has turned its attention to all type, model, series and enabled the restoration of damaged Super Hornets with viable flight time, Bush said.

"We focused on several Super Hornets that required depot restoration and started tracking down the required parts to return these assets back into our inventory," said Todd Herbert, F/A-18 Class Desk Inventory Manager responsible for overseeing more than 1,200 aircraft worldwide.

Recently the class desk combined their efforts with FRCSW to restore special rework aircraft.

"We focused on getting the right parts and tools needed to complete the restoration and repair of this jet and others similar to it," Herbert said.

"When we first starting looking at the possibility of repairing this aircraft, we asked our counterparts at FRCSW a rough order of magnitude on what it would cost to repair," Herbert said. "Once we received the cost for materials, we requested funding, ordered the parts and started to repair the aircraft at FRCSW at Naval Air Station North Island."

"These aircraft are integral to the success of Naval Aviation," said Ehren Terbeek, a program manager at FRCSW.

Restoring this aircraft represents successful support for the warfighter, he added.

In a collaborative effort, FRCSW and FST engineering were able to design TUB repairs on the 591 bulkhead of the fuselage specifically to aircraft 166819.

"At FRC Southwest, we rely on CNAL to provide us what we require to get the aircraft out the door," said Terbeek. "Once the aircraft was getting put back together, they provided logistics support for repairable and consumable parts so we could get the aircraft operational for a critical deployment with VFA-83."

"I knew we could fix this aircraft; it was a long process due to the aircraft's specialized design, parts and procurement through the supply system," Terbeek said.

"The entire Naval Aviation team came together as one unit to repair this aircraft," Herbert said. "We intend to continue this partnership as we work to restore several more low-flight-hour aircraft in various stages of restoration."

Written by Cmdr. Jennifer Cragg, Commander, Naval Air Force Atlantic Public Affairs.

U.S. Navy photo by Lt. Cmdr. Rick Healey

A U.S. Naval Academy midshipman conducts a simulated T-6B Texan II flight on a newly installed virtual reality trainer device at the academy during Aviation Selection Night.

Midshipmen Get Virtual Start to Pilot Training

ANNAPOLIS, Md.—Midshipmen got a 360-degree view of flight training Jan. 9 during Aviation Selection Night at the U.S. Naval Academy marking a new era in technology for prospective flight students.

In a partnership between Chief of Naval Air Training (CNATRA), Naval Air Systems Command and Naval Air Warfare Center Training Systems Division, the academy launched two virtual reality (VR) trainer devices during the event.

The VR trainers will help prepare midshipmen selected for flight training in an "early start" concept, said Capt. Ryan Bernacchi, deputy commandant for leadership and character development and senior naval aviator at the academy.

"We are thrilled by the arrival of the Naval Academy's first two T-6B Texan II VR flight simulators," Bernacchi said. "Their delivery has generated quite a buzz, and our midshipmen are eager to get in and start to get a feel for what's coming next for those who are selected for flight training upon graduation."

Implementing VR trainers is a historic step for the academy's aviation program.

35,000th Helicopter Pilot Winged at NAS Whiting Field

MILTON, Fla.—Training Air Wing (TAW) 5 celebrated a milestone when the 35,000th rotary wing student naval aviator walked across the stage at Naval Air Station Whiting Field to receive his coveted "Wings of Gold" Nov. 22.

Lt. j.g. Robert Woods walked off the stage at Lassen Auditorium as the Navy's newest helicopter pilot. He joined 22 other students in achieving this sought after designation.

While he recognizes being the milestone pilot was largely a matter of luck, it is still a hallmark he cherishes, Woods said.

"I feel incredibly honored and lucky to have the distinction of being the 35,000th winger," Woods said. "We all work extremely hard to earn our Wings of Gold and this milestone is a reminder of all who have gone before us."

Woods will go on to fly the MH-60R Seahawk helicopter with the "Airwolves" of Helicopter Maritime Strike Squadron (HSM) 40 in Jacksonville, Florida.

From Naval Air Station Whiting Field Public Affairs.

U.S. Navy photo by Lt. Michelle Tucker

TH-57 Sea Ranger helicopter assigned to TAW 5.

The two devices will allow students to experience virtual flight in a T-6B Texan II, the aircraft used during primary flight training for the Navy, Marine Corps and Coast Guard. The objective is to deliver newly commissioned officers to CNATRA who already possess some familiarity with T-6B procedures and subsequently deliver winged aviators more quickly to the fleet.

"The Naval Academy has always had a robust seamanship training program utilizing training patrol craft and sailboats, but we haven't had the ability to do any aviation training on the Academy Yard in over 100 years," Bernacchi said. "I'd like to express a huge thank you to our Air Boss, Vice Adm. Dewolfe Miller, commander, Naval Air Forces; Rear Adm. Greg Harris, director Air Warfare; and Rear Adm. Daniel Dwyer, CNATRA, for bringing cutting edge VR trainers to the Naval Academy."

The VR trainers , already set up and in use, could also provide a future opportunity for academy leadership look at ways to assess aptitude and motivation for the competitive selection process for Naval Aviation.

In 1911, the Navy's first airplane was delivered in crates and assembled in Dahlgren Hall, under the supervision of Naval Aviator No. 1, Lt. Theodore "Spuds" Ellyson. Successful flight operations commenced the next day, and from 1911-1913, the Naval Academy was established as the Navy's first naval air station. In 1913, Naval Air Station (NAS) Pensacola, Florida, was established and operations shifted south to more favorable winter weather.

This year's aviation selectees included 275 midshipmen selected for pilot training and almost 50 selected for naval flight officer training. Upon graduation, these men and women will report to the "Cradle of Naval Aviation" at NAS Pensacola.

Written by Lt. Michelle Tucker, Chief of Naval Air Training Public Affairs.

CMV-22B Osprey Takes First Flight

AMARILLO, Texas—The CMV-22B Osprey completed its first flight at Bell Textron Inc.'s Amarillo Assembly Center Dec. 19. The CMV-22B is the latest variant of the tiltrotor fleet, joining the Marine Corps MV-22 and Air Force CV-22.

"The Navy is getting the benefits of a proven platform, with the enhancements designed for the carrier onboard delivery (COD) mission," said Marine Col. Matthew Kelly, program manager for the V-22 Joint Program. "We expect this aircraft to arrive to the fleet and start making an impact in 2020."

The CMV-22B is designed to replace the C-2A Greyhound for transporting personnel, mail, supplies and high-priority cargo from shore bases to aircraft carriers at sea. The Navy variant was designed for carrier fleet operations by providing increased fuel capacity for the extended range requirement, traveling up to 1,150 nautical miles. To achieve the new range, two new 60-gallon tanks were installed in the wing for additional fuel and the forward sponson tanks were redesigned for additional capacity.

In addition, the CMV-22 variant has a beyond line-of-sight HF radio, a public address system for passengers and an improved lighting system for cargo loading. The aircraft will also be capable of internally transporting the F-35C Lightning II engine power module.

Bell Boeing will deliver the first CMV-22B to Air Test and Evaluation Squadron (HX) 21 in early 2020 for developmental test. Fleet Logistics Multi-Mission Squadron (VRM) 30, the first CMV-22 squadron located at Naval Air Station North Island, California, will receive aircraft in 2020.

From V-22 Joint Program Office Public Affairs.

Photo courtesy Bell Textron Inc.

The CMV-22B Osprey made its first flight Dec. 19 at Bell Textron Inc.'s Amarillo Assembly Center in Texas.

USS Gerald R. Ford Conducts Aircraft

U.S. Navy photo by MC3 Zachary Melvin

A C-2A Greyhound, assigned to Air Test and Evaluation Squadron (VX) 20, prepares to land on the flight deck of the aircraft carrier USS Gerald R. Ford (CVN 78).

U.S. Navy photo by MC Riley McDowell

An F/A-18F Super Hornet, assigned to VX-23, prepares to launch from the flight deck of the Ford.

An E-2D Advanced Hawkeye with VX-20 prepares to launch from Ford's flight deck.

U.S. Navy photo by MC Angel Jaskuloski

By USS Gerald R. Ford Public Affairs

Aircraft carrier USS Gerald R. Ford (CVN 78) departed its homeport of Norfolk, Virginia, Jan. 16 to begin Aircraft Compatibility Testing (ACT) off the East Coast as the first aircraft, an E-2D Advanced Hawkeye, landed onboard.

ACT continues the at-sea testing of Electromagnetic Aircraft Launch System (EMALS) and Advanced Arresting Gear (AAG)—two aircraft launch and recovery equipment (ALRE) systems unique to Ford—previously conducted in 2018 with the F/A-18 E/F Super Hornet.

During this phase of ACT, compatibility testing will include the following platforms: T-45 Goshawks, F/A-18 E/F Super Hornets and E/A-18G Growlers from Air Test and Evaluation Squadron (VX) 23; and E-2Ds and C-2A Greyhounds from VX-20. This will be the first time the T-45, E-2D, C-2A and E/A-18G aircraft will launch and recover from the Navy's newest aircraft carrier.

"Ford is now proving all of the test-work accomplished at Joint Base McGuire-Dix-Lakehurst, New Jersey, over the last year-and-a-half, that we can fly fleet aircraft as a ship with EMALS and AAG integrated," said Cmdr. Mehdi "Metro" Akacem, Ford's Air Boss. "This is the culmination of a year-and-a-half of training, anticipation and teamwork."

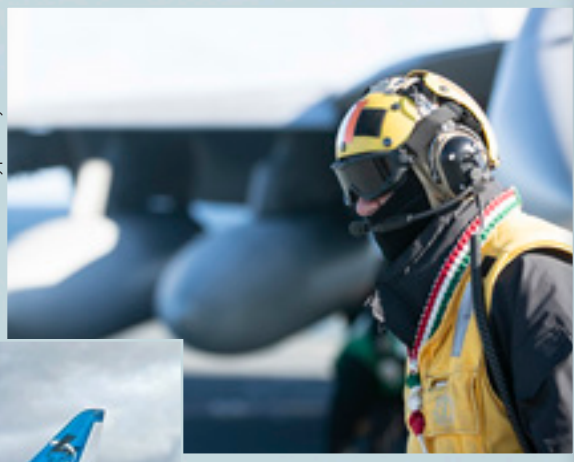
Ford last flew aircraft in January 2018 and has 747 launches and arrestments to date. This round of testing will allow the crew to further test the improvements made during its post-shakedown availability (PSA) at Huntington Ingalls Industries-Newport News Shipbuilding while also allowing the crew to gain experience on these unique systems.

"This is one of the reasons why I love the Navy," said Aviation Boatswain's Mate Airman Xavier Pettway. "It's crazy to think about. Even when we were doing drills on the flight deck my heart was beating so fast, and now, we're doing it for real. It's unreal, but I'm ready for it."

EMALS is the launch system of choice for Ford and all future Ford-class aircraft carriers. Its mission and function remains the same as traditional steam catapults; however, it employs entirely different technologies. EMALS uses stored kinetic energy and solid-state electrical power conversion. This technology permits a high degree of computer control, monitoring and automation. The system will also provide the capability for launching all current and future carrier air wing platforms—lightweight unmanned to heavy strike fighters.

The software-controlled AAG is a modular, integrated system that consists of energy absorbers, power conditioning equipment and digital controls, with architec-

Compatibility Testing



U.S. Navy photo by MC2 Sean Elliott

An Aviation Boatswain's Mate (Handling), prepares to move an F/A-18F Super Hornet aboard Ford's flight deck.

U.S. Navy photo by MC2 Ruben Reed

A T-45 Goshawk, assigned to VX-23, lands aboard Ford.

ture that provides built-in test and diagnostics, resulting in lower maintenance and manpower requirements. AAG is designed to provide higher reliability, increased safety margins and reduce the fatigue impact load on aircraft. Similar to EMALS, it will also allow for the arrestment of all current and future air wing assets.

The information captured during ACT will continue to inform improvements and modifications for Ford and follow-on carriers.

For Rear Adm. Roy "Trigger" Kelley, commander, Naval Air Force Atlantic, a successful ACT also serves as an important stepping stone toward Ford's eventual Flight Deck Certification, expected to take place in March.

"Once Ford's flight deck is certified, she will become my go-to aircraft carrier responsible for conducting carrier qualifications on the East Coast for the Navy's newest fleet and training command aviators," Kelley said. "This will be a significant boost to aircraft carrier availability and overall fleet operational readiness."

Rear Adm. James P. Downey, Program Executive Officer for Aircraft Carriers, emphasized that Ford's ACT marks yet another successful milestone on the path to recertification of the flight deck and full mission capability.

"Acting SECNAV [Thomas B. Modly] was crystal clear when he directed all hands on deck, and I can tell you that everyone—from the highest levels of government to the crew on the deck plates and our industry partners—is laser focused on USS Gerald R. Ford being ready to enter fleet service," Downey said.

Wrtten by USS Gerald R. Ford Public Affairs.

Ford-Class Carriers

The next generation aircraft carrier, the Gerald R. Ford-class was ordered in September 2008 and delivered in 2017 as the force structure replacement for USS Enterprise (CVN 65), which inactivated in 2012.

The Ford-class replaces the Enterprise- and Nimitz-class aircraft carriers. The lead ship, USS Gerald R. Ford (CVN 78), was commissioned in 2017. The class brings improved warfighting capability, quality of life improvements for Sailors and reduced total ownership costs.

Improvements will be implemented on the next two carriers: Pre-Commissioning Unit John F. Kennedy (CVN 79) christened December 2019 and Enterprise (CVN 80), which is expected to be delivered to the fleet by 2028.

The newly named USS Doris Miller (CVN 81) is expected to be delivered by 2032.

Each ship in the new class is expected to save nearly $4 billion in total ownership costs during its 50-year service life, compared to the Nimitz-class. Designed to maximize the striking power of the embarked carrier air wing, CVN-78 is designed to operate effectively with almost 700 fewer crew members than a CVN 68-class ship New technologies and ship design features are expected to reduce watch standing and maintenance workload for the crew.

Ford is the first carrier designed with all electric utilities, eliminating steam service lines from the ship, reducing maintenance requirements and improving corrosion control. The new A1B reactor, Electromagnetic Aircraft Launch System, Advanced Arresting Gear and Dual Band Radar all offer enhanced capability with reduced manning.

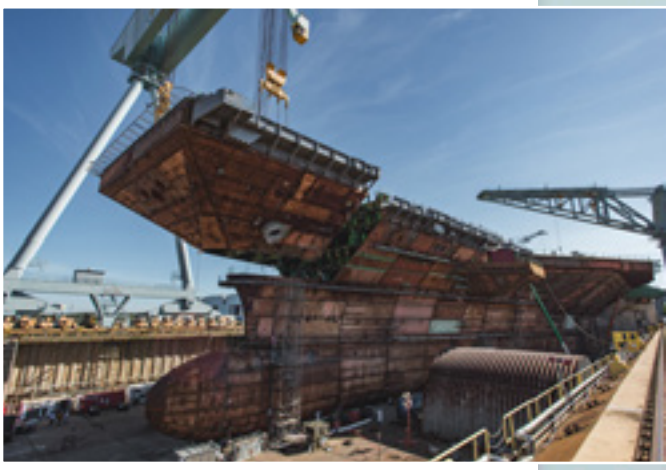


Photo by Matt Hildreth courtesy of Huntington Ingalls Industries

The USS John F. Kennedy (CVN 79) while under construction in 2019.

ADVANCED ARRESTING GEAR
Achieves Fast-Paced Operations

By Connie Hempel

The Navy's newest aircraft recovery system, Advanced Arresting Gear (AAG), successfully completed the system's most demanding test event to date with 22 aircraft arrestments in just over 26 minutes at the Runway Arrested Landing Site (RALS) in Lakehurst, New Jersey.

U.S. Navy photo by Sherry Jacob

An F/A-18 Super Hornet with Air Test and Evaluation Squadron (VX) 23 catches the wire of the Advance Arresting Gear (AAG) during testing Oct. 23-24.

The two-day series of testing Oct. 23-24 evaluated the AAG thermal management system's ability to remove heat generated during fast-paced flight operations as experienced aboard the aircraft carrier to validate the system's capability to meet USS Gerald R. Ford's (CVN 78) operational requirements.

"This never-before accomplished test event was effectively executed with herculean efforts by a collaborative program office-fleet team," said Capt. Ken Sterbenz, Aircraft Launch and Recovery Equipment Program manager.

In addition to AAG team personnel, Naval Air Warfare Center Aircraft Division Lakehurst and industry partner General Atomics, the testing involved five F/A-18E/F Super Hornets and 25 maintainers from Carrier Air Wing (CVW) 8, six pilots from Air Test and Evaluation Squadron (VX) 23 and two Sailors from CVN 78.

"This achievement represents a significant datapoint for AAG performance as experienced at our single engine land-based site," Sterbenz said. "I'm highly confident with AAG going into CVN 78 Aircraft Compatibility Testing early next year where the full, three-engine recovery system configuration will be utilized."

The Navy has made significant progress in maturing the latest carrier-based launch and recovery technologies—the Electromagnetic Aircraft Launch System (EMALS) and AAG system.

As of September 2019, the EMALS test program has completed more than 3,800 dead-loads, or weighted sleds, and more than 530 aircraft launches at the System Functional Demonstration test site. The AAG test program has completed more than 2,600 dead-load arrestments at the Jet Car Track Site and more than 1,570 aircraft arrestments at RALS. These three land-based test facilities are located at Joint Base McGuire-Dix-Lakehurst, New Jersey.

CVN 78 is the Navy's most technologically advanced aircraft carrier and the first to deploy AAG and EMALS. To date, she has successfully executed 747 sorties.

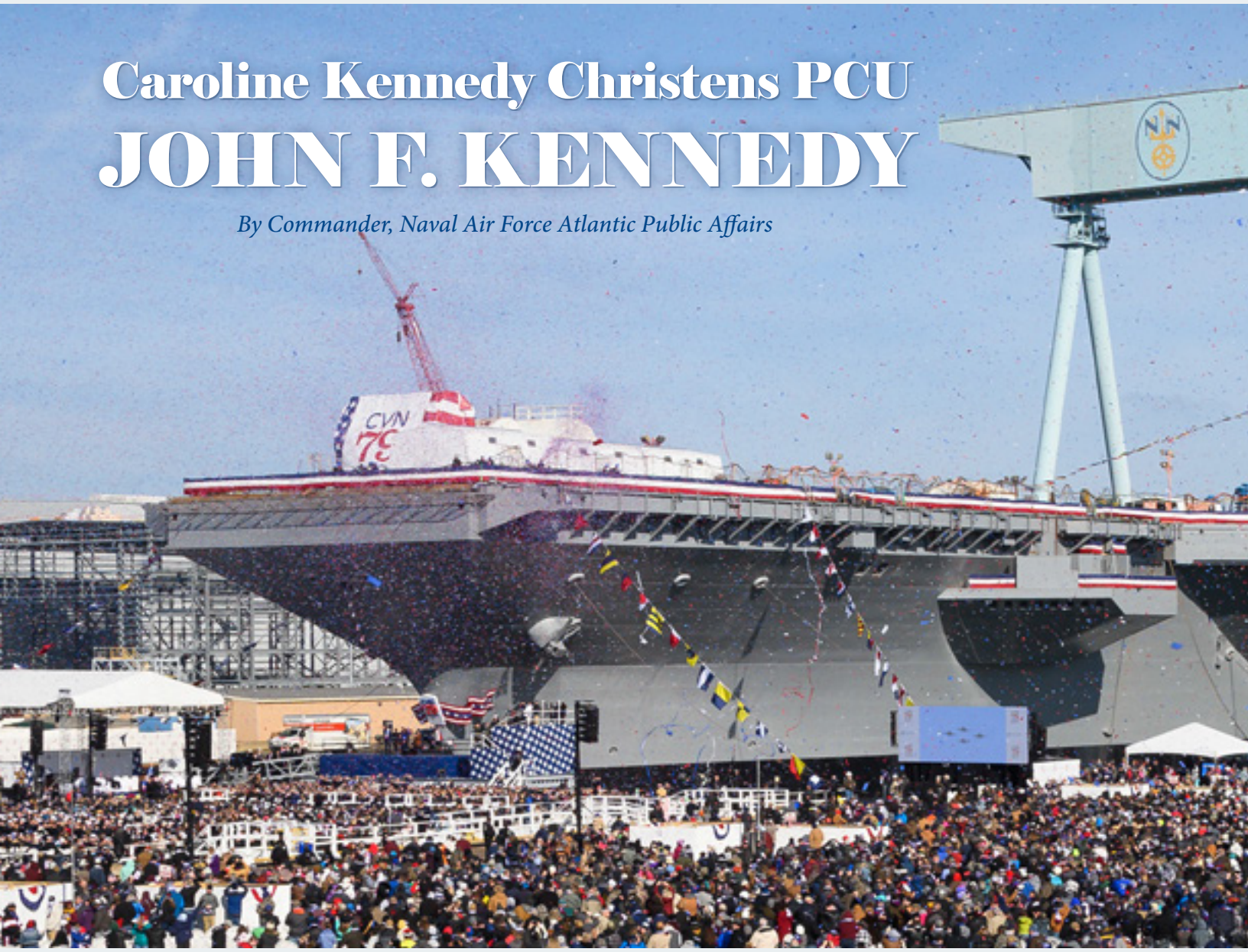
Connie Hempel is the Public Affairs Officer for Program Executive Officer (Tactical).

VX-23 conducts Advanced Arresting Gear (AAG) testing with five F/A-18E/F Super Hornets on Oct. 23-24 at the Runway Arrested Landing Site in Lakehurst, New Jersey.

U.S. Navy photo by Sherry Jacob

Caroline Kennedy Christens PCU JOHN F. KENNEDY

By Commander, Naval Air Force Atlantic Public Affairs



With more than 20,000 attendees, President John F. Kennedy's daughter, Caroline Bouvier Kennedy, former U.S. Ambassador to Japan, officially christened Pre-Commissioning Unit (PCU) John F. Kennedy (CVN 79) during a Huntington-Ingalls Industries' Newport News Shipbuilding (HII-NNS) division ceremony in Newport News, Virginia, on Dec. 7.

On Dec. 16, the ship was launched and guided by tugboats a mile down the James River to the shipyard's outfitting pier.

During the christening, Kennedy thanked the Navy, Newport News Shipbuilding, as well as the leadership and crew of CV-79 for their efforts to build the warship.

"I'm so proud to be the sponsor of this ship and bring her to life," Kennedy said. "The CVN-79 crew is fortunate to have such distinguished leaders, this is your day, and our chance to say 'thank you.'"

Caroline reprised her role as sponsor for the John F. Kennedy (CVN 79). As a 9-year-old girl, Caroline broke the bottle of sparkling wine on the hull of the first USS John F. Kennedy (CV 67) in May 1967, which marked the beginning of the end of an era for conventionally powered aircraft carriers.

Kennedy reflected on the first ship to bear her father's name and how the second Ford-class aircraft carrier will continue to represent her father proudly.

"Having a chance to get to know the people who served on the USS John F. Kennedy (CV 67), really gave me insight into who he was, and what kind of leader he was in a way that I wouldn't have had any other way. And, I know that's going

Photo by Ben Scott courtesy of Huntington Ingalls Industries

U.S. Navy photo by MC3 Samuel Lee Pederson

Ship's sponsor Caroline Kennedy christens the aircraft carrier John F. Kennedy (CVN 79) during ceremony Dec. 7 at Newport News Shipbuilding division. Also pictured (left to right) are Charles Frank Bolden Jr., former NASA administrator; John Kerry, former Secretary of State; Capt. Todd Marzano, the ship's prospective Commanding Officer; Tatiana Schlossberg, the sponsor's daughter; Newport News Shipbuilding President Jennifer Boykin; and Edwin Schlossberg, the sponsor's husband.

Photo by Matt Hildreth courtesy of Huntington Ingalls Industries

to be just as true now with a whole new generation," Kennedy said.

Former NASA Administrator and retired U.S. Marine Corps Maj. Gen. Charles F. Bolden Jr. emphasized the important role of the 35th president to the nation and the continuation of his legacy through the second Ford-class aircraft carrier during his address.

"This carrier is a tangible example of the legacy of the great man who risked his own life during World War II and the wake of Pearl Harbor," said Bolden, who added that PCU USS John F. Kennedy will join an elite group of aircraft carriers unmatched in strength around the world.

"This carrier is a tangible example of the legacy of the great man who risked his own life during World War II and the wake of Pearl Harbor."

Also in attendance was Thomas B. Modly, Acting Secretary of the Navy, who discussed the significance of the day's event.

"Today is the anniversary of the attack on Pearl Harbor, a day that forever changed the lives of brave American warriors like John F. Kennedy and transformed the way we fought as a Navy," Modly said. "Much has changed over

Photo by Matt Hildreth courtesy of Huntington Ingalls Industries

PCU John F. Kennedy (CVN 79) is moved from Newport News Shipbuilding's Dock Dry on Dec. 16.

Photo by Ashley Cowan courtesy of Huntington Ingalls Industries

Newport News Shipbuilding division successfully launched PCU John F. Kennedy (CVN 79) into the James River on Dec. 9, four weeks ahead of the original schedule.

the past 78 years, but our nation, and our world, still needs brave American Sailors like the ones who will operate and serve on this ship. Kennedy knew what it meant to serve, to lead and to sacrifice and his legacy will continue with you."

Capt. Todd Marzano, Commanding Officer of CV-79, emphasized the importance of this moment during the life of the aircraft carrier, which is 67 percent complete.

"CVN 79 has come a long way since I first observed initial construction in the dry dock back in 2015, following the keel laying," Marzano said. "I'm incredibly honored, humbled and excited to be given the opportunity to lead such an amazing team of high-quality crew members."

CVN 79 incorporates more than 23 new technologies, comprising dramatic advances in propulsion, power generation, ordnance handling and aircraft launch and recovery systems. These innovations will support a 33 percent higher sortie generation rate at a significant cost savings, when compared to Nimitz-class carriers.

From Commander, Naval Air Force Atlantic Public Affairs.

JFK Sailors Reflect on Christening

Sailors assigned to Pre-Commissioning Unit (PCU) USS John F. Kennedy (CVN 79) reflected on the milestone event in the ship's construction on Dec. 7—the anniversary of the attack on Pearl Harbor.

Hospital Corpsman 1st Class Michael Leonard emphasized the importance of this poignant moment in history.

"There's a great deal of pride in taking a vessel from dry dock to active service, not to mention the gravity and honor in having the opportunity to impact the legacy of USS John F. Kennedy," Leonard said.

Lt. Cmdr. Valerie Greenaway, who had an opportunity to stand under the keel prior to the flooding of the dry dock Oct. 1, emphasized the impact the ship builder has on constructing the future Ford-class aircraft carriers.

"The shipyard is creating this incredible body, but we are the group that will give it a soul and bring it to life," Greenway said. "This carrier will be an integral part of defending our nation and global interests. I never imagined that I would be a part of something with so much impact. To say that I am proud to be assigned to the future USS John F. Kennedy is an understatement."

Senior Chief Aviation Electronics Technician William Martel reflected on being a part of something much larger than himself.

"The life of the future USS John F. Kennedy will last five decades beyond its commissioning, and for me that gives me pride in knowing that I am a part of something bigger than myself," said Martel, who brings three separate shipyard tours of experience to the carrier.

Chief Information Systems Technician Yolanda Corro, one of 250 Sailors assigned to CVN-79 is honored to play a role in the christening ceremony.

"Being part of the PCU John F. Kennedy is an honor. I joined the Navy Dec. 7,2004, and have been on active duty for 15 years, and now celebrating the christening of this incredible ship is a real honor for me," Corro said.

Master-at-Arms 1st Class Kristi Dennis emphasized the traditions her crew will set.

"It's a great honor and humbling experience to not only create new traditions with PCU JFK but also know I am a part of carrying on the traditions of the Navy for many generations," Dennis said.

Written by Commander, Naval Air Force Atlantic Public Affairs

Ford-Class Aircraft Carrier Named After WWII Hero Miller

Acting Secretary of the Navy Thomas B. Modly named a future aircraft carrier USS Doris Miller (CVN 81) during a Martin Luther King Jr. Day ceremony honoring African Americans in Pearl Harbor, Hawaii, Jan. 20.

In this file photo taken May 27, 1942, Adm. Chester Nimitz awards the Navy Cross medal to Mess Attendant 2nd Class Doris Miller for his actions aboard the battleship USS West Virginia (BB-48) during the Dec. 7, 1941, Japanese attack on Pearl Harbor.

Thomas B. Modly, right, poses for a group photo with the Miller family after the unveiling of the new Ford-class aircraft carrier USS Doris Miller (CVN 81) at a Dr. Martin Luther King Jr. Day celebration event at Joint Base Pearl Harbor-Hickam.

The backdrop for the day's ceremony paid homage to the beginning and ending of America's role in World War II and the scene where Doris Miller's heroic actions cemented him into books of American history.

This will be the second ship named in honor of Miller. It is the first aircraft carrier named for an African-American and the first aircraft carrier to be named in honor of a Sailor for actions while serving in the enlisted ranks.

"In selecting this name, we honor the contributions of all our enlisted ranks, past and present, men and women, of every race, religion and background," Modly said. "Dr. Martin Luther King, Jr. observed, 'Everybody can be great, because anybody can serve.' No one understands the importance and true meaning of service than those who have volunteered to put the needs of others above themselves."

On Dec. 7, 1941, Miller was collecting laundry on the battleship West Virginia (BB-48) when the attack from Japanese forces commenced. When the alarm for general quarters sounded he headed for his battle station, an anti-aircraft battery magazine, only to discover that torpedo damage had wrecked it.

Miller was ordered to the ship's bridge to aid the mortally wounded commanding officer, and subsequently manned a .50 caliber Browning anti-aircraft machine gun until he ran out of ammunition. Miller then helped move many injured Sailors as the ship was ordered abandoned due to her own fires and flaming oil floating down from the destroyed Arizona (BB-33). West Virginia lost 150 of its 1,500-person crew.

Miller's actions during the attack earned him a commendation from then Secretary of the Navy Frank Knox and the Navy Cross, which was presented to him personally by Adm. Chester Nimitz, commander, U.S. Pacific Fleet at the time.

In 1943, Miller died aboard USS Liscome Bay (CVE 56) when the ship was hit by a torpedo and sank off Butaritari Atoll in the Gilbert Islands.

"Doris Miller stood for everything that is good about our nation, and his story deserves to be remembered and repeated wherever our people continue the watch today," Modly said.

From Acting Secretary of the Navy Public Affairs.

TEAM SOLVES CH-53K Engine Integration ISSUES

By Victoria Falcón

Industry and government engineers have mitigated an ongoing engine integration issue for the CH-53K King Stallion—the Marine Corps new heavy-lift helicopter.

This "tiger team" of experts from a variety of engineering backgrounds came together to find and optimize aircraft modifications using state-of-the-art computational modeling methodologies, risk management, flight test data and systems engineering tools.

"Bringing together the tiger team exemplifies the importance and purpose of an integrated test team," said Col. Jack Perrin, program manager, Heavy Lift Helicopter Program Office. "It was great to see the team turn the corner for the program and produce a resolution to an ongoing problem. This was a priority for the Naval Air Systems Command, industry and the Marine Corps, and the team hit it out of the park."

The program office oversees both the CH-53E Super Stallion, which is currently in use by the Marine Corps, and the CH-53K.

The CH-53K is the premier heavy-lift helicopter that will expand the fleet's ability to move more material more rapidly. That power comes from three new General Electric T-408 engines, which are more powerful and more fuel-efficient than the T-64 engines currently outfitted on the CH-53E.

According to Debbie Cleavenger, assistant program manager for engineering and the program office's chief engineer, three engines created several integration issues, including the most troublesome—exhaust gas re-ingestion (EGR).

"EGR occurs when the hot engine gasses are ingested back into the system," Cleavenger said. "It can cause anything from increased life-cycle costs, poor engine performance and degradation, time-on-wing decreases, engine overheating and even engine stalls."

Since April 2019, the tiger team completed more than 30 test events and evaluated 135 potential design solutions for engine integration.

"The systems constraints were significant," Cleavenger said. "One change impacted multiple systems."

Team members worked different root cause analyses in parallel, determining the cause and developing design models to mitigate causes for EGR. From those models, iterative flight testing resulted in a validated model to assess the most promising answer.

That model was then used to construct components for one of the partners, conducted the LogDemo with the Marine Operational Test and Evaluation Squadron (VMX) 1 maintainers at Marine Corps Air Station New River, North Carolina. The team completed more than 3,500 hours of ground test events.

"Although the window for performance is considered complete for LogDemo, we are still making opportunities to evaluate maintenance for data collection," said Todd Winstead, CH-53K ST&E LogDemo lead.

The LogDemo kicked off an on-going

U.S. Marine Corps photo by Cpl. Ethan Pumphret

Marines with Marine Operational Test & Evaluation Squadron (VMX) 1 load the main gearbox of the CH-53K King Stallion onto the aircraft aboard Marine Corps Air Station New River, N.C., as part of a Logistics Demonstration.

CH-53K Logistics Demo Improves Maintenance for Fleet

Data collected during a recent Logistics Demonstration (LogDemo) for the CH-53K King Stallion heavy-lift helicopter is already paying dividends as the aircraft moves closer to fleet introduction for Operational Test and Evaluation in 2021.

Maintenance data collection and analysis is an ongoing part of the King Stallion program, but the LogDemo was a unique opportunity to put the CH-53K through its paces in test and development, while giving fleet personnel touch-time on the aircraft. Marine Corps participation in evaluating the integrated product support (IPS) elements is key to future readiness.

During the past 15 months, the CH-53K Supportability Test and Evaluation (ST&E) team, including industry and government

Colored oil smoke indicates rotor wake and wind effects while external "tufts" adhere to the outside of the CH-53K King Stallion showing surface airflow during testing, which validated a modification mitigating exhaust gas re-ingestion.

U.S. Navy photo

test aircraft that flew a rigorous series of test flights to collect data to validate the model. The extensive set of flight test data was then condensed, analyzed and presented in December 2019 to show that the result performed as predicted and provided an overall design modification that would meet the needs for the CH-53K fleet aircraft.

All CH-53Ks built for the fleet will incorporate this production solution. Only one test aircraft has been modified to the production solution, since it would not be cost-effective or beneficial to the program to modify them all.

"This is exactly what an integrated test team is supposed to do," Perrin said. "Bring their expertise to a project, look for resolutions in a dynamic and collaborative environment, determine the best path forward and keep this aircraft on track to the fleet."

EGR testing was executed within the reprogrammed CH-53K program execution timeline to support Initial Operational Capability in 2021. The CH-53K is continuing toward completion of developmental test, leading to Initial Operational Test and Evaluation in 2021, followed by first fleet deployment in 2023/2024.

Victoria Falcon provides strategic communications for the Heavy Lift Helicopter Program.

process of observation, identification and analysis in the logistics process for the CH-53K, he added.

"LogDemo has helped us in early discovery of maintenance deficiencies, providing lead-time for improving product support prior to commencing operational test," he said. "It will also increase efficiency for aircraft availability."

"In LogDemo, we took an actual CH-53K aircraft apart and rebuilt it, documenting the process every step of the way," said Lt. Col. Julian Rosemond, CH-53K product support lead. "The LogDemo gave our Marines advanced practical experience and improved problem-solving skills. They were able to obtain qualifications and improve their capability to perform function tests to be prepared for squadron stand-up."

LogDemo was a win-win for all involved, he said. The team received real-time assessments by working with fleet Marines. The entire program gathered valuable data to correct and improve logistics support products that will lead to increased efficiency and accuracy in the performance of future maintenance operations.

A key to the LogDemo is the verification of data in the Interactive Electronic Technical Manual (IETM) modules using an iterative approach. The IETM is a digital manual that contains technical procedures that guide the maintainers in accurately removing and installing components; performing troubleshooting and functional tests; identifying replacement parts; and interfacing peculiar support equipment to perform tasks.

The team evaluated critical maintenance tasks while conducting verification of IETM procedures—from the use of support equipment to the specific tools used to perform maintenance. For example, during the evaluation for removing and installing a major component, Marines identified discrepancies with IETMs and steps missing to adequately perform torqueing and measuring for installing a main rotor head, thus requiring technical/engineering support to correct procedures.

"If not for LogDemo and the discovery of the improper procedures, serious damage or failure to a critical safe-for-flight component could have occurred," Winstead said.

However, because of LogDemo, that risk was avoided and the documentation has been corrected, he said.

Though the LogDemo is now complete, the team's work continues in providing deficiency reports and report summaries. The team is also preparing for future testing, including the CH-53K sea trials, which will occur later this year.

VMFA-314: FIRST MARINE CORPS SQUADRON TRANSITIONS TO F-35C

By Lt. Cmdr. Lydia E. Bock

Under instruction of the Navy's F-35C fleet replacement squadron (FRS), Strike Fighter Squadron (VFA) 125, the Marine Fighter Attack Squadron (VMFA) 314 began transitioning from legacy F/A-18C Hornets to the F-35C Lightning II on Sept. 30.

VMFA-314's transition from legacy Hornets to the F-35C began last June during a sundown ceremony aboard Marine Corps Air Station (MCAS) Miramar, California, where the "Black Knights" formally retired their last F/A-18C Hornet and simultaneously embarked on the path to becoming the first Marine Corps squadron to fly the F-35 carrier variant. All previous Marine Corps F-35 transitions have been to the F-35B STOVL variant.

"This transition process really began at the sundown ceremony in February at Miramar," said VMFA-314 Commanding Officer Lt. Col. Cedar Hinton.

Since then, VMFA-314 has been moving toward becoming a fully operational F-35C squadron. Starting at the end of September, VMFA-314 has been spending the latter portion of 2019 at NAS Lemoore preparing for Safe-For-Flight Operations Certification (SFFOC).

VMFA-314 is part of Marine Aircraft Wing (MAW) 3, Marine Aircraft Group (MAG) 11, located at Marine Corps Air Station Miramar, Calif.

SFFOC is the final milestone for VMFA-314's transition to the F-35C. This process ensures a squadron is manned with qualified personnel to implement maintenance and safety programs in support of fleet operations. All transitioning squadrons are required to complete this certification prior to independently conducting flight operations.

The "Rough Raiders" of VFA-125 at NAS Lemoore play a critical role in transitioning VMFA-314 pilots and maintainers to the F-35C and ultimately achieving their SFFOC. When introducing a new aircraft to the fleet, the appropriate FRS

Lt. Col. Cedar L. Hinton, Commanding Officer of Marine Wing Fighter Attack Squadron (VMFA) 314, 3rd Marine Aircraft Wing lands VMFA-314's first F-35C Lightning II on Marine Air Station Miramar, Calif., on Jan. 21.

U.S. Marine Corps photo by Sgt. Dominic Romero

is assigned oversight responsibility for the transitioning unit. VFA-125 was reactivated in January of 2017 to fulfill FRS role for the F-35C.

SFFOC encompasses areas such as equipment, personnel and programs. Not least among them is the requirement for the squadron to be in the physical custody of at least 30 percent of the assigned aircraft.

The transition process for VMFA-314 at NAS Lemoore will last roughly six to seven months, with a large portion of the squadron returning to Miramar in early 2020 to prepare for SFFOC evaluations and inspections happening on-site later next spring. The Black Knights will receive their first aircraft at this time.

"VMFA-314's success would not be possible without the tireless support of VFA-125, the F-35C Fleet Integration Team (FIT) and Commander, Joint Strike Fighter Wing (CJSFW)," Hinton said. "

A factor in VMFA-314's transition is their familiarity with the F-35 program. While the Navy and Marine Corps F-35C program declared Initial Operational Capability (IOC) in February 2019, the Marine Corps F-35B program accomplished IOC in July of 2015, exposing more personnel to the program. While the aircraft and many of the qualifications needed for VMFA-314's SFFOC may be different, the program mindset translates well between the STOVL and carrier variant.

"The Rough Raider team is already working with VMFA-314's pilots and maintainers as they make the transition to the F-35C," said VFA-125 Commanding Officer Capt. Adan Covarrubias. "While many of the pilots and maintainers making this transition have previous experience in operational, test and training F-35B squadrons, the formal introduction to the carrier variant begins here at NAS Lemoore."

More than 65 percent of VMFA-314 maintainers have F-35B qualifications that can be carried over to the F-35C variant. During their time at NAS Lemoore, the Black Knights will be working with VFA-125 to complete squadron-wide F-35C qualifications and on-the-job training for all rates in preparation for their SFFOC early next year. With regard to training aircrew to meet SFFOC, almost half of the transitioning pilots come from an F-35 background, some even having significant experience in the F-35C.

"The Navy and Marine Corps have a rich heritage of deploying together in carrier air wings and VMFA-314's transition to the F-35C furthers this warfighting partnership," said CJSFW Capt. Max McCoy. "The Marine Corps will be critical to deploying fifth-generation capability in Navy carrier strike groups. We're excited to have the Black Knights at NAS Lemoore and look forward to providing the training and support for their Safe-for-Flight Operations Certification as the first Marine Corps F-35C squadron."

CJSFW, headquartered at Lemoore, ensures each F-35C squadron is combat-ready and trained in strike fighter and support missions as required by fleet commanders.

Lt. Cmdr. Lydia E. Bock is the public affairs officer for Commander, Joint Strike Fighter Wing.

E-2D
Launching into the Next Decade

By Rob Perry

When there is a call to battle, it is the first fixed-wing aircraft off the carrier, leading the charge. Once deployed, it is the eyes, ears and brains of the fight, flying high above the battlefield, relaying enemy positions and actions through its advanced radar capabilities, able to keep track of friend and foe. And then, when the mission is over, it is the last fixed-wing aircraft to return, ensuring it maintains surveillance and guaranteeing a safe return for allies.

Some call it the "quarterback of the sky," comparing it to the team leader on the gridiron, calling the plays to the rest of the team.

"The E-2D Advanced Hawkeye is an invaluable asset for the modern fleet as we launch into the next decade," said Capt. Matthew Duffy, commodore, Airborne Command & Control and Logistics Wing.

While iterations of the E-2 have been around for more than 50 years—the first E-2 was developed and launched in the 1950s—the upgraded E-2D now features an APY-9 radar featuring the most modern and technologically upgraded sensor array to allow the aviators in the E-2D to reliably relay strategic information and data to the fleet in real time.

The aircraft was most recently upgraded with aerial refueling (AR) capability as well as software with Delta System and Software Configuration (DSSC) 3. With the AR upgrade, the aircraft can remain on station longer, guiding and leading the strike group, while the DSSC-3 release transmits strategic information via data links to the air wing.

"The E-2D is a game changer," said Capt. Keith Hash, E-2D program manager with the E-2/C-2 Airborne Command & Control Systems Program Office. "The sensors and the technology upgrades we brought to the platform were a two generational leap in technology and capability [compared to the E-2C it replaced]. When it deployed, it provided modern command and control. In fact, it is one of the most modern airborne command and control systems in the world."

The original E-2 was developed in the 1950s and deployed in the 1960s, Hash said. It has gone through many iterations and lifeforms up until the E-2C, which was deployed in the 1970s. From there, it was transformed and updated on a nearly yearly basis until the development of the E-2D, which began in the 1990s and through the 2000s.

The aircraft is controlled by five crewmembers—two pilots and three naval flight officers sitting in a modern cockpit with digital displays and tactical information. The aircrew is able to take vast amounts of data and information being collected by the aircraft's radar and sensor technology and relay it to command and control nodes in order for them to make better decisions in confronting a threat or adversary.

"We modernized the radar and the

U.S. Navy photo by Liz Wolter

An E-2D Advanced Hawkeye, with Air Test and Evaluation Squadron (VX) 20, takes off from USS Gerald R. Ford's (CVN 78) flight deck during aircraft compatibility testing in January.

entire interface, changing how the aviators interact with the weapon system and do their job. The E-2D is a modern aircraft with modern sensors, and we've changed even the philosophy of how it is maintained," Hash said.

"In the past, you would have large pieces of electronics equipment that would come out and require support behind it. The way the E-2D is maintained is at a much more modular level. We've given our operational Sailors the ability to update and change components, which was previously handled at the intermediate-level. This allows us to have better supportability and reliability of the system as it goes forward," Hash said.

Now, with upgrades made to the aircraft to improve radar technology (see page 38) and aerial refueling, the next step is to roll out the upgraded aircraft to the fleet this year.

"In 2020, two fleet squadrons are going to

Acquisition Opportunities for NFOs

U.S. Navy photo

Capt. Keith Hash

Capt. Keith Hash, E-2D program manager of the E-2/C-2 Airborne Command & Control Systems Program Office, has been a part of the E-2 community his entire naval career.

"I've had opportunities to be a part of the E-2D Advanced Hawkeye acquisition from being a test flight officer to logistics, to now the program manager.

"When I was a test flight officer, we were just developing the E-2D on paper. I was part of some of those forums where they were showing us designs and we were saying, 'That's going to work' or 'That's not going to work and we need help here.'"

One of his most rewarding roles was to participate in the design of the intercommunication system (ICS).

"When I was an operational commanding officer (CO) on USS Enterprise (CVN 65) in 2012, the E-2Ds came out with us during one of our underways as a part of the operational tests. We had some of the oldest E-2Cs in the fleet along with the brand new E-2Ds.

"I flew on the E-2D as the CO of the squadron. The first time I touched that communication system was amazing, absolutely eye watering. I will always enjoy my few hours of E-2D time, getting to see the aircraft I helped develop."

Hash has also made it a part of his job to brief the fleet on career opportunities in acquisition.

In addition to competing for training posts or developing and training weapons and tactics, the Navy needs top lieutenants in acquisition to test and inform the designs for future capabilities, he said.

"Acquisition has one of the greatest impacts for future warfighting effects and capabilities to impact our ability to serve our nation. Acquisition is to me, on par with those other key areas for top performers to support our Navy," he said.

Written by Andrea Watters

U.S. Navy photo

Capt. Matthew Duffy

transition to E-2Ds with aerial refueling capability, and that involves air crew training and some aircraft exchanges," Duffy said. "When this deploys, it's going to give the carrier strike group and theater commanders many more options with the employability and the concept of operations with the E-2D."

Duffy said that Jan. 1 marked the start of an important decade for the E-2D, with plans to implement new training approaches, new branding material, as well as new vision and policy statements, all in an effort to reflect the new capabilities of the E-2D. And with this plan rolling out, Duffy said the E-2D will further contribute to fleet readiness.

U.S. Navy photo by MC2 Sean Elliott

An E-2D Advanced Hawkeye assigned to Air Test and Evaluation Squadron (VX) 20 lands aboard USS Gerald R. Ford's (CVN 78) flight deck.

"We've had some challenges in our past, but thanks to the leadership of Vice Adm. [DeWolfe] Miller, the current Air Boss and his staff, Naval Aviation has refocused in a very prudent, methodical way to restore aviation readiness," Duffy said. "Being smart about how we apply leadership and resources, modernizing our processes and approaches will build and sustain readiness. I'm proud to say we've had eight straight months of increasing numbers for mission-capable E-2D Advanced Hawkeyes, ready to be employed by any commander.

"Our best days are yet to come. Our best decade is at our doorstep, and the next decade will be one for the ages, with respect to Naval Aviation, but will be the best decade yet in history of the proud E-2 family."

Rob Perry is a staff writer for Naval Aviation News.

E-2/C-2 Program Office Renamed

The E-2/C-2 Program Office, designated PMA-231, officially changed its name to E-2/C-2 Airborne Command & Control Systems Program Office in October in an effort to better align and serve the E-2/C-2 community.

The name change more accurately reflects the program's mission to develop, acquire and sustain unmatched command and control aircraft so that the warfighter can win the fight today and tomorrow, said Capt. Keith Hash, program manager.

"Our aircraft launches first and lands last," Hash said. "No one goes into the sky without an E-2D or an E-2C up there watching and providing command and control."

The program office received Assistant Secretary of the Navy (Research, Development & Acquisition) James Geurts's approval on Oct. 11 to change the name.

The name change aligns to the current Airborne Command & Control and Logistics Wing (ACCLOGWING) name and the anticipated carrier airborne early warning squadrons name change that took effect Jan. 1, when these squadrons were designated carrier airborne command & control squadrons.

It also reflects the wing commodore's vision for 2020 and beyond.

"Command and control aircraft will never go away or become irrelevant because command and control will always be necessary to see and hear on behalf of our warfighters," Hash said. "This name change sets us up for the future of our program and the wing."

The E-2/C-2 program office supports acquisition and sustainment of the E-2C Hawkeye, E-2D Advanced Hawkeye and C-2A Greyhound aircraft platforms. In 2020, the E-2D is expected to require about 50 percent of the program's attention while the E-2C remains in sustainment and the C-2A continues preparations for sundown in 2024.

Written by Carolyn Smith, who provides communications support for the E-2/C-2 Airborne Command & Control Systems Program Office.

U.S. Navy photo by MC3 Garrett LaBarge

Aviation Electrician's Mate 2nd Class Nathaniel Massey, conducts a phase inspection on an E-2D Hawkeye attached to Carrier Airborne Early Warning Squadron (VAW) 121 in the hangar bay of aboard aircraft carrier USS Abraham Lincoln (CVN 72).

E-2D Sustainment Pilot Program Created

By Shirley Franko

Department of Navy (DoN) leaders established an enduring and disciplined sustainment management process by approving and launching the first Sustainment Program Baseline (SPB) pilot for the E-2D Advanced Hawkeye in fiscal 2020.

While the Navy achieved the Secretary of Defense's mission-capable F/A-18E/F Super Hornet aircraft rate at the end of fiscal 2019, maintaining those readiness levels remains at the forefront.

"We are implementing new processes to bring more rigor into our sustainment efforts, and therefore increasing our output to the fleet," said Sean Burke, Deputy Assistant Secretary of the Navy (Sustainment). "This sustainment pilot will improve the accuracy of our requirements, funding, performance and governance of weapon system sustainment."

Sustainment is the management of everything required to enable future readiness; it reaches back through the enterprise from the flight line, across multiple organizations and disciplines, and consumes more than half of the Navy's budget. To maintain mission-capable rates across the fleet, a highly complex naval sustainment 'system of systems' must manage tens of thousands of parts from thousands of suppliers, truckloads of ever-changing technical data, millions of software lines of code and billions in funding must be aligned, finely tuned and actively managed.

A key component of the pilot process is identifying specific performance requirements for supply, repair, support equipment, engineering, trainers, maintenance and technical data unique for the E-2D that enable fleet squadrons to achieve readiness. The SPB identifies and governs complex interdependencies and refines resource allocation risks across the sustainment system.

Capt. Keith Hash, E-2/C-2 Airborne Command & Control Systems program manager, and Capt. Matthew Duffy, E-2 Wing commodore, have worked closely together to address readiness issues. The E-2D SPB takes their partnership to a new level, with a weapon system focused sustainment document submitted by the fleet commander and the program manager.

"We welcome the SPB and its processes of setting specific comprehensive requirements and regularly measuring performance across the span of product support providers," Duffy said. "This will ultimately generate more readiness and provide additional [full mission capable] Advanced Hawkeyes ready for the high-end fight."

Traditionally, the fleet has reported mission capability, but under SPB, Duffy and Hash will also report quarterly on the performance of the sustainment system to their approved requirements directly to the Vice Chief of Naval Operations, Assistant Secretary Of The Navy Research, Development & Acquisition and Commander, Naval Air Forces.

The DoN anticipates the SPB concept to evolve as they mature and refine the process and expand the use of SPBs. The Marine Corps has developed and submitted their first SPB pilot for the H-1 program.

Shirley Franko is with the Office of the Deputy Assistant Secretary of the Navy (Sustainment).

NAWCAD Lakehurst Expands Additive Manufacturing Facility

By Allison Murawski

Naval Air Warfare Center Aircraft Division (NAWCAD) Lakehurst is supporting Naval Aviation readiness and sustainment through the growth of its advanced manufacturing capabilities, with the recent expansion of its (AM) facility.

The AM team at Lakehurst acquired three new machines for their facility in 2019 to increase production capacity and speed in support of the Naval Air Systems Command (NAVAIR) and the fleet.

"This facility expansion strengthens NAWCAD Lakehurst as a powerhouse in metal-based additive manufacturing," said Kathleen P. Donnelly, NAWCAD Lakehurst executive director. "Our team is at the tip of the spear in using emerging technologies to increase readiness and sustainment for our Sailors and Marines, and it's exciting to see how they continue to revolutionize navy manufacturing."

NAVAIR is exploring the use of AM to create aviation parts and tools that would not be possible through traditional manufacturing techniques and to sustain parts that are no longer available in the supply system.

AM, commonly known as 3D printing, is the process of joining materials such as polymers and powdered metals, layer upon layer, to make objects from 3D model data inside a machine using a laser or electron beam. It can decrease manufacturing time from weeks or days to hours and be used on complex geometries that cannot be built using traditional manufacturing methods, said NAWCAD Lakehurst Advanced Manufacturing Technology lead Kyle Cobb.

NAWCAD Lakehurst opened its unique metal-based AM facility in 2015 with a metallic Laser Powder Bed Fusion (LPBF) system and a team of four people. The team was a part of NAVAIR's successful flight of the first safety-critical AM part in July 2016 on an MV-22B Osprey.

The Lakehurst team has now grown to more than 20 engineers and produced more than 76 AM builds totaling more than 250 parts to evaluate the use of metal-based additive manufacturing to address warfighter needs.

"It's a paradigm shift in how we do business, because it removes the traditional boundaries we have when we're thinking about designs," Cobb said. "Now you're enabled to effectively generate your design based on the actual requirements versus your ability to make the item. AM opens up a whole new world of opportunity."

The three new machines include an Optomec CS-800 Directed Energy Deposition (DED) AM System, Sciaky Electron Beam AM (EBAM) System and the NSI X5000 Computed Tomography (CT) NDI X-Ray System.

The DED AM system allows the team to repair larger items with complex geometries that previously would have been salvaged or scrapped, including critical engine components that are expensive to replace.

The Electron Beam system can repair large objects in a timely fashion with little waste. It uses a wire-feed system with an electron beam to lay materials with a much higher rate of deposition, saving time and money.

The CT X-Ray system expands the AM facility's reverse engineering capabilities and enables engineering investigations and failure analysis without disassembling components and losing valuable information.

U.S. Navy photo

Engineers conduct Bead on Plate trials on the Optomec CS-800 DED System at NAWCAD Lakehurst.

U.S. Navy photo

Engineers with the Advanced Manufacturing/ Prototype Engineering Branch at NAWCAD Lakehurst use the Sciaky EBAM System to fixture a part.

"Often times we don't have the data rights to legacy components that were designed 30-40 years ago," Cobb said. "As we continue to extend the life expectancy of each platform, we need to support more and more parts. This machine will allow us to capture the internal and external geometry so we can perform reverse engineering, which often feeds the additive process."

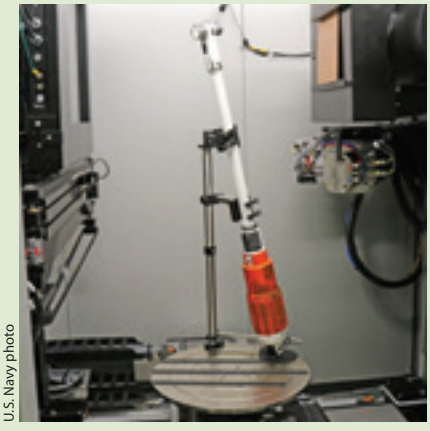
The system also brings scanning services in-house, reducing contracting and shipping costs.

"These three systems will result in a tremendous increase in capability and will have an immediate impact to the warfighter," he said. "We're working so hard and so fast that you don't really notice all the evolution and the progress we've made, but when you take a step back and realize we've just gained this amount of equipment in this amount of time and trained all these people, I think it's really impressive."

Allison Murawski is the public affairs officer for Naval Air Warfare Center Aircraft Division Lakehurst.

U.S. Navy photo

An engineer at NAWCAD Lakehurst operates the controls of the Optomec CS-800 DED System.



U.S. Navy photo

The Repeatable Release Holdback Bar (RRHB) fixtured in the NSI X5000 CT X-Ray System.

OLD BIRD Teaches Test Pilots New Tricks

Story and Photography by Paul Lagasse

Over the course of their 11-month program, students at the U.S. Naval Test Pilot School (USNTPS) at Naval Air Station (NAS) Patuxent River, Maryland, have the unparalleled opportunity to fly a wide array of aircraft—from the latest strike fighters to the oldest airplane in the Navy's inventory.

But for many students, one of their most memorable flight experiences is fly "Panchito," a World War II-vintage B-25J Mitchell medium bomber, courtesy of the Delaware Aviation Museum.

For 16 years, Larry Kelley, Panchito's owner and the museum's executive director, has been visiting Patuxent River twice a year to allow test pilot school students to take turns flying the aircraft in a variety of configurations. Kelley said that Panchito allows students to grapple with handling characteristics that are dramatically different from other types of aircraft.

"There are no boosted controls, no nose-wheel steering and no computers," Kelley said. "This is all what's called 'arm-strong' flying. However strong your arms are is all the boost you've got."

Lt. Col. Rory "Pikey" Feely, USNTPS Commanding Officer, explained that Panchito is part of the USNTPS Qualitative Evaluation (QE) program, through which USNTPS contracts with a number of aircraft operators as a way to broaden the experience of test aviators and flight-test engineers.

"Aircraft in the QE program are chosen for their ability to reinforce key learning objectives being taught in the curriculum," Feely said. "The QE program also supports the staff instructors because an aviation engineering mindset needs continuous fostering over a career. Hence, USNTPS encourages staff participation in as many QE flights as possible."

The benefit of spending several hours in the cramped flight deck of the bomber, relying on analog "steam gauges" instead of the latest all-digital, fly-by-wire cockpits, is that students get a unique opportunity to test their adaptability.

"The aviators who come in here do not spend their entire career flying one particular type of airplane," said Kelley, one of three pilots approved to fly Panchito as part of the QE program. "They're leaving here to go into a test environment. For a test pilot, adaptability becomes very important."

In Panchito, which the students have nicknamed "PB&J," students not only practice takeoffs, landings, cruising flight

Smoke belches from one of "Panchito's" radial piston engines during a warm-up prior to a flight at the USNTPS.

and turns; they can also try other maneuvers in the test program such as stalls, Dutch rolls, sideslips, spirals and phugoid oscillations.

"It's very difficult for someone to do anything that they've only heard described and never seen," Kelley explained. "So on that first landing, we're dance partners on the controls. You need a partner who's going to take the lead. When I was learning swing dance, it was that way. You get a dance partner who is a professional, who knows the dance, and they take the lead, and then—bam—all of a sudden, you can nail it."

As a bonus, the flight is a memorable experience for the pilots and engineers. Kelley always reminds students that they are stepping into the shoes of many young B-25 crews who routinely left an envelope on their bunk to mail home in case they didn't make it back from a mission.

The Delaware Aviation Museum has been running a B-25 pilot-in-command and second-in-command training program for five years. The course includes ground school as well as on-the-ground and in-flight instruction in the aircraft. Dozens of pilots have gone through the course, but Kelley said that test pilots are in a class by themselves.

"What separates this level of professionalism from, say, an amateur general aviation pilot is that the next time they fly the airplane, they can generally replicate their experience," Kelley said. "And that's part of what this school is all about—getting these pilots to the level to where they can take that brief and translate it into a flight and get the data the engineers need."

"I'm just in awe of what these guys and gals do," he said.

Although Kelley has been flying for just over 50 years—22 of them in Panchito—mastering the B-25 was a struggle for him. In contrast, the best natural B-25 pilot he's ever seen was a USNTPS student who handled the airplane like a veteran from the moment she first strapped into the left-hand seat.

Lt. Brad Tribley, left, gets a briefing on the controls of "Panchito" from Delaware Aviation Museum pilot Calvin Peacock prior to a training flight at the U.S. Naval Test Pilot School (USNTPS).

Larry Kelley, Panchito's owner and co-founder of the Delaware Aviation Museum, stands in front of his B-25 Mitchell at the USNTPS.

Marine Corps Maj. Hugh Anderson, a student at the USNTPS, looks out of the pilot's seat of Panchito after returning from a test flight to assess the airplane's handling characteristics.

"She was so short we had to put cushions behind her to be able to reach the rudder pedals," Kelley recalled. "From the moment we left the chocks, though, it was like she had grown up in the airplane."

"Her call sign was 'Duke,' because they said she walked like John Wayne," Kelley added.

Following her graduation from USNTPS, "Duke"—Marine Corps Lt. Col. Nicole Aunapu Mann–went on to serve as an F/A-18 test pilot in Air Test and Evaluation Squadron (VX) 23 before being selected as one of eight members of Astronaut Group 21 in 2013. Today, Mann is currently training to be on the first crewed flight of the Boeing CST-100 Starliner to the International Space Station next year.

"The pilots who have made it to this level in their career, it's not happenstance that they're selected for this school," Kelley said. "Their adaptability is faster. Things go wrong in test programs, so you've got to make certain that you have the best of the best."

Paul Lagasse is a communications specialist with Naval Air Warfare Center.

F-35 RAPID RESPONSE TEAM
Takes Repairs on Road

By Heather Wilburn

When issues arise with an F-35 Lightning II, the F-35 Rapid Response Team (RRT) stands ready to get the jet back in the fight.

"Anything that happens outside the depot—for the Navy, Marines or Air Force—anywhere around the world, they call us and we can deploy these RRT team members at a moment's notice," said David Thorpe, F-35 branch head at Fleet Readiness Center East (FRCE) where the team is headquartered.


U.S. Navy photo

The RRT consists of expert, cross-trained artisans who hold journey-level, expert status in at least one trade, and a skilled worker-level status in others, Thorpe said.

"The team is like a maintenance and repair special operations force," he said. "The concept is that we can send fewer people and they can help each other do the work."

For example, a recent RRT mission to Edwards Air Force Base, California, called for a dedicated low observable (LO) coating technician and a painter plus the removal of a large panel not designed for removal under normal maintenance action, Thorpe said.

The repair involved a Navy Test and Evaluation Squadron (VX) 9, DET Edwards, aircraft and the team's performance impressed leadership at the DET, said Lt. David Quant, the unit's maintenance officer.

"Our squadron has worked with numerous contractor and depot-level teams and the F-35 RRT left a very positive and lasting impression. It was obvious to us that the RRT was a group of hand-selected individuals who possessed the right level of experience and motivation," he said. "The team even went above their scope by assisting our Sailors with regression checks and the installation of panels."

Not only did the RRT get the job done, they managed to do it within their planned time frame—an especially big win for a repair that had yet to be performed. And while this aircraft was not a forward-deployed asset—like the majority of the aircraft repaired by the RRT—meeting that repair schedule on a test aircraft is important to help the Navy realize Initial Operational Capability and system demonstration and development dates, Thorpe said.


U.S. Navy photo by Heather Wilburn

The F-35 Rapid Response Team is a highly skilled team of cross-trained aircraft maintenance professionals headquartered at Fleet Readiness Center East.

VX-20 REPORT

SPECIAL SECTION: *AIR TEST & EVALUATION SQUADRON (VX) 20*

Air Test and Evaluation Squadron (VX) 20 executes developmental flight test for Navy and Marine Corps fleet programs including the E-2C/D Hawkeye, P-8A Poseidon, MQ-4C Triton, E-6B Mercury, C-2A Greyhound, KC-130T/J Hercules, T-6A Texan II and their associated airborne systems.

From aerial refueling to airborne navigation, communication and surveillance, the "Force" supports test across all phases of the system life cycle advancing capabilities and operational readiness for Naval Aviation.

—Cmdr. Matthew "Cupcake" Tharp, Commanding Officer

A VX-20 P-8A Poseidon prepares to release an ATM-84A-1C Harpoon missile over the Chesapeake Bay.

U.S. Navy photo by Liz Wolter

US Navy photo by Liz Wolter

P-8A SAR Capabilities Expanded

By Squadron Leader Nathan "Butters" Mula, Royal Australian Air Force

A P-8A Poseidon from VX-20 successfully drops and deploys SAR kits into the Chesapeake Bay in summer 2019.

Advanced sensors designed to find small objects on the ocean surface, a large internal weapon bay and the legs to reach the far corners of the planet help contribute to the success of the P-8A Poseidon aircraft as a premier anti-submarine and surveillance aircraft. They also make it an ideal search-and-rescue (SAR) platform.

During summer 2019, VX-20 conducted the final series of developmental test drops of the new UNIPAC III SAR Kit. In this latest phase, P-8A deployed 12 kits over two weeks of flying. Testing included the full timeline from loading onto the aircraft, launching the kit from a P-8A and having "survivors" in the water operating the raft and equipment

The UNIPAC III is a complete redesign of the already fielding UNIPAC II SAR Kit, bringing the total number of survivors a single P-8A can save up from 16 to more than 100. The kit includes a 20-plus man life raft and survival stores including emergency food and water rations, first aid kit, survival blankets and beacons. The store deploys with a 675-foot floating line that can assist a survivor in getting to the life raft in poor weather conditions.

Flying in at 500 feet and 225 knots, the P-8A dropped the kits into the Chesapeake Bay where a team of engineers, safety personnel and survivors were ready and waiting to jump in. The survivors were comprised of volunteers from VX-20 and P-8A's integrated test team and included aircrew, engineers, project management staff and other supporting personnel.

Survivors were assessed on their ability to use the life raft, including flipping an overturned raft and the survival equipment with little to no training prior. VX-1 rescue swimmers were on hand to provide assistance, however, all of the survivors were able to board the raft and continue testing.

The UNIPAC has gained attention with its most recent assist helping Patrol Squadron (VP) 45 locate a missing mariner in Guam.

The UNIPAC III SAR Kit is a joint program between the U.S. Navy and the Royal Australian Air Force (RAAF) operating under the cooperative partnership between the two countries. RAAF plans to conduct follow-on operational testing using P-8As based in Adelaide, Australia, in 2020.

U.S. Navy photo by Adam Skoczylas

Squadron Leader Nathan "Butters" Mula poses in front of a P-8A Poseidon.

US Navy photo by Liz Wolter

A VX-20 P-8A Poseidon releases a High Altitude Anti-Submarine Warfare Weapon Capability for integration testing over the Atlantic Ocean.

Ushering in P-8A High Altitude ASW Lethality

By Lt. Ryan "Randy" Miller, P-8 HAAWC Project Officer

"Splash" is the last sound an enemy submarine wants to hear while on patrol.

With the successful flight test and integration evaluations now completed for the High Altitude Anti-Submarine Warfare Weapons Capability (HAAWC), this sound can now be delivered unexpectedly and precisely from any P-8A Poseidon aircraft far above the clouds.

In May 2019, VX-20 conducted flight test operations at Pacific Missile Range Facility (PMRF) to collect flight data from the P-8A weapon system to validate and verify system and subsystem requirements, evaluate HAAWC free flight performance and the P-8A to HAAWC operator machine interface (OMI).

The flight tests consisted of five free-flight weapons releases, four of which were MK-54 Ballistic Air Test Vehicles evaluating HAAWC delivery performance and one end-to-end evaluation using a MK-54 Exercise Torpedo (EXTORP) delivery against a live MK-30 subsurface target.

"The integrated test free flight launches were very successful. After completing safe separation and captive carriage testing, it was amazing to see everything come together in a mission scenario and watch the crew successfully employ an EXTORP against a target from high altitude," said Adam Domke, P-8A Integrated Test Team (ITT) HAAWC project engineer.

US Navy photo

HAAWC with wings open after drop.

"The HAAWC is designed to provide a standoff anti-submarine warfare (ASW) capability and enable MK-54 torpedo employment throughout the P-8A operational flight envelope. Throughout the entirety of the Developmental Test period, we were able to discover and help fix issues that will help make this new weapon capability more usable and deadly when delivered to the fleet," Domke said.

The flight test team consisted of an integrated team of VX-20 and VX-1 aircrew.

"I have no doubt that the operational test team is ready to continue the push to get this capability to the fleet," said Lt. Ryan Miller, the P-8A ITT HAAWC project officer. "The VX-1 aircrew and aviation ordnance teams were able to participate and observe everything from weapons loading, pre-flight inspection and weapon delivery during the test period."

VX-1 plans to execute the final test period for HAAWC before fleet delivery.

"We are excited," said Lt. Matt Hutson, a qualified P-8A Tactical Coordinator. "This new capability supports our primary mission, ASW, and I am excited to see what tactics are developed and how the fleet intends to employ its new tool. If I were an enemy submarine, I would be shaking in my ballasts."

E-2D Hawkeye Achieves Aerial Refueling

By Lt. David "Sling Blade" Chapelle

The Navy's premier carrier-based airborne early warning platform has joined a long list of military aircraft capable of refueling in flight.

US Navy photo by Erik Hildebrandt

A VX-20 E-2D Advanced Hawkeye evaluates aerial refueling with an F/A-18F Super Hornet.

US Navy photo by Liz Wolter

A VX-20 E-2D conducts aerial refueling evaluations with an Air Force KC-10 tanker over the Chesapeake Bay.

Initial risk reduction evaluations were conducted in 2010 and 2011 to determine the E-2D Advanced Hawkeye's suitability for performing such a task. After developing a flight controls upgrade, a new pilot seat and incorporating fuel system modifications, the first aerial refueling (AR) capable E-2D performed its first flight on Dec. 15, 2016, in St. Augustine, Florida.

VX-20, in conjunction with Northrup Grumman Corporation, conducted initial system evaluations in 2016 and began initial refueling testing in 2017. Over the next three years, VX-20 conducted testing with a plethora of tankers in the airspace surrounding Naval Air Station Patuxent River, Maryland.

The E-2D has since been qualified to refuel with KC-10 Extender, KC-135 Stratotanker and Omega KC-707 tankers as a probe/drogue receiver. Refueling developmental test has also been completed with the F/A-18 E/F and KC-130 Hercules tankers.

Hawkeye fleet operators began receiving training to perform the refueling task in October 2018 and the first AR modified E-2D was delivered to the E-2 fleet replacement squadron, Carrier Airborne Early Warning Squadron (VAW) 120 in September 2019.

The first operational squadron will begin transitioning in 2020 and eventually all fleet E-2Ds will be capable of performing AR. The new capability will extend the Hawkeye's operational range and endurance, providing warfare commanders with sustained global picture of the battle space. Future development of the capability will include qualification on additional U.S. and NATO tankers as well as enhancing flight controls and system performance.

E-2D Communications Upgraded

By Lt. Anup "Big P" Engineer

Delta System Software Configuration (DSSC)-3.1 is an incremental upgrade to the E-2D.

Major upgrades include the Avionics Flight Management Computer and the Mission Computer Display software as well as MIDS JTRS CMN-4 terminal, NAVWAR GPS antenna and Hybrid-Beyond Line of Site (H-BLOS) hardware. Software upgrades to the ENTRS TRS, GPS Y-Code and the Naval Integrated Fire Control–From the Air systems are also underway.

The MIDS Low Volume Terminal currently in the E-2D will be replaced by the MIDS JTRS CMN-4 terminal, which is a software defined radio that will bring frequency remapping and cryptographic modernization capabilities to the system. These new features will enable conformity to the modernized cryptographic standard and create a more efficient transfer and receipt of data over the network, increasing throughput for current and future capabilities.

H-BLOS will provide a connection to Secure

U.S. Navy photo by Adam Skoczylas

Lt. Anup "Big P" Engineer and Lt. David "Sling Blade" Chapelle pose next to the props of one of VX-20's E-2Ds.

US Navy photo by Liz Wolter

A VX-20 E-2D conducts an aerial refueling test flight.

Protocol Router Network (SIPRNET) via the satellite internet-based INMARSAT. This capability will allow the E-2D to connect to chat rooms within an area of responsibility and have direct chat communications with surface ships in carrier strike groups and combatant commands. Access to real-time tactical information will enhance situational awareness of E-2D aircrew and facilitate efficient command and control tasks.

The NAVWAR system includes a new Advanced Digital Antenna Production Controlled Reception Pattern Antenna and associated electronics that will replace the current GPS antenna. Additionally, the NAVWAR package will include an AFMC software upgrade. The primary purpose of the system is to reduce the effects of GPS interference, and is designed to allow the E-2D to operate in areas where signal disruption would prohibit unprotected GPS reception.

By the first quarter of 2020, VX-20 will have two E-2D aircraft in a DSSC-3.1 configuration. Testing will be conducted through laboratory, ground and flight test.

MIDS JTRS CMN-4 test points of interest include modernized cryptographic key loading, concurrent contention reception of J-series messages, Link-16 track reporting, time slot reallocation maximum capacity and high power amplifier performance characterization.

H-BLOS test points of interest include network connectivity characterization, network reliability characterization, uplink/downlink speed tests, HMI usability, browsing performance and chat functionality. NAVWAR test points of interest include GPS antenna pattern data collection (voltage standing wave ratio, RF transmission line loss, and RF power output measurements).

DSSC-3 will be tested at VX-20 in conjunction with VX-1 as a Developmental Test Assist in 2020. Fleet release is expected in July 2020.

Data Link Upgrades

By Lt. Anup "Big P" Engineer

MIDS JTRS along with Tactical Targeting Network Technology (TTNT) will bring the first IP-based line-of-sight (LOS) datalink to the E-2D and is part of the Delta System Software configuration (DSSC)-4 upgrade for the E-2D mission system.

US Navy photo by Liz Wolter

U.S. Navy E-2D Advanced Hawkeye, of VX-20 conducts a flight off the coast of Saint Augustine, Fla.

This new system will allow the E-2D to communicate with the EA-18G and eventually the F/A-18E/F over a high-speed data-link, significantly increasing data-sharing capabilities within a Carrier Air Wing. Additionally, TTNT will enable the E-2D to communicate though military chat systems across the world.

By mid-2020, three VX-20 E-2D aircraft will be configured with TTNT to conduct test flights. Testing will be conducted through laboratory, ground and flight test and will focus on the chat and sensor netting applications. Tests points will include maximum data throughput, maximum range, waveform verification, concurrent link operation evaluation, data relaying, latency and connectivity evaluations. After VX-20 completes the developmental test effort, the system will be operationally tested by VX-1 and then released to the fleet (tentatively in 2022) as part of the DSSC-4 upgrade. TTNT capabilities will continue to be upgraded in future DSSC builds.

US Navy photo by Erik Hildebrandt

A VX-20 E-6B conducts flutter testing.

'The mighty TACAMO' Testing Begins

By Lt. Carl Steffer, Project Officer E-6B

The first E-6B Mercury Block II modified aircraft is undergoing Developmental Testing (DT) for the Take-Charge-and-Move-Out (TACAMO) and Airborne Command Post missions.

The aircraft, with its very low frequency dual trailing wire antennas, accomplishes the TACAMO mission by receiving and relaying emergency action messages from the National Command Authority to U.S. strategic forces, which include ballistic missile submarines, strategic bombers, and intercontinental ballistic missile (ICBM) facilities.

The ABNCP mission adds the capability and responsibility of directly launching land-based ICBMs with the Airborne Launch Control System (ALCS), managed and directed by United States Strategic Command Battlestaff members. The aircrew and aircraft stand alert 24/7 to support the nation's nuclear command, control and communications capability.

The Block II modifications improve the effectiveness and efficiency of accomplishing the E-6B's strategic missions through a multitude of software and hardware upgrades. This includes replacing the aging mission crew voice system with a digital voice system and replacing the Military Strategic and Tactical Relay Terminal with the Advanced Extremely High Frequency Family of Advanced Beyond the Line of Sight Terminal.

Initial ground testing, electromagnetic pulse and electromagnetic environment effects testing were completed in summer 2019. Additional equipment modifications, telecommunications electronics material protected from emanating spurious transmissions testing and further mission systems DT will continue until the aircraft is ready for Operational Testing.

US Navy photo by Erik Hildebrandt

A second angle on a VX-20 E-6B conducting flutter testing.

Triton Test Team Preps for Major Upgrade

By Lt. Chris Sheehan, Project Officer, MQ-4C

One of VX-20's MQ-4C Tritons is parked outside the hanger before a test flight.

US Navy photo by Liz Wolter

Tucked away in the far corner of Naval Air Station Patuxent River, Maryland, the MQ-4C Triton Unmanned Air System hangar houses more than 200 highly experienced professionals charged with testing both a brand new aircraft in the Naval Aviation inventory, and a game changing addition to the maritime patrol and reconnaissance mission.

The MQ-4C Triton is a high altitude, long endurance, large unmanned aircraft system (UAS) based on the Air Force's Global Hawk, but with a number of system and airframe upgrades to meet the unique requirements of its naval mission. Triton is designed to travel a long distance and remain on station for many hours, all the while being controlled from halfway around the world.

Integrating even the normal operations of a UAS of this size into the extremely busy airspace of Patuxent River would be difficult, but throw in high risk test maneuvers and safe completion of a flight takes the focused effort of an entire team.

U.S. Navy photo by Adam Skoczylas

Lt. Chris Sheehan is the project officer for the MQ-4C Triton program.

Recent air vehicle testing has included high crosswind/heavy gross weight landings, allowing the fleet to increase their take-off and landing crosswind limits, as well as a carefully planned and executed flutter program that increased flight control freeplay limits, which will result in quicker production of new airframes.

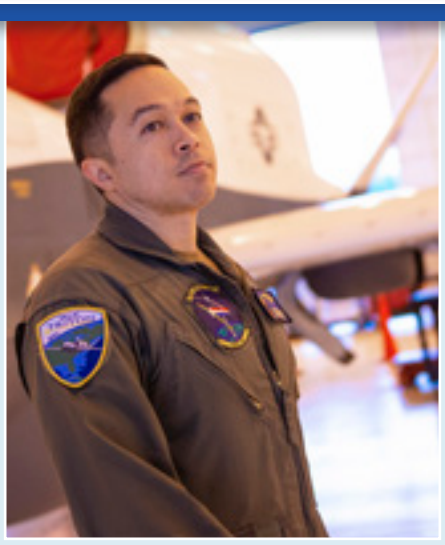
United States Naval Test Pilot School graduates were at the controls for the test flight related to these two efforts. The sensory feedback these pilots would get from sitting in the cockpit of a manned aircraft is now reduced to the data displayed on their computer screens in a building on the other side of the base.

When they ask themselves "does this look right, does this feel right?" they need the help of a wide ranging test team to be able to confidently answer. Airborne or ground chase offers reassuring actual eyes on the aircraft. Dedicated government and civilian engineers construct test points and monitor progress through telemetry or system feedback. Maintenance installs and monitors new component and aircraft health monitoring equipment. Even air traffic control is crucial with their coordination and confirmation of clear airspace.

Though the airspace might be busy, the Patuxent River Operating Area offers the perfect laboratory for the development and improvement of the on-board sensors. The Triton test team is staffed with skilled enlisted and commissioned operators

from the P-3 Orion, EP-3 Aries and P-8 Poseidon communities who bring a wealth of recent on-station experience to ensure these new systems can seamlessly meet the worldwide demand for multi-domain airborne intelligence.

While these experts continue to test and improve the current systems on board Triton, work is already underway to prepare for near-future upgrades that will enhance fleet capabilities, such as radar and network improvements. The largest change on the horizon is the transition to Triton Multi-Int, which will be a nose-to-tail aircraft upgrade that will dramatically increase the on-station capabilities of the aircraft, and will require the full spectrum of meticulous test and evaluation once the aircraft arrives on the VX-20 flight line. The dedicated Triton Integrated Test Team is ready for the challenge.



U.S. Navy photo by Adam Skoczylas

Petty Officer First Class (AWO1) Lanze A. Edralin Jr. stands in front of the parked MQ-4C Triton. He's one of the many aircrew testing the aircraft's capabilities.

C/KC-130: Navy, Marine Corps and Coast Guard Workhorse

By Lt. Cmdr. Kurt Pfeffer, U.S. Coast Guard

The VX-20 C-130 Hercules team operates the only aerial refueling support organic to the Naval Air Systems Command.

Three KC-130T aircraft are configured exclusively for the refueling mission and rely on experienced aircrews to perform day-to-day missions. Each tanker is outfitted with an additional 23,000-pound fuel tank inside the cargo compartment. This provides support for a variety of developmental test aircraft with up to as much as 850,000 gallons per year.

The same C-130 team includes only two active duty Marine Corps test pilots and one Coast Guard pilot to support all Marine and Navy developmental test efforts. Recent projects have included live fire events of the Harvest Hercules Airborne Weapons Kit (HAWK) Plus that integrated Hellfire and Griffin munitions, integration of an electronic

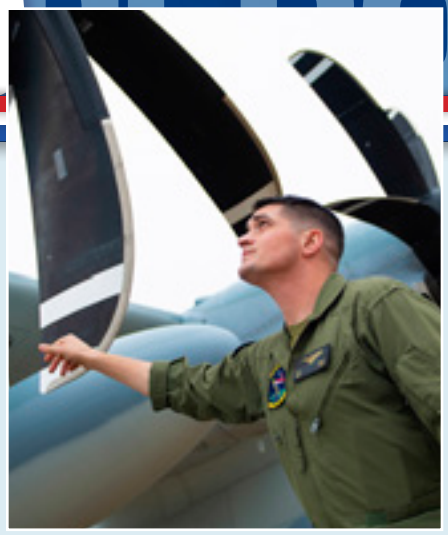
US Navy photo by Liz Wolter

A KC-130 and E-2D from VX-20 conduct a refueling developmental test at NAS Patuxent River.

warfare capability on a KC-130J, and a complete avionics upgrade program on the legacy C-130T.

Additionally, working directly with the Coast Guard, the team was involved in integration of an electro optical/infrared sensor on the C-27J aircraft.

Each mission the C-130 Hercules team performed required extensive planning and coordination by the team of diligent, professional test engineers and a scheduler.



Major Nate Houle conducts a preflight inspection on a KC-130J.

Lt. Carl Steffer stands in front of the KC-130T

U.S. Navy photos by Adam Skoczylas

C-38 Team Test Supports Evolving Technology

By Eric "Snot" Werking, P-8 ITT Deputy Government Flight Test Director/C-38 Platform Coordinator

Acquired from the Air National Guard (ANG) in 2015, VX-20's two C-38 Courier initially served as safety chase aircraft for the P-8A Poseidon developmental test program, replacing the three venerable but increasingly difficult to maintain T-2C Buckeyes that had served in that role since 2009.

The C-38 is a militarized version of the AstraJet/Gulfstream 100. Despite its limited maneuverability, the C-38's high speed and long endurance made it well suited as a chase aircraft for test events lasting three to four hours. In comparison, the T-2s required multiple hot refueling iterations over the course of one test flight.

The C-38 also supported the E-2 program, first as a safety chase during inflight refueling testing, and later as a radar target during tracking improvement evaluations where its endurance again proved to be an asset. It also served as a target during a multi-day large force exercise where it performed some weather reconnaissance as well.

A C-38 with its new paint scheme conducts a chase flight from NAS Patuxent River

U.S. Navy photo

This past year was a significant year for the C-38 program. First, both aircraft were equipped with Automatic Dependent Surveillance-Broadcast compliant transponders, which not only allowed them to meet the FAA 2020 deadline for that capability, but also enabled them to participate in live, virtual, and constructive test events.

Second, one jet was equipped with a trailing cone system, enabling it to act as a pacer aircraft and support the calibration of the air data systems of other aircraft. This is a new capability for the Naval Air Warfare Center Aircraft Division that will benefit multiple platforms.

Third, the Rapid Prototyping, Engineering, and Demonstration Group has invested in the aircraft with the goal of transforming them into flying laboratories. Surveys of the aircrafts' electrical system are underway to determine the capacity to power additional test equipment and external modifications are being considered to support the carriage of podded systems.

Lastly, a new paint scheme was developed, replacing the overall white ANG scheme the jets have worn since their arrival. The new, eye-catching paint job features a red and blue stripe, matching the VX-20 patch, running from nose to tail over a base coat of Navy gray. Their new look is a good match for their new roles as test beds for evolving technology.

U.S. Navy photo by Paul Lagasse

A C-12U Huron on the tarmac at NAS Patuxent River.

C-12U Huron Provides Safe, Reliable Testing Capabilities

By Lt. Adam Bergman

Of the many aircraft in VX-20's inventory, a small but highly versatile and reliable aircraft quietly stands out as a squadron workhorse.

The UC-12M Huron is a civilian Beechcraft King Air 200 derivative containing two 750 Shaft Horse Power Pratt & Whitney PT6A-42 engines and a Pro-Line 21 glass cockpit. It has an approximate range of 1,200 nautical miles, a cruising speed of 250 Knots True Air Speed, and a service ceiling of 35,000 feet.

VX-20 Integrated Test Team primarily uses the aircraft for weather reconnaissance, airborne chase and pilot proficiency.

Due to the aircraft's simple design, it successfully supports VX-20's flight test missions at a very low cost. Nearly all VX-20 pilots complete advanced multi-engine flight training in a King Air aircraft, reducing the number of pilot training sorties required for designation as a Transport Plane Commander.

Additionally, many businesses use the civilian King Air 200 for company support, which contributes to a readily available aircraft parts supply. This minimizes the time required to receive spare parts and reduces lost sorties, which makes the Huron a "go to" platform for flight test or light utility support.

In recent missions, the aircraft has primarily provided weather reconnaissance and chase support for the MQ-4C Triton Unmanned Aircraft System. The Huron is the ideal aircraft for this mission with its approximate five-hour endurance, high altitude and all weather capability. It's low stall speed envelope above 20,000 feet adds additional success as an ideal chase for a high lift over drag glider-style UAS. Furthermore, it contains one ultra-high frequency radio and two very high frequency radios enabling each Huron pilot to monitor Air Traffic Control and telemetry communications and the test aircraft simultaneously. Its Pro-line 21 avionics suite provides high situational awareness and work-load reduction for pilots.

As a light utility aircraft, the Huron can transport up to eight passengers approximately 1,000 nautical miles in approximately 3.5 hours. Through the cargo door, a large pallet can be loaded after removing the passenger seats. Previous transport missions have included CH-53 tail-rotor delivery and aircrew drop offs to off-sight flight test locations.

Overall, the UC-12M Huron enables VX-20 to conduct and support flight test missions in a safe, reliable and low cost aircraft.

U.S. Navy photo by Adam Skoczylas

Lt. Adam Bergman is one of the C-12 instructors.

New Capacity Model to

By Kaitlin Wicker

Fleet Readiness Center (FRC) commanding officers (CO) are using the Capacity Model to better forecast and increase maintenance throughput without sacrificing safety or quality.

U.S. Navy photo by P01 Allen Nauss

Aviation Machinist's Mate (AD) 2nd class Gurley conducts a pre-induction inspection on a C-130T T56-A-16 engine that was delivered to the FRCMA Det New Orleans engine shop.

The Capacity Model, one thread of the Sustainment Vision 2020 (SV2020) initiative, enables stakeholders to view the workload capacity of each FRC as well as the entire Naval Aviation sustainment system. For the first time, the model allows for "what-if" analysis of workload across the sites to optimize repair solutions and use of resources, including equipment, facilities and personnel.

SV2020 aligns existing readiness recovery efforts throughout the Naval Aviation Enterprise (NAE) with new solutions to ensure the enterprise is approaching readiness recovery holistically. The Capacity Model is an integral piece of this, according to Capt. Chris Couch, FRC Mid-Atlantic (FRCMA) CO.

"What surprised me the most was how well the component production processes were captured," Couch said. "The model was accurate in forecasting component production rates."

FRCMA is the first site where all of the workload data was collected and entered into the model.

The Capacity Model uses different types of data, depending on the type of site. For depot-level sites, historical production data is input to the model. This refers to all of the data that is available that tells the story about items being produced within the FRC. Router data is used to run the model for intermediate-level sites. Maintenance router data is the data that tells the artisan where to route the workload for the next task. Both can be run through an algorithm to produce a real-time analysis of where the site is experiencing constraints. These results allow leadership to not only make accurate decisions regarding equipment, facilities and personnel, but also allows them to see exactly what they can and cannot handle.

For example, if the planned capacity is based on specific equipment being in working order and a determined number of dedicated artisans, but the equipment is down or workforce challenges exist, the model can quickly incorporate the constraint and resources can be re-allocated before throughput is negatively affected.

Historically, the depots relied on trends from past years to predict workload, which assumes that needs will be the same each year, leaving sites with outdated and inaccurate forecasting information. The Capacity Model provides predictions in "real-time" allowing for meaningful and actionable results.

These modeling efforts at FRCMA identified several work centers with both over and under-utilized equipment and/or personnel. Recommendations of shifting personnel with similar qualifications from day/night shift and from work center to work center garnished an increase in production of a thousand or more components. Other non-material

Improve Production

U.S. Navy photo

AD2 Savannah Abendroth, AD3 Austin Kubiak and ADAN Joshua Krukowski are building up a T-700 Turboshaft engine for use in H-60 helicopters.

"The introduction of the capacity model is a game changer. It provides the NAE with global visibility of depot capacity to include the ability to perform 'what-if' analysis for organic repair."

U.S. Navy photo by PO1 Brandon Cole

AS3 Alicia Dalton from FRCMA Detachment Norfolk performs electrical troubleshooting on the A/S-48M-108 Mobile Electric Power Plant.

U.S. Navy photo by PO1 Brandon Cole

AD3 Danya Porter and AD3 Tyler Mitchell move an overhauled T-56-A turbo prop engine for an operational check on the test cell.

solutions that provided process improvements included increased qualifications for maintainers and artisans, adjusted logging of workload to increase efficiency, and documenting equipment usage . Modeling efforts also provided material solution recommendations such as the addition of equipment for specific work centers.

"The introduction of the capacity model is a game changer. It provides the NAE with global visibility of depot capacity to include the ability to perform 'what-if' analysis for organic repair," said Rich Bomhold, SV2020 director.

Couch expects the model to have a significant impact on the way business is done at the FRCs.

"For the first time, it accurately captured the constraints, production flow rates and logistics element resourcing for our component production process," he said. "This allows us to allocate resources where they will have the most impact."

This is all part of Commander, Fleet Readiness Centers push to find technologically relevant and efficient ways to allow the enterprise to operate smarter, not harder. To date the Capability and Capacity team has gathered data for shops at four of the FRCs: FRC West, FRC Southwest, FRC Southeast and FRCMA. The team is also modeling the Marine Aviation Logistics Squadron.

Kaitlin Wicker is a communication specialist supporting Sustainment Vision 2020.

Logistics Specialist (LS) 1st Class Manny De Jesus takes inventory of supplies aboard guided-missile destroyer USS Dewey (DDG 105).

LS Seaman Recruit Ramel Quattlebaum does inventory in supply support aboard Arleigh Burke-class guided-missile destroyer USS Carney (DDG 64).

New Operating Model Transforms Supply

By Jenae Jackson

NAVSUP Weapon Systems Support (NAVSUP WSS) has aligned and modernized core business practices and introduced a new Operating Model (Op Model) to evolve supply support to the fleet.

Three integrated weapon systems teams (IWSTs) piloted the initial Op Model concept in early 2019, and in April it was established across all aviation and maritime platforms. The pilot involved physically co-locating IWSTs with contracting divisions, which allowed for better balancing of competing priorities and enabled cross-functional collaboration between those divisions.

"We are making sure that we are in alignment with the Naval Sustainment System-Aviation initiative to work more efficiently, and we have done some internal process improvements to ensure we are mission ready," said Rear Adm. Duke Heinz, commander, NAVSUP WSS. "Our new Op Model is enabling us to be more proactive, collaborative, accountable and action-focused."

The model provides NAVSUP WSS with a new, more structured cadence of engagements and a variety of innovative digital tools to complement these sessions. The model is comprised of three parts: Production Standups (PSs), Readiness Acceleration Boards (RABs) and Readiness Focused Stand-downs (RFSs).

PSs are daily, action-oriented meetings held with working level subject matter experts from an IWST, contracting team and Defense Logistics Agency (DLA). The teams use a PS Tracker tool that combines various data sources to provide visibility and updated information on priority unfilled customer orders (UCOs) and purchase requests, enabling a more productive discussion of high priority parts and contracting status. PS meetings drive action to the RAB and RFS.

The RAB serves as an escalation path for issues that cannot be resolved in a PS. It is a forum for NAVSUP WSS and DLA senior leadership to address the hard issues and overall IWST health using the RAB Dashboard tool, which combines key performance metrics and action items. The combined PSs and RABs leads to enhanced business performance by highlighting and solving some of the oldest and most complex issues.

"Our goal is to increase transparency and velocity in decision making, and have solution-focused communication at all levels," said Capt. Mike York, director of aviation operations, NAVSUP WSS. "Having leadership involved and engaged in the RABs has empowered our inventory managers and contracting specialists to become more innovative in their decision making and think outside the box."

In addition to PSs and RABs, IWSTs run reoccurring health checks through RFSs, where stakeholders form a tiger team to brainstorm and solve specific issues affecting readiness.

Teams have tackled many issues such as reducing ghost casualty reports (CASREPS), identifying past due vendors and reallocating retail stock. By getting all the experts in the same room, reoccurring issues are resolved much quicker. Data analysts are also heavily involved in RFSs to ensure solutions are actionable and sustainable.

To date, the Op Model has proven to be an effective new business practice. NAVSUP WSS has realized several improvements in readiness metrics, to include reductions in high priority backorders, CASREPS, UCOs and contract administrative lead-time as well as an increase in mission capable aircraft.

Jenae Jackson is NAVSUP WSS Public Affairs' deputy director.

Professional Reading

By Cmdr. Peter Mersky, USNR (Ret.)

South Pacific Air War, Volume 1 The Fall of Rabaul, December 1941-March 1942

By Michael Claringbould and Peter Ingman. Avonmore Books, South Australia. 2017. 252 pp, Ill.

South Pacific Air War, Volume 2 The Struggle for Moresby, March-April 1942

By Michael Claringbould and Peter Ingman. Avonmore Books, South Australia. 2018. 232 pp. Ill.

South Pacific Air War, Volume 3 Coral Sea & Aftermath, May-June 1942

By Michael Claringbould and Peter Ingman. Avonmore Books, South Australia.2019. 248 pp. Ill.

This is a most unusual trilogy to which we are devoting all of this issue's space, from a very unusual duo of authors, a pair of experts in their country's early air war history that is perhaps not that well known in the U.S. As far as American readers may be concerned, immediate post-Pearl Harbor activity was limited to a few reprisal raids on Wake, and then the two climactic battles of the Coral Sea in May 1942—which, admittedly, helped save Australia, or at least the northwestern coast of Australia, from Japanese invasion—and a month later, Midway, which might be argued to have stopped the Japanese advance across the Pacific at a very crucial time of the war and deprived the Empire of many of its highly experienced carrier aviators and prized carriers. While true, there's a lot more to this epic story, and these two Australian authors take that story much farther than we in the States might know.

Each of these closely-related books features new photos as well as well-done artwork and maps that ably support the authoritative text that present new facts and background to the story of those little-known post-Pearl Harbor days when, though much of the world had been engulfed in conflict, the war was separated in geographic boundaries. The Germans were fighting to conquer as much of the European mainland the blitzkrieg could give them. In turn, the Japanese with their ultra-militaristic society were eagerly bent on bringing all of Asia into their sphere of influence to create a society that would bring them out of the conflict between the whites and

U.S. Navy photo

A frame from a well-known series of photos shows two major personalities of the early South Pacific air war in their F4F-3 Wildcats, Lt. Butch O'Hare in the background and Lt. Cmdr. Jimmy Thach in the foreground. Note the Rising Sun kill flags below the cockpits.

Photo courtesy of Michael Claringbould

An A6M2 Zero launches from the Imperial Japanese Navy carrier Zuikaku during Operation R on Jan. 21, 1942. The two white bands around the rear fuselage indicate a "shotaicho," leader of a three-plane "shotai" tactical formation.

their own groups, and find their level of financial superiority. Little did people think there would soon be a meeting of the two warring factions that would, indeed, engulf the world.

"Volume 1" describes the circumstances of how Australia—the island continent down in the South Pacific, little known by the greater world population, with its own truly unique origins, both flora and fauna—stood alone, much like its mother country of England half the world away.

There were no heroic utterances about "the few" of the Royal Australian Air Force (RAAF) who proudly stood or flew alone in obsolescent aircraft such as the Wirraway, basically an armed version of a two-seat American trainer, against the best the Japanese put into the sky. Or the almost nomadic existence of the RAAF squadrons that based themselves in out-of-the-way one day to the next in featureless points on maps to launch meager strikes against the oncoming enemy, their dwindling resources of Lockheed Hudsons from America patrolling along the coasts or raiding the opposition with what were really light bombloads, often encountering interception by Japanese fighters whose pilots were in reality among the best in the highly competitive world of combat aviation.

Along with some aircraft from the U.S., early B-17Es and a few A-24 Banshees, basically Navy Scout Bomber Douglas Dauntless dive bombers flew missions to defend Australian territory with several American airmen being lost. The U.S. aircraft carrier, USS Lexington (CV-2), which had escaped the disastrous damage at Pearl Harbor, had reached the general area. The Lex's VF-3 with F4F-3 Wildcats were in operation against the Japanese, the most famous actions involving Lt. Cmdr. Jimmy Thach and Lt. Butch O'Hare, who received the Medal of Honor for his defense of his carrier on Feb. 20, which is well illustrated in "Volume 1's" outside back cover.

"Volume 2" begins to focus on what became Australia's concentrated defense of its northwestern territories, which began to feel the effects of initial Japanese sorties probing the Aussies' ability to defend themselves. Again, B-17s, now aided by Bell P-39 Airacobras, Martin B-26s, and Curtiss P-40s that were beginning to arrive from the U.S., raided Japanese facilities. The authors' combined research is fascinating, coupled with their selection of photos and graphics make all three of these books excellent accounts of these important but little known desperate actions when Australia stood alone so far away from the main conflict in Europe and the growing and, at the time, overwhelming momentum of the Japanese oceanic steamroller.

Those of us who read early accounts of the Japanese side such as "Samurai!" can recall the early pages where the ace Saburo Sakai, who has seen early action in China, comes to the island fortress of Rabaul, expecting to see a lineup of Zeros, then the most dangerous fighters in the Pacific. However, when he and his squadron land, many of them ill from the effects of the long voyage, they are distressed to see examples of the aging A5M Claudes they had flown over China more than five years previously. Actually a name given by the later Allied code-name system, the name Claude has stuck with WWII Japanese aircraft for ease of identification. It is true that in the early months of 1942, A5Ms still flew from Japanese flight decks as well as from shore bases, and the Australians give us rare coverage of the open-cockpit, fixed-landing gear fighters, in one of the more unusual aspects of these books, again supported by photos and now de rigeur displays of profiles.

"Volume 3" describes how the meager RAAF and United States Army Air Force (USAAF) continue to build up as they confront the Japanese armadas bent on conquering New Guinea, close to the northwest coast of Australia. In-depth accounts of the Battle of the Coral Sea on May 7-8, 1942, with an Australian twist are quite interesting, and give an almost daily story of the engagements between USAAF (not USAAC as written) P-39s, B-25s and B-26s against Zeros and the few remaining Claudes and various floatplanes as the Japanese mounted their somewhat disorganized invasion of New Guinea.

All together or separately, these unusual books represent a great history of a six-month period that has never been told in such detail, especially for American audiences. It should be said, however, that Osprey has published two related books: "Darwin 1942" by Bob Alford, in their Campaign series (no. 304), and "P-39/P-400 Airacobra vs A6M2/3 Zero-sen, New Guinea 1942 (Duel 87)" by one of the trilogy authors, Michael Claringbould.

Squadron Spotlight

Air Test and Evaluation Squadron (VX) 20

Established: June 16, 1945

Based: Naval Air Station Patuxent River, Maryland

Commanding Officer:
Cmdr. Matthew Tharp

Mission(s): ***Test and evaluate aircraft and systems in support of their delivery to the fleet; providing trained people, test ready aircraft and access to state-of-the-art facilities in support of the warfighting needs of the operating forces.***

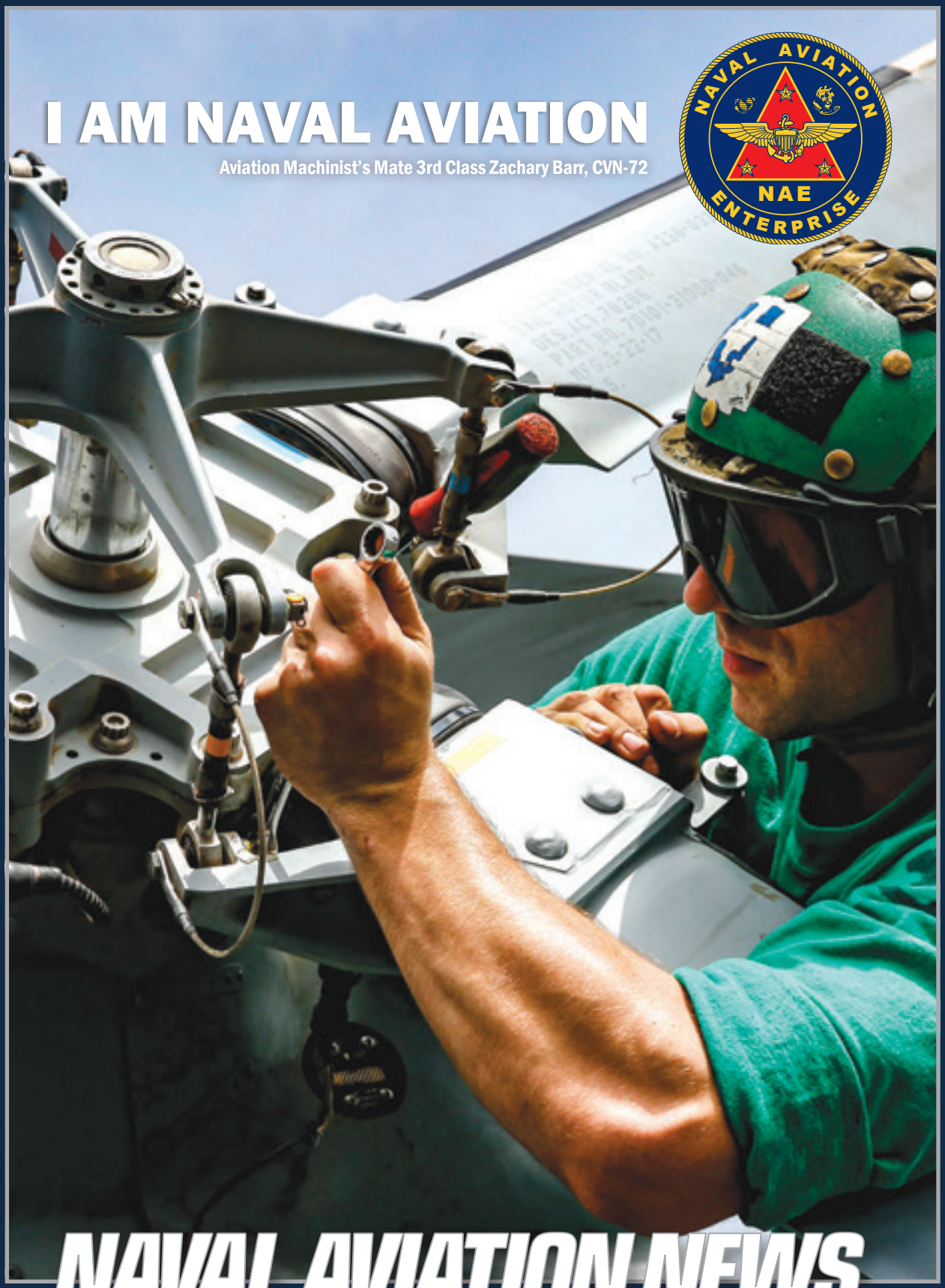
Brief History: VX-20 is a proud member of the Naval Air Systems Command, tracing our roots back to the founding of NAS Patuxent River. Recognizing the need to consolidate flight test efforts, the Navy established NAS Patuxent River on April 1, 1943, in a location selected for its proximity to the coast, limited air traffic congestion and isolation. On June 16, 1945, Naval Air Test Center (NATC)—including its Flight Test Division, Weapon Systems Test Division, Service Test Division and the United States Naval Test Pilot School (USNTPS)—was designated as the center for Navy flight test. In April 1975, NATC was reorganized into directorates: Antisubmarine Aircraft Test, Strike Aircraft Test, Rotary Wing Aircraft Test, Systems Engineering Test and USNTPS. The Antisubmarine Aircraft Test Directorate was renamed Force Warfare Aircraft Test Directorate in June 1986. In May 1995, the organization officially became a squadron and was renamed Naval Force Aircraft Test Squadron. The squadron was designated VX-20 in May of 2002. Throughout its history, VX-20 has supported the fleet through the full spectrum test and evaluation of scouting (VS), patrol (VP), carrier airborne early warning (VAW), fleet logistics support (VRC), electronic countermeasures (VQ), fleet tactical support (VR), patrol special unit (VUP), Marine aerial refueler transport (VMGR) and training (VT) community aircraft. Currently, VX-20 is tasked with developmental test and evaluation of all Navy E-2D Advanced Hawkeye, P-8A Poseidon, MQ-4C Triton, KC-130T/J Hercules, E-6B Mercury, C-2A Greyhound, C-38 Courier, UC-12B Huron, T-6A/B Texan II, EP-3E Aries, P-3C Orion, RQ-4 Global Hawk, C-27 Spartan aircraft and their associated mission and weapons systems. VX-20 also provides aerial refueling for the F-35 Lightning II, MV-22 Osprey and F/A-18E-F Super Hornet aircraft and safety/chase support aircraft for other platforms assigned to Naval Test Wing Atlantic.

Aircraft Flown: **E-2D, C-2A, P-8A, E-6B, C-130J, C-130T, UC-12M, C-38A, MQ-4C, plus various test-specific platforms of opportunity**

Number of People in Unit: **120 military (Navy, Marine Corps and Coast Guard), 42 civilians and 20 contractor aviators, 243 contractor maintenance, 500+ civilian engineers**

Significant Accomplishments: **In 2019, VX-20 executed more than 140 CNO-directed test and evaluation projects on 12 different type/model/series aircraft, totaling more than 1,300 sorties and 3,660 flight hours, surpassing 118,464 total flight hours of Class "A" mishap-free flight operations.**

U.S. Navy photo



I AM NAVAL AVIATION

Aviation Machinist's Mate 3rd Class Zachary Barr, CVN-72

NAVAL AVIATION NEWS

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