

NAVAL AVIATION NEWS

THE FLAGSHIP PUBLICATION OF NAVAL AVIATION SINCE 1917

SUMMER 2018

MH-60S GUNNER SEAT REDESIGNED FOR ENDURANCE



WHAT'S INSIDE

- ▶ HMS Queen Elizabeth Aircrew Meet F-35B
- ▶ EMALS and AAG Prove Viability
- ▶ Osprey Overhaul Underway



A C-2A Greyhound assigned to the “Rawhides” of Fleet Logistics Support Squadron (VRC) 40 prepares to launch aboard aircraft carrier USS George H.W. Bush (CVN 77).

U.S. Navy photo by MC3 Joe Boggio

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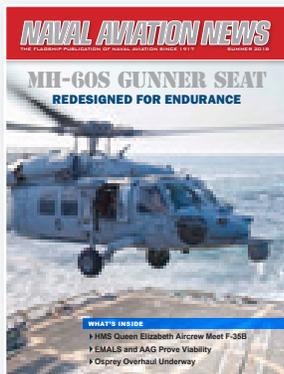
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ON THE COVER



On the cover: An MH-60S Seahawk helicopter, assigned to the "Chargers" of Helicopter Sea Combat Squadron (HSC) 26, takes off from the flight deck of Arleigh Burke-class guided-missile destroyer USS Pinckney (DDG 91) during a replenishment-at-sea. (U.S. Navy photo by MC2 Craig Z. Rodarte)

It's been a busy summer in Naval Aviation. In May, aircrew from the HMS Queen Elizabeth, flagship of the Royal Navy's new class of aircraft carriers, visited Naval Air Station Patuxent River, Maryland, for their first live glimpse of the F-35B Lightning II (page 24), and a prototype of a new gunner seat for the MH-60S Seahawk debuted to great enthusiasm at the Naval Helicopter Association Symposium (page 28). On May 31, Naval Air Systems Command welcomed its new commander, Vice Adm. Dean Peters, and he outlines his priorities for us in this issue's Flightline on page 4.

On July 9, a second MV-22B Osprey entered the Common Configuration-Readiness and Modernization program, or CC-RAM, an effort to consolidate the 70-plus variations in the MV-22B fleet by upgrading 129 "Block B" Ospreys to the current "Block C" standard. Five days later, USS Gerald R. Ford (CVN 78) entered a yearlong post-shakedown availability period (page 8) after spending the previous year conducting post-delivery test and evaluation, which included the execution of 747 aircraft launches and recoveries with the Navy's groundbreaking new Electromagnetic Aircraft Launch System and Advanced Arresting Gear (page 21). Meanwhile, Marines are using 3-D printers to produce replacement parts on-demand (page 34), and testing has begun on an alternative, commercially available cargo winch expected to save the CH-53K King Stallion program more than \$60 million (page 38).

On the back cover: Marines assigned to the 26th Marine Expeditionary Unit perform maintenance on an MV-22B Osprey on the flight deck of amphibious assault ship USS Iwo Jima (LHD 7). (U.S. Navy photo by MCS Dominick A. Cremeans)

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Flightline

Q&A with New NAVAIR Commander

Vice Adm. Dean Peters, who came aboard May 31 as commander of Naval Air Systems Command, shared his priorities with Naval Aviation News.

Tell us about your career.

I've served several acquisition assignments for NAVAIR and worked with our incredible workforce for many years supporting the fleet. Having said that, I learned a lot about fleet support in my first cruise as a helicopter pilot back when I was just an ensign flying H-2 Seasprites in the North Atlantic on board USS Jesse L. Brown (FF 1089), a Knox-class frigate. During that cruise, we spent hours tracking and trailing several Victor-class submarines deploying out of area, and I learned the criticality of shipboard operations. Despite successful operations, we also experienced many maintenance and reliability-related challenges during that cruise: the loss of an engine and subsequent single-engine landing to the back of a pitching deck during a very dark night. When opening the engine can of the replacement engine, there were multiple components with IOU tags in place of where the components should be. We weren't sure exactly why the engine failed, and so it was a little disconcerting to remove the fuel control and oil filter from the failed engine so that we could have a replacement. Through the continual wear of flight deck operations, we also needed to replace the main landing tire. Luckily, there was one available in our pack-up kit, but unluckily, it turned out to be an F-14 main-mount tire. Despite all of these hiccups, there was a singular focus on mission accomplishment that was evident in everyday operations on that ship.

Why are you excited about taking command of NAVAIR?

First and foremost is the opportunity to continue to serve the Navy and the Marine Corps. Naval Aviation is an incredible enterprise, with a rich and distinguished past, and the future success of Naval Aviation, to a large degree, is in our hands. Our people are truly the best in the business. They believe in the mission and are committed to the success of our Sailors and Marines. We have an opportunity to eliminate the reliability and maintenance-related issues that I experienced back in 1987 and give our aircrews more time to operate their mission systems instead of worrying about how the aircraft will perform or if it will be available.

Secondly, this is an exciting time for NAVAIR. Congress has made an investment in strengthening our nation's defense. It's up to us to execute smartly. Expectations are high, and I am confident we *will* deliver.

What are the biggest challenges facing Naval Aviation and NAVAIR today?

Let me first talk about opportunities. For many years, we've been in survival mode from a program standpoint, especially when procuring our

Approach Bravo Zulu!



Photo courtesy of Approach magazine

From left to right, Lt. Gerald J. Voorhies, Ens. Dean Peters and AW2 Charles R. Priestley.

HSL 32

Invader 135 completed a hot refuel cycle on board the USS Jesse L. Brown (FF 1089), and launched for a night ASW sortie. At approximately 20-25 nm, the caution light panel flickered showing a fuel boost problem and then extinguished. Lt. Voorhies (HAC) took control, reported the problem to his ship and turned toward homeplate. Ens. Peters (CP) broke out the pocket checklist and started going through the appropriate emergency procedures. AW2 Priestley made ready all gear for a possible ditching. The ship closed the aircraft's position.

At 18 nm the No. 2 engine fluctuated once (a 50 percent drop), regained its power output then completely flamed out. Restart attempts were unsuccessful.

At 5-10 nm, with the ship in sight, all ordnance was jettisoned, excess fuel dumped, and the ship turned to the best wind recovery course.

Superb airmanship and coordination between air crew and the ship's crew resulted in a successful night, single-engine, small-deck landing.

"Bravo Zulu" reprinted from the October 1987 issue of Approach magazine.

aircraft and weapons systems, and from a readiness enabler standpoint. With the support of Congress and the administration, we now have a coherent National Defense Strategy and clear commander's intent. Congress has appropriated the funds needed for program wholeness and readiness recovery.

Our challenge will be to take advantage of this increased support in a timely manner and get the most for every dollar entrusted to us ... whether it's procurement funding, spares or fleet support.

How did your assignment as the program executive officer for Air Anti-Submarine Warfare, Assault and Special Mission Programs (PEO(A)) prepare you for your role as NAVAIR Commander?

In the grand scheme of Naval Aviation, our program offices are accountable for providing capability and capacity to the fleet and coordinating all elements of life-cycle sustainment.

The success or failure of NAVAIR can only be measured by the success or failure of our acquisition programs, both in terms of how our current equipment is supported in the fleet, and how quickly and effectively new capability is delivered and supported.

Having served in multiple acquisition/program manager positions, I've seen what it takes to be successful:

- A shared identity (truly comprehending that we are the most responsible for fleet readiness and fleet capability)
- A shared vision (to aggressively provide readiness and capability at ever-increasing levels of safety, reliability, interoperability, maintainability and affordability)
- An organization that trusts and empowers teams to accomplish the vision

The Navy's top three priorities are restoring readiness and increasing lethality and capacity to project power and respond to threats. What strengths does NAVAIR bring to the fight?

Let's start with readiness. This is our No. 1 priority and strategic imperative. NAVAIR is not the only organization responsible for readiness of the fleet, but NAVAIR—and I'm including the Program Executive Offices—is the organization most responsible for fleet readiness. This is an important point. There are several organizations that contribute to readiness, but no other organization has the visibility and resources to stitch together all stakeholders on the material side. With the right tools, the Air Boss and Marine Corps Deputy Commandant for Aviation can generate readiness in support of our National Defense Strategy. Being the most responsible is an intimidating commitment. But the good news is that we at NAVAIR have the engineering and logistics talent, highly skilled depot artisans, and world-class contracting and financial managers—and I'm

confident that we have the organizational will to make the fleet successful.

Let's also touch briefly on capacity. This is another area where we have the opportunity to take advantage of increased resources by executing the procurement activities that result in greater capacity. There is no guarantee that this resourcing environment can be sustained, so it is imperative that we make the most of the opportunity while the support exists. It also requires us to be honest and timely if we cannot execute resources so they can be directed to other fleet needs.

What are your top three priorities for NAVAIR?

My priorities for NAVAIR are the same as my priorities were for my squadron command, my program commands and each subsequent command: mission, people and relationships. Let me talk about each of these, a little out of order.

PEOPLE: NAVAIR is a great place to work, because we take care of our people and respond to actionable feedback and because the work is exciting and meaningful. We will not make everyone happy 100 percent of the time, and our environment can be pressurized at times ... but under the right conditions, our people can accomplish anything. I expect our leaders to encourage people to think differently, empower them to act boldly and eliminate distractions that get in their way.

RELATIONSHIPS: NAVAIR is connected to, and dependent upon, many other entities, especially industry (large and small), and we need to cultivate those relationships. It starts with assuming goodwill and maintaining an open dialogue; and as an organization we will make this foundational.

MISSION: Mission is our No. 1 priority. Our mission is to acquire new capability (aircraft, weapons systems and associated equipment) for the fleet in a timely and affordable manner and to robustly sustain those aircraft and equipment such that they are available and effective when required. It's really that simple. I mention it last to make this point: if we get everything else right and don't accomplish our mission, we have missed the mark.

In terms of readiness, where do you think NAVAIR can make the biggest contribution to the fleet?

As mentioned a few times, NAVAIR is the organization most responsible for fleet readiness. It starts with the design process and insisting on reliable and maintainable equipment and components. Delivering operational-, intermediate- and depot-level capability with our systems gives the fleet the ability to control their own destiny to a much greater extent.

We also procure the initial spares, determine the inspection intervals and establish the maintenance planning and support equipment requirements. These are fundamental aspects of our mission. We are introducing new tools for tracking and monitoring maintenance, which will enable the Naval Supply Systems Command and the Defense Logistics Agency to predict parts requirements. We're also using reliability-centered maintenance to attack reliability issues and extend the life of components. I could go on, but I think you get the picture. NAVAIR is integral to the readiness of our fleet communities.

Anything else you would like to add?

We've talked about speed and responsiveness. The best ideas to accomplish our work will come from those closest to the work. That is what will ultimately make us faster, more responsive and more effective. It's an honor to serve this incredible organization in support of Naval Aviation. Thank you for the opportunity to share these thoughts with your readers. 🦅

A native of Louisville, Kentucky, **Vice Adm. Dean Peters** graduated from the U.S. Naval Academy in 1985. Peters has 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, Peters served as 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; 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. 🦅



U.S. Navy photo by Adam Stoczylas

Grampaw Pettibone

Gramps from Yesteryear: May-June 2008

Illustration by *Ted Wilbur*



Cobra Crunch!

All aircrew involved in a two-ship AH-1W Cobra mission had flown a similar event in the same working area at least once in the previous two days. On this day, the mission commander did not use a briefing guide for the brief. They did not discuss operational risk management during the brief nor did any of the aircrew sign an operational risk management (ORM) assessment. The mission commander did not brief instrument meteorological conditions (IMC) procedures, lost aircraft procedures, or how the aircraft were to rendezvous in flight if one aircraft was delayed.

At the conclusion of the brief there were no questions regarding the brief from the aircrew in attendance.

Local authorities familiar with the area briefed the crew concerning hazards, noise sensitive areas and airfield operations. Just over an hour later, the lead Cobra launched to conduct night reconnaissance operations in its assigned area. The second aircraft had maintenance issues during start up and launched 20 minutes later after corrective maintenance.

Upon checking in, local control transferred the division lead to a second facility. When Dash 2 checked in, the division lead asked the second aircraft to state their position. Dash 2 replied, "we are 14 miles northeast." Local control attempted to

contact Dash 1 but received no response. Dash 2 offered to relay. The ground controller passed to Dash 2 where he wanted the second section to conduct flight reconnaissance. Dash 2 relayed this information incorrectly. Dash 1's response was "roger, we are looking at something, standby."

Dash 2 then entered the working area and descended to approximately 300 feet. Eager to begin the reconnaissance mission and knowing that possible targets had been located, Dash 2 did so without determining the position of Dash 1.

Less than two minutes later, the flight paths of Dash 1 and Dash 2 merged in a co-altitude, right-to-right pass, at a separation of approximately 41 feet. Neither aircraft made an evasive maneuver prior to the collision. The two Cobras' blades struck

approximately 3 feet from the blade tip, tearing the rotor head and transmission assemblies from both aircraft. Both aircraft crashed and burned with all four aviators killed.

The subsequent investigation revealed that two of the mishap aviators had flown as a crew a few nights before the fatal flight. During that flight, the crew made numerous procedural errors and examples of poor airmanship, including airspace encroachment without permission. But following that flight, the section did not conduct a debrief. ✈️

Grampaw Pettibone says ...

Mishaps like this one get Gramps to wondering if anybody out there listens to him at all. If "brief the flight, fly the brief" ain't the oldest saw known to them what sport shoes o' brown then I don't know what is. I don't care how many times you done flown in an op area or how repetitive hops seem.

BRIEF THE FLIGHT. FLY THE BRIEF. Oh, and another thing: debrief the flight.

We may not have had a fancy ORM set up when I was flyin' missions, but we knew better than to ignore obvious risks. Not only did these folks ignore briefing procedures, but then they ignored another tool 'ol Gramps thinks is pretty good. ORM is that new fangled tool to find all the risks you might not'a seen before they become trouble. Just one more step that might have saved some lives.

Oh, you can—as Nipper Pettibone says—"blow me off" if you want. But before you do, think of these four dead aviators and this midair that was oh-so-preventable.

'Nuff said... again. ✈️



USS Gerald R. Ford Begins Post-Shakedown Availability



U.S. Navy photo by MC2 Cat Campbell

Aircraft carrier USS Gerald R. Ford (CVN 78) is pushed by tug boats as the ship enters Huntington Ingalls Newport News Shipbuilding to begin its post-shakedown availability.

WASHINGTON—USS Gerald R. Ford (CVN 78) arrived at Huntington Ingalls Industries-Newport News Shipbuilding in Newport News, Virginia, July 14, to begin a yearlong maintenance and upgrade period.

The ship's post-shakedown availability/selected restricted availability (PSA/SRA) follows the ship's successful completion of its post-delivery test and evaluation.

"Congratulations to everyone who has helped bring CVN 78 to this historic milestone," said Rear Adm. Brian Antonio, program executive officer for aircraft carriers. "Following Gerald R. Ford's delivery to the Navy on May 31, 2017, the ship's crew has been diligently and successfully conducting post-delivery testing and trial operations that identify construction and design issues. They have been extremely effective in identifying any issues early, which helps us address them prior to returning to the fleet."

Operating at sea for 81 days through eight independent steaming events, Ford completed fixed- and rotary-wing aircraft integration and compatibility testing, obtained an air traffic control center certification and a JP-5 fuel system certification, participated in daytime and nighttime underway replenishment capability demonstrations and a ship's defensive system demonstration, and underwent dual-band radar testing and propulsion plant operations. The ship completed nearly 750 shipboard aircraft launches and recoveries against a plan of

approximately 400 with the Electromagnetic Aircraft Launch System and Advanced Arresting Gear.

"One year ago this month, we commissioned USS Gerald R. Ford, the world's most technologically advanced aircraft carrier. Since that historic day, Ford has performed exceptionally due to a combination of innovative engineers, skilled craftsmen and professional and dedicated Sailors," said Rear Adm. Roy Kelley, commander, Naval Air Force Atlantic. "Since commissioning, her accomplishments are many. As she enters a necessary maintenance period, I'm excited to see what the future holds for CVN 78 when she returns to sea. No nation on earth can match the capability of USS Gerald R. Ford, a class of ship which will lead our Navy well into the 21st century."

The scheduled 12-month PSA/SRA will install remaining combat systems, complete deferred work and correct remaining discrepancies identified during sea trials and shakedown. The longest sequence of events, or "critical path," for this PSA/SRA period is advanced weapons elevator construction and advanced arresting gear upgrades.

After the PSA/SRA, Ford will conduct further trials and testing, including full-ship shock trials, before its first deployment. The ship will work up for deployment in parallel with its initial operational testing and evaluation.

From Naval Sea Systems Command Corporate Communications and USS Gerald R. Ford Public Affairs. 🇺🇸

Aircraft Carrier John F. Kennedy Reaches 75-Percent Structural Completion

NEWPORT NEWS, Va.—Aircraft carrier John F. Kennedy (CVN 79) is 75-percent structurally complete after recent installation of the forward area of the ship's main deck, Huntington Ingalls Industries announced April 30.

The second Gerald R. Ford-class carrier, Kennedy has been taking shape since its keel was laid in August 2015 at the company's Newport News Shipbuilding Division. The ship is being built using modular construction, whereby smaller sections of the ship are welded together to form structural units called "superlifts," which are then outfitted with piping, electrical equipment, cable, ventilation and joiner work before being lifted from the assembly area into the dry dock.

The 750-metric ton forward section of the main deck includes the machinery spaces located over the ship's forward diesel generators, as well as the first piece of the flight deck, which includes command and control, pilot ready rooms and additional support spaces, a jet blast deflector and components of the advanced arresting gear system.

Following recent superlifts, 341 of the ship's total 447 sections are currently in place. Kennedy stands approximately 100 feet in height in the dry dock, with only the island and main mast remaining to bring the ship to its full height.

A third key milestone was achieved when the first two generators supporting the electromagnetic aircraft launch system were installed.

"We are very proud of the progress we are making on the Kennedy," said Lucas Hicks, Newport News' vice president for the CVN 79 program. "The ship now is 75-percent structurally erected and more than 40-percent complete. Many of the improvements we have made over the construction of [USS Gerald R. Ford] CVN 78, including increased pre-outfitting and performing more complex assemblies in our shops, will allow us to launch the ship three months earlier than planned."

Kennedy is scheduled to be christened next year and delivered to the Navy in the early 2020s.

From Huntington Ingalls Industries Media Relations. 🦋



A forward section of John F. Kennedy's (CVN 79) main deck is lifted into place at Huntington Ingalls Industries' Newport News Shipbuilding Division.

Huntington Ingalls Industries photo by John Whalen



The first CH-53K King Stallion taxis across the flight line at Marine Corps Air Station New River, N.C.

First CH-53K King Stallion Delivered to Marines

ARLINGTON, Va.—The first CH-53K King Stallion was delivered May 16 to Marine Corps Air Station New River, North Carolina, marking another on-time milestone for the Marine Corps’ future heavy-lift helicopter program.

The helicopter, System Demonstration Test Article 3, will not fly as a regular asset until next year, but its arrival at New River enters it into a supportability test plan, during which Marines will assess the King Stallion’s maintenance, sustainment and overall aviation logistics support.

The CH-53K program remains on track for initial operational

capability (IOC) after the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics approved last spring the Navy’s request for the King Stallion to enter the production and deployment phase, a decision known as Milestone C.

“I am very proud of the work accomplished to deliver the most powerful helicopter ever designed into the hands of our Marines, and confident in the teamwork and dedication in this program, which will carry us to IOC,” said Lt. Gen. Steven Rudder, deputy commandant for aviation.

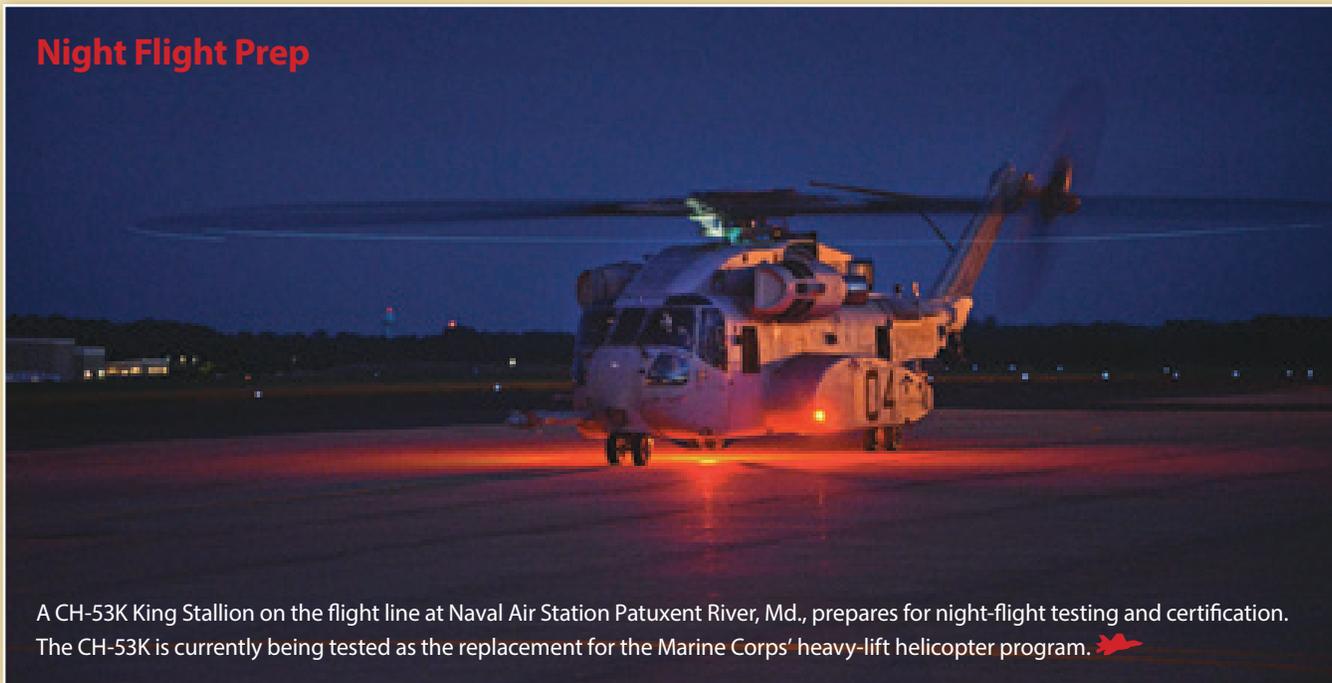
Since achieving Milestone C, the CH-53K test program has completed the following benchmarks:

- maximum weight single-point cargo hook sling load of 18 tons
- 60-degree angle bank turns
- 12-degree slope landings and takeoffs
- external load auto-jettison
- gunfire testing
- participation in the Berlin International Air and Trade Show

The King Stallion replaces the CH-53E Super Stallion as the production aircraft for the Corps’ heavy-lift mission, providing significant improvements in range and payload capabilities.

From the Office of Marine Corps Communication. ✈️

Night Flight Prep



A CH-53K King Stallion on the flight line at Naval Air Station Patuxent River, Md., prepares for night-flight testing and certification. The CH-53K is currently being tested as the replacement for the Marine Corps’ heavy-lift helicopter program. ✈️



U.S. Navy photos by MC2 K.R. Jackson-Smith



Sailors board an MV-22 Osprey tiltrotor aircraft to fly from Naval Station Norfolk to Marine Corps Air Station New River, N.C.

Sailors pose for a photograph during the historic flight of an all-Navy crew aboard an MV-22 Osprey tiltrotor aircraft.

Navy Conducts Historic Osprey Flight

NORFOLK, Va.—For the first time, the flight crew for a V-22 Osprey was all Navy, consisting of two Navy pilots and two aircrewmembers from Medium Tilt Rotor Training Squadron Detachment (VMTT Det.) 204, during a July 12 flight bound for Marine Corps Air Station (MCAS) New River in Jacksonville, North Carolina.

VMTT Det. 204 is the first unit set to operate and maintain the tiltrotor aircraft as it transitions into the fleet to replace the fixed-wing C-2A Greyhound.

The Navy's next carrier onboard delivery (COD) platform, the CMV-22B Osprey will deliver personnel, mail and cargo to aircraft carriers from land-based supply centers, a mission the Greyhound has performed since 1966. The Osprey's addition to the Navy fleet—the Marine Corps and Air Force already have their own V-22 variants—comes with a merger of skilled fixed-wing and helicopter pilots, forming a melting pot of expertise as the new CMV-22B community emerges.

"Let me start by saying thanks for what you're doing here," said Rear Adm. Roy Kelley, commander, Naval Air Force

Atlantic, during an all-hands call with the Sailors of VMTT Det. 204, a part of Airborne Command and Control Logistics Wing (ACCLOGWING). "You are all pioneers, and as we move into a new platform, I think you all really have an opportunity to lay the keel for where this community is going to go."

The Osprey's unique vertical takeoff and landing capabilities mirrors a conventional helicopter while also boasting the long-range cruise abilities of a fixed-wing airplane.

"I used to work on MH-60R [Seahawk helicopter] aircraft, and they're a pretty smart aircraft, but the Osprey will tell us almost to the 'T' what's wrong with it," said Aviation Machinist's Mate 2nd Class Samantha Moore, whom Kelley recognized during his visit for her exceptional maintenance work and leadership. "The screens are much more descriptive, and there's so much room to work on this aircraft. It's mind-blowing compared to the helicopters."

"We've learned a lot about the Osprey. It's easier to operate, there's newer technology pumped into the cockpit of this aircraft and it's a lot easier for us to maintain," said Chief Aviation Structur-

al Mechanic (Safety Equipment) Richard Keillor, VMTT Det. 204's aviation life support systems division chief. "The Osprey's lift capability is greater, and it is capable of aerial refueling, making its range greater than that of the C-2. This aircraft also eliminates the need for arrested landings and assisted takeoffs, because the Osprey takes off and lands like a helicopter. This thing really encompasses the best of both worlds."

ACCLOGWING Deputy Commodore Capt. Matthew Duffy spoke about the significance of this day to the future of Naval Aviation and Navy history.

"Today's visit was special," Duffy said. "We had an opportunity to accompany Rear Adm. Kelley down to MCAS New River to visit the 70 Navy Sailors, the plank owners, the first generation of pilots, aircrewmembers and maintenance technicians that are in training, right now, to fly the Osprey. Today was also a historic day, because our flight with Rear Adm. Kelley was the first time in history that the entire flight crew for the Osprey was all Navy—both pilots, both crew chiefs."

Written by Mass Communication Specialist 2nd Class K.R. Jackson-Smith. ✨

NAVAIR Delivers First Electronic NATOPS to Triton Community

PATUXENT RIVER, Md.—Shedding the paper and moving from a paradigm as old as Naval Aviation itself, the Naval Air Systems Command (NAVAIR) approved and released in June preliminary MQ-4C Triton training, operations and technical information manuals exclusively in digital format.



The MQ-4C Triton became the first platform to offer all-digital training and operations manuals in June.

Delivering electronic Naval Air Training and Operating Procedures Standardization (NATOPS) and Naval Aviation Technical Information Products flight manuals meets Triton program requirements and begins the integration of electronic publications into the electronic flight bag.

By adopting the electronic NATOPS approach now, Triton will align with the Navy's strategic digital transformation efforts and is well positioned to fulfill future digital cockpit capabilities requirements.

The preliminary manuals describe essential aircrew operating and mission system procedures and technical data to support upcoming Triton employment.

NAVAIR is collecting fleet operational experience and feedback on the preliminary Triton NATOPS, including the publication's usability, readability and accuracy, and will

incorporate that feedback in future updates to improve aircrew effectiveness and overall mission readiness.

Compared to legacy programs, Commander, Naval Air Forces guidance gives Navy unmanned air systems (UAS) model managers the ability to shape the look and feel of their NATOPS based

on community-derived requirements. Triton is leading the way by developing its publications to best serve the mission and influence aircrew electronic publications for the broader Navy and Marine Corps manned and unmanned communities.

While the Triton preliminary NATOPS is the first exclusively electronically delivered NATOPS product set, it is also the fourth UAS type/model/series entry in the NATOPS flight manual inventory in less than three years.

As Triton continues system development, so too will the Triton NATOPS product set evolve to respond to the community's operational needs.

Written by Robert Pudlo, senior airworthiness engineer at the Navy and Marine Corps National Airworthiness and Cybersafe Office at NAVAIR. 🐦

U.S. Navy, Australia Sign Agreement for Triton UAS

PATUXENT RIVER, Md.—The Australian government signed a memorandum of understanding (MOU) with the U.S. Navy June 25 to purchase up to six MQ-4C Triton unmanned air systems (UAS).

The MOU outlines the cooperative agreement between the two countries, allowing Australia to influence the program's future design and development.

The Royal Australian Air Force plans to operate Triton alongside the P-8A Poseidon to support its maritime patrol and other surveillance roles.

“Our team is eager to partner with Australia and enhance our ability to improve Australian and U.S. capabilities



An MQ-4C Triton.

in that region,” said Capt. Dan Mackin, program manager of the Navy's Persistent Maritime UAS Program Office. “This MOU allows for an enhanced partnership with our Australian counterparts and will allow us to work side by side in further developing the Triton program.”

The Navy recently delivered the

first operational aircraft to Point Mugu, California, to prepare for an early operational capability (EOC) employment to the Pacific later this year. The EOC will include two baseline aircraft equipped with multiple maritime sensors.

Written by Program Executive Office Unmanned & Weapons (PEO(U&W)) Public Affairs. 🐦



U.S. Navy photo

A KC-130J configured with the Marine Corps Harvest HAWK Plus weapons system fires a Hellfire missile in April during a developmental and operational test at Naval Air Weapons Station China Lake, Calif.

KC-130J Completes Successful Harvest HAWK Plus Testing

PATUXENT RIVER, Md.—The Harvest Hercules Airborne Weapons Kit (HAWK) Plus (HH+) installed on a newly configured KC-130J transport aircraft successfully struck fixed and moving targets during a five-week developmental and integrated test (DT/IT) live-fire event.

“The successful employment of this capability during live fire closed out the developmental and integrated test and positioned us

to move into the follow-on test and evaluation phase of the program,” said Capt. Steve Nassau, Tactical Airlift Program Office program manager. “The KJ

[Integrated Warfighting Capabilities] IWC team did an outstanding job with our industry partners to correct hardware and software deficiencies with such dramatic results. The HH+ weapons kit will provide a significant combat multiplier to the Marine Air-Ground Task Force.”

The live-fire test, conducted at Naval Air Weapons Station China Lake, California, in April, also included four

dedicated tactical integration flights to support operational test objectives in conjunction with the weapons tactics instructor (WTI) course at Marine Corps Air Station Yuma, Arizona.

“These flights proved to be some of the most fruitful flights of the entire detachment,” said Maj. Nate Houle, test pilot and project officer for Air Test and Evaluation Squadron (VX) 20. “The repeated ability of multiple fleet

“To a Marine, each operator left the flight impressed with the system and eager for fleet deployment.”

operators to rapidly learn and employ the system in an operationally relevant tactical scenario within a short timespan became a staple of each flight. To a Marine, each operator left the flight impressed with the system and eager for fleet deployment.”

Houle recommends capitalizing on any opportunities to integrate DT/IT with WTI courses in the future.

“The success of the live-fire event

was directly attributed to the selfless dedication and hard work of the KJ IWC [integrated product team] IPT, fleet Marines, VX-20 test personnel, China Lake range personnel, industry partners and [Marine Aviation Weapons and Tactics Squadron (MAWTS) 1] Marines,” said Brian Katafiaz, KC-130J IWC IPT lead. “This is a testament to inter-agency cooperation and teamwork that needs to be nurtured for

future efforts as a recipe for success.”

The team is developing an engineering change proposal to improve the Hellfire weapons capacity and allow for future capability expansion

by ensuring interoperability.

The HH+ helps provide the Marine Corps with extended on-call close air support capabilities, and is an upgrade to the original Harvest HAWK roll-on, roll-off precision strike package weapons system.

Written by Valerie Doster, communications support, and Brian Katafiaz, KC-130J integrated warfighting capability lead. 🐦

U.S. Naval Test Pilot School Accepts Flying Classroom

PATUXENT RIVER, Md.—The U.S. Naval Test Pilot School (USNTPS) welcomed an Airborne Systems Training and Research Support (ASTARS) III aircraft, the newest generation of flying classroom, June 29.

The third generation of flying classroom for the USNTPS curriculum, ASTARS III is a custom tailored C-26A Metroliner equipped with military equipment and subsystems, plus a simulation lab that was built in conjunction with the aircraft to have matching crew stations.

The purpose of ASTARS is for students to familiarize themselves with the aircraft and its systems in a simulation lab before flying for the first time, thereby increasing the efficiency of flight time spent with instructors in the air. The school's original ASTARS is a divested P-3, while ASTARS II is a leased, modified Saab 340 whose contract ends this fall.

“The amount of proactive collaboration on this project is unprecedented,” said Jerry Swift, director of the Naval Air Warfare Center Aircraft Division (NAWCAD) AIRWorks program, the systems integration office that cultivates the command's organic capability to develop rapid warfighter solutions.

The school received the C-26A in fall 2015 after it retired from conducting counter narcotics missions along the Mexican border. The aircraft arrived with minimal documentation and



The custom tailored C-26A Metroliner is the United States Navy Test Pilot School's third Airborne Systems Training and Research Support (ASTARS) used as a flying classroom.

maintenance records, requiring extensive work to meet FAA standards. It also needed unique modifications to meet the school's flying classroom requirements for future curriculum.

The upgrades were a group effort between a number of organizations—USNTPS; AIRWorks; the tactical airlift, adversary and support aircraft program office; and M7 Aerospace, a subsidiary of Elbit Systems of America. Pilots, engineers, artisans, supply chain specialists, program managers, test representatives and other crew members from each group worked side-by-side daily at the modification site in San Antonio. The project structure reduced programmatic cycle times while maintaining the aircraft's configuration control.

The approach was another example of effort coordinated by AIRWorks, bringing together warfare center talent, industrial partnerships and emerging technologies.

From NAWCAD Public Affairs. 🐦

Navy Adds New UAS Test Squadron

PATUXENT RIVER, Md.—The Navy will stand up a new squadron Oct. 17 to test and evaluate unmanned aircraft systems (UAS) at Webster Outlying Field in St. Inigoes, Maryland.

In an April 10 notice, Chief of Naval Operations Adm. John Richardson approved establishing Air Test and Evaluation Squadron (UX) 24 as a shore command “to provide research, development, test and evaluation support for Navy and Marine Corps unmanned aviation systems.”

These tasks are currently performed by the Unmanned Aircraft Systems Test Directorate (UASTD), a component of Naval Test Wing Atlantic (NTWL) based at Webster Field, “but growth in the field of UAS requires establishment of a command dedicated solely to that mission,” the notice states.

To staff UX-24, personnel will be transferred from NTWL and the Naval Air Warfare Center Aircraft Division. Retired Vice Adm. Paul Grosklags, then-commander of Naval Air Systems Command, requested the squadron's establishment.

Written by Jeff Newman, Naval Aviation News staff writer. 🐦



A U.S. Marine Corps RQ-21A Blackjack inflight during a training exercise.

Autonomous Helicopter Technology Wins Another Major Award

ARLINGTON, Va.—The Office of Naval Research (ONR) and Aurora Flight Sciences won the Howard Hughes Award from the American Helicopter Society May 17 for their joint work on the Autonomous Aerial Cargo Utility System, or AACUS.

Developed under an ONR innovative naval prototype program in partnership with Aurora Flight Sciences, AACUS enables rotary-wing aircraft to fly completely autonomously, even in austere environments. The program is now with the Marine Corps for further testing and development.

“The team is honored to be recognized for our work,” said Knox Millsaps, head of ONR’s air warfare and weapons department. “But we’ll know if our work has been a real success if it can keep even one more warfighter safe and out of harm’s way during a resupply mission—that’s our true measure of success.”

AACUS is a package of sensors and software that can be integrated into rotary-wing aircraft to deliver cargo to Marines in the field safely, reliably and rapidly using autonomous capabilities.

The system employs an intuitive handheld tablet that allows Marines in the field to call up needed supplies quickly and easily, a capability displayed in December when AACUS successfully completed its final demonstration—featuring a UH-1 Huey helicopter—at the Urban Training Center at Marine Corps Base Quantico, Virginia. A highlight of the demonstration included a Marine requesting an autonomous resupply after only 15 minutes of training.

“The AACUS technology provides a revolutionary way to resupply our forces in the field,” Millsaps said. “It could simplify the logistics train for supplying critical warfighting cargo to forward-deployed troops and do this in a more economical manner without placing human pilots at risk in high-threat environments.”

AACUS has also won and been

nominated for other high-profile honors. Earlier this month, the program received the Xcellence Award in the category of “Detect and Avoid” from the Association for Unmanned Vehicles Systems Interna-

tional. The technology was also a finalist for the National Aeronautic Association’s 2017 Robert J. Collier Trophy.

Written by Sierra Jones, Office of Naval Research. ✈️



An UH-1 Huey helicopter equipped with the Office of Naval Research-sponsored Autonomous Aerial Cargo Utility System (AACUS) kit departs a landing zone following a resupply mission that was requested using a handheld tablet at Marine Corps Base Quantico, Va.



A UH-1 Huey equipped with the Office of Naval Research-sponsored AACUS kit.

Coast Guard Cadets Redesign Helicopter Rescue Basket

NEW LONDON, Conn.—U.S. Coast Guard Academy cadets studying mechanical engineering have prototyped a rescue basket that could revolutionize how the Coast Guard conducts search-and-rescue (SAR) missions with MH-60 Jayhawk helicopters.

First class cadets Christian Breviario, Riely Brande, Benjamin Crutchfield, Nolan Richerson and Spencer Smith spent the last year working closely with the Coast Guard Research and Development Center (RDC) to improve the current basket's design after receiving input from SAR fleet operators.

"In 2009, the RDC conducted an internal Coast Guard study," said M.J. Lewandowski, a research project manager for the RDC. "The study noted that the Coast Guard's ability to respond to mass rescue incidents was, and still is, somewhat limited in the methods available to remove large numbers of people from a hazardous marine situation quickly and safely."

The RDC and academy leaders approached Breviario and his capstone group at the beginning of their senior year to see if they could improve the current basket design.

"We have added a means of entry that is easier for people who may be injured or have limited mobility," Breviario said. "We have also maximized the space dimensions of the basket, given the dimensions of the MH-60 Jayhawk cabin. With these modifications, we have made the basket more accessible, decreased the amount of time needed per hoisting evolution and improved upon the effectiveness of the Coast Guard during mass rescue incidents."

During mass rescue scenarios in which 18 or more people require helicopter assistance,

the cadets have determined the new basket—roomy enough to sit two people comfortably—could halve the time required to get everyone hoisted on board.

The cadets also reconfigured the basket's flotation system, increasing its buoyancy by 79 pounds of force. This upgrade will also make the basket more comfortable for those being rescued, since they will be surrounded by buoyant material on all sides.

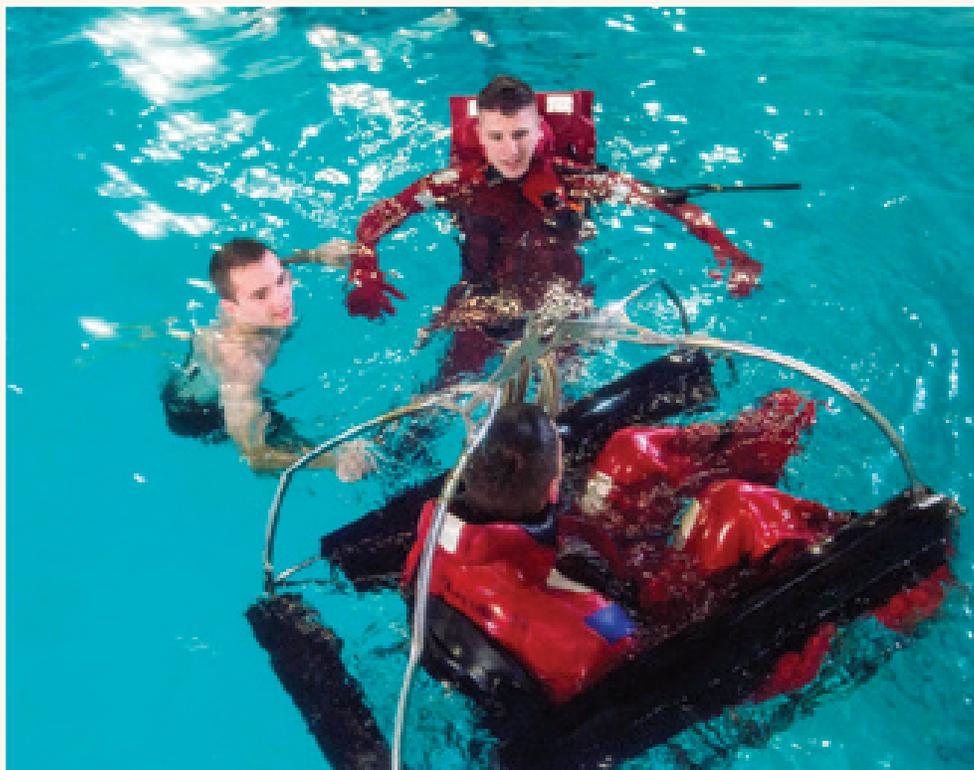
Breviario and the rest of his capstone group graduated in May and will enter the fleet as ensigns. Their project has garnered interest from the Coast Guard's Office of Aeronautical Engineering and the Aviation Logistics Center, which will consider whether to take the project into a refinement and testing phase.

"Their project absolutely showcases what they've learned during their four years as engineering students, as well as pushed them to go beyond what we taught them and learn new topics and techniques on their own," said Cmdr. Matthew Walker, a pilot and mechanical engineering instructor at the academy. "I am intrigued by the team's approach to this project and to see where it goes from here."

Breviario said he hopes to see the design implemented into the fleet as the new standard rescue basket used in Coast Guard operations. The capstone group is pursuing a patent for its design.

Written by Petty Officer 3rd Class Nicole Foguth, U.S. Coast Guard Academy.

Coast Guard Academy cadets studying mechanical engineering test out their new rescue basket design at a simulator facility in New London, Conn.



Coast Guard photo by Petty Officer 3rd Class Nicole Foguth



U.S. Navy photo by Ens. Jalen Robinson

Aviation machinist's mates prepare the MQ-8C Fire Scout unmanned helicopter for launch aboard littoral combat ship USS Coronado.

Milestone MQ-8C Fire Scout Initial Operational Test and Evaluation Complete

SAN DIEGO—USS Coronado (LCS 4) and Air Test and Evaluation Squadron (VX) 1 completed the first comprehensive initial operational test and evaluation (IOT&E) for the MQ-8C Fire Scout June 29.

Results from this test event will inform decisions on how best to integrate the Navy's newest unmanned helicopter with littoral combat ships (LCS) and other platforms.

During the IOT&E, the Fire Scout performed several mission scenarios aboard Coronado off the coast of southern California, important milestones for the LCS and Fire Scout programs that demonstrated cohesion between the surface and aviation platforms.

"The results, lessons learned and recommendations reported on following this underway test period are absolutely invaluable to the future of the MQ-8C

Fire Scout's mission effectiveness and suitability to perform that mission," said Lt. Cmdr. Seth Ervin, lead for the VX-1 detachment aboard Coronado.

Test results confirmed that, while it would require extensive planning and coordination across the ship, the MQ-8C and MH-60S Seahawk can be operated and maintained simultaneously.

"It has been challenging and rewarding to be one of the first maintainers afforded the opportunity to take both aircraft aboard the ship," said Aviation Machinist's Mate Second Class Salvatore Greene, a member of VX-1. "Working together, we made the overall product more functional and efficient for the fleet."

Meanwhile, the IOT&E gave Coronado's experienced crew an opportunity to contribute to technological and tactical improvements within the LCS community.

"My crew is excited to build upon

their past experiences operating with Fire Scout and continue to improve our proficiency as a warfighting team," said Cmdr. Lawrence Repass, Coronado's Commanding Officer.

The Fire Scout's first ship-based flight occurred December 2014 aboard USS Jason Dunham (DDG 109), and it conducted previous underway testing with USS Montgomery (LCS 8) in April 2017.

Pierside testing of the MQ-8C Fire Scout continued aboard Coronado throughout mid-July with a focus on maintenance and cyber.

LCS is a high-speed, agile, shallow draft, mission-focused surface combatant designed for operations in the littoral environment, yet fully capable of open ocean operations.

Written by Lt. j.g. Caroline Zotti, Commander, Littoral Combat Ship Squadron One Public Affairs. 🦋

The French Connection: **U.S., FRENCH NAVIES** Complete **CHESAPEAKE 2018** Combined Exercise

By MC3 Zachary P. Wickline
and MC3 Joe Boggio

U.S. Sailors aboard USS George H.W. Bush (CVN 77) celebrated the completion of the Chesapeake 2018 training operation as the Rafale Marine launched into the distant skyline—the last French aircraft to depart from the aircraft carrier May 18.

During the exercise, Sailors with Carrier Air Wing (CVW) 8 and the French navy's (Marine Nationale) CVW (Groupe Aerien Embarque) embarked Bush from May 7-18 to conduct training and carrier qualifications—a series of arrested landings and takeoffs from an aircraft carrier to maintain their proficiency—while the French aircraft carrier Charles de Gaulle (R 91) undergoes maintenance. Charles de Gaulle is the only other short form takeoff nuclear carrier outside the U.S. Navy.

The French CVW consists of one E-2C Hawkeye, 12 Rafale Marine multirole combat aircraft and 27 pilots. The exercise began in April at Naval Air Station Oceana, Virginia, and continued at sea, where approximately 3,700 U.S. Navy and 301 French Sailors maintained, launched and recovered aircraft to strengthen interoperability between the two naval forces.

“The French sailors acclimated very well to the U.S. carrier and the environment because of their experience operating off the Charles de Gaulle,” said Capt. Sean R. Bailey, Bush’s Commanding Officer. “Our Sailors were very welcoming and supportive of the French sailors coming on board. Having the opportunity to live, interact and work together created strong bonds and friendships



A Rafale Marine assigned to squadron “17F” of the French navy lands on the flight deck of aircraft carrier USS George H.W. Bush (CVN 77).

U.S. Navy photo by MC3 Zachary P. Wickline



between the U.S. and French sailors, which, consequently, was an essential component for such success during this underway.”

Chesapeake 2018 provided valuable training for the U.S. and French carrier air wings as they conducted multiple combat scenarios, including cyclic flight operations and combat search-and-rescues, and a series of arrested landings and launches by aircraft from both countries. In addition, more than 180 training evolutions and missions were accomplished on board the ship.

One of the highlights was the arrival of the highest ranking officers from each navy: Chief of Naval Operations Adm. John Richardson and Chief of Staff of the French navy Adm. Christophe Prazuck.

While aboard, Richardson and Prazuck toured the ship and spoke with crew from both navies about interoperability and relations between the two.

“As I look out on the flight deck, waiting to see the next launch, it’s almost impossible to tell the difference between U.S. Sailors and French sailors as they prepare for the next launches,” Richardson said. “This is exactly the level of teamwork we’re going to need as we confront our high-end competitors in high-end blue water warfare.”

Richardson and Prazuck praised the crews for their commitment to performing well and to the long hours they put in to maintain combat readiness.

“All this is not merely a technical or a diplomatic exercise,” Prazuck said. “What we’re really doing is preparing to fight together in the future if we are ever called to do so, proving our seamless interoperability is a very powerful message.”

In April, both navies conducted air strikes on Syrian chemical weapons infrastructures, and in June 2016, Richardson presented Charles de Gaulle with a U.S. Meritorious Unit Commendation for the French navy’s success as the only non-U.S. navy entity to take command of U.S. Naval Forces Central Command’s Task Force 50 during Operation Inherent Resolve.

Mass Communication Specialists 3rd Class Zachary P. Wickline and Joe Boggio are members of USS George H.W. Bush Public Affairs. 🇺🇸



U.S. Navy photo by MCT Sean Hurt

From right to left in front, Chief of Naval Operations Adm. John Richardson and Chief of the French navy Adm. Christophe Prazuck watch a video during their visit aboard aircraft carrier USS George H.W. Bush (CVN 77).



U.S. Navy photo by MC3 Joe Boggio

Marine Nationale (French navy) Sailors are assigned float coats in preparation for an underway aboard aircraft carrier USS George H.W. Bush (CVN 77).



A Rafale Marine attached to squadron 17F of the French navy awaits pre-flight checks before flight operations aboard aircraft carrier USS George H.W. Bush (CVN 77).

U.S. Navy photo by MC3 Joe Boggio



U.S. Navy photos by MC3 Rebekah A. Watkins

A French Dassault Rafale M Fighter touches down on the flight deck aboard the Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75).

FRENCH AVIATORS Train Aboard TRUMAN

ATLANTIC OCEAN— As part of French Air Defense week in July, French Dassault Rafale M Fighters conducted exercises with F/A-18E/F Super Hornets and E-2D Hawkeyes from Carrier Air Wing 1 (CVW) embarked aboard USS Harry S. Truman (CVN 75).

The week long exercise is designed to demonstrate interoperability and increase readiness as U.S. aircraft integrated with French Navy counterparts during training and simulation maneuvers.

“France is our oldest ally and a vital partner in ensuring security and stability in the region and across the globe,” Rear Adm. Gene Black, commander, Carrier Strike Group 8, said in a statement. “The opportunity to integrate with French Naval Aviation helps us enhance our interoperability as we work to achieve common objectives.”

This is the second time this year French naval aviators trained with the U.S. Navy.

“It’s always an honor to have our great friends and partners aboard Truman,” said Harry S. Truman Commanding Officer, Capt. Nick Dienna. “This visit caps off a phenomenal few weeks operating in Sixth Fleet. Our Sailors were graciously welcomed in Marseille, and we are now working bilaterally with our French counterparts to hone our skills for joint operations whenever, wherever we are needed.”

From USS Harry S. Truman (CVN 75) Public Affairs. 🇫🇷



Navy photo by MC3 Rebekah A. Watkins

F/A-18 Super Hornets, assigned to Carrier Air Wing One, and French Dassault Rafale M Fighters fly over the Nimitz class aircraft carrier USS Harry S. Truman (CVN 75).

CATCH *and* RELEASE

By Jeff Newman

One year after they debuted on the newly commissioned USS Gerald R. Ford (CVN 78), the Navy's revolutionary new aircraft catapult and arresting gear have demonstrated their viability.

Since first launching and recovering aircraft at-sea July 28, 2017—six days after Ford's commissioning—the Electromagnetic Aircraft Launch System (EMALS) and Advanced Arrested Gear (AAG) have successfully executed 747 day-and-night catapult launches and arrestments of F/A-18E/F Super Hornets. The initial goal was to conduct between 400 and 500 such cycles prior to the post-shakedown availability (PSA) Ford began July 14, said Capt. Stephen Tedford, the former program manager for the Aircraft Launch and Recovery Program Office at Naval Air Systems Command. Tedford led the program office from September 2014 until his change of command on July 12.

Fully installed on Ford, the four EMALS catapults and AAG, which comprises three engines powering three arresting wires, are set for initial operational capability in 2019 and 2021, respectively, prior to the ship's first scheduled deployment.

Through January, Ford had six at-sea periods, four of which included EMALS launches and AAG recoveries. Multiple times, the systems launched and recovered more than 80 Super Hornets in a single day, including one day with more

than 110 cycles, and another with more than 130, Tedford said.

"We had a very successful fall demonstrating on CVN 78. We have an awful lot of work to do still, and we will always have work to do to maintain these systems and sustain them in the future, but they do work," Tedford said. "To me, the proof that we are doing things right is when I talk to the Sailors on 78, and when those Sailors tell me that they never want to go back to Nimitz, we got something right.

"After all, it's EMALS and AAG that truly make Ford an aircraft carrier."

Systems Deliver Advantages

EMALS and AAG are designed to, respectively, launch and recover a wider envelope of aircraft than the legacy steam catapult and MK 7 arresting gear. They also weigh less and require significantly less manning—AAG alone saves 65 tons and requires half the manning of the MK-7.

"The difference in performance, you can definitely feel it," said Lt. Cmdr. James Struck, a pilot with Air Test and Evaluation Squadron (VX) 23, who flew the first launch-and-recovery off Ford in July 2017. "With the old arresting gear, you catch the wire and have a constant

deceleration until you stop. With AAG, it tries to reduce the load on the aircraft. It's not a constant deceleration; it's controlled by software, so you catch the wire, and you can feel the system adjusting your deceleration profile."

Struck said launching with EMALS also feels "just a little bit different" than with steam catapults.

"EMALS is also driven by software, so the acceleration profile is slightly different, a little smoother," he said.

EMALS and AAG also promise significant quality-of-life improvements for Ford Sailors. The all-electric systems also generate far less noise and heat than the legacy steam catapult and hydraulic MK-7 arresting gear.

On the flight deck, EMALS largely resembles the steam catapults on Nimitz-class carriers, but below deck, it's a different story, said Aviation Boatswain's Mate (Launching and Recovery) Petty Officer 1st Class (ABE1) Daniel Rivera.

"The steam cats are made up of mainly hydraulic, pneumatic and mechanical components, so maintenance on them is very dirty, oily and usually under highly volatile conditions," he said. "On the other hand, EMALS is electrical. There are numerous cabinets and enclosures containing various electrical components



A Sailor from USS Gerald R. Ford's (CVN 78) air department loads an F/A-18F Super Hornet on to the electromagnetic aircraft launching system (EMALS).

Navy photo by MC3 Liz Thompson

“These are the systems of the future for the Ford class. Both systems have proven, demonstrated performance on Ford, and we’re already in production on both systems for CVN 79 and CVN 80.”

that require regular inspection, but the spaces are well-ventilated, and the equipment contains little to no grease or oil.”

“There is a huge difference between both systems,” ABE1 John Thompson said of AAG and the MK-7. “Along with being able to handle different types of aircraft, it also brings a completely different lifestyle for Sailors who will be operating the equipment. Going from a system which is primarily operated by hydraulics to a system driven by electricity and computer software and sensors, it greatly reduces the amount of maintenance from both a preventative and corrective standpoint.”

Built-in diagnostics identify compo-

nents in need of repair, making EMALS and AAG far more reliable and easier to maintain than the legacy systems.

“Life as a maintainer is much easier working on EMALS than on steam catapults,” Rivera said. “When there is a problem with EMALS, the system is able to determine exactly what is wrong, so there is less manpower needed to troubleshoot.

“Once the problem is identified, EMALS is more plug-and-play than steam catapults, meaning Sailors can simply remove a failed component instead of attempting to fix it on the spot. This results in less downtime of the equipment and more availability to complete the ship’s

mission of launching and recovering aircraft.”

Test and Evaluation Phase

Having completed land-based developmental testing at its test site at Joint Base McGuire-Dix-Lakehurst, New Jersey, EMALS will soon begin an integrated test and evaluation (IT&E) period, which will include system reliability testing.

A key performance parameter for any new aircraft system, reliability ensures operational readiness for the fleet. Single-day shipboard operations have shown that both systems are able to meet operational requirements.

“In developmental testing, we’re trying to find problems with these systems,” Tedford said. “We then take that data and do the best we can to generate predictions of what we think our reliability will be when we get to the ship.

“What we learned on CVN 78 last year was that our reliability for both systems was significantly better than our land-based data was predicting, which is a good thing.”

As for AAG, “the team has made incredible progress over the last two years,” Tedford said. The system has conducted more than 2,000 arrestments using deadloads, weighted sleds that replicate the mass and—when pushed by a jet car—force of an aircraft.

Following its year-long PSA, Ford is set to undergo flight deck certification with components of the entire air wing sometime in 2020, Tedford said.

Training and Logistics Underway

The Naval Air Warfare Center Training Systems Division in Orlando, Florida, is developing a virtual training classroom that will allow Sailors to practice on vir-



U.S. Navy photo by MC3 Ryan Carter

An F/A-18F Super Hornet assigned to the “Black Lions” of Strike Fighter Squadron (VFA) 213 prepares to land on the flight deck of aircraft carrier USS Gerald R. Ford (CVN 78).

tual EMALS and AAG systems displayed on 55-inch touchscreens. The classroom will be stood up at the Center for Naval Aviation Technical Training at Naval Station Norfolk, Virginia, so that when the Ford is in homeport, students can go straight from the virtual environment to the ship for direct, hands-on experience. Ford Sailors will also be able to deploy with a condensed version of the training program, so that they can train new shipmates as they arrive. The training should be ready for EMALS in fiscal 2020 and AAG in 2022, Tedford said.

Meanwhile, logistics teams are also working on both systems' Interactive Electronic Technical Manuals (IETMs), which allow Sailors to pull up drawings and other reference material when performing maintenance.

"These are the systems of the future for the Ford class," Tedford said. "Both systems have proven, demonstrated performance on Ford, and we're already in production on both systems for CVN 79 and CVN 80. It's not a question of if they will work; they do work. Now it's a question of getting all of the other pieces of any system's debut in line."

That includes everything related to maintainability, reliability, spare parts, training and logistics, "the pieces that typically come together toward the end of any development program," Tedford said.

His team is working with the Naval Supply Systems Command and Defense Logistics Agency to establish an EMALS and AAG supply chain, and planning kicks off next year for both systems' depot facilities.

"We've got EMALS and AAG debuted, so now the focus is on how we posture ourselves and the fleet to sustain them as a system, making sure that we're training the crew adequately and ensuring we are positioned for the future with CVN 79 and CVN 80. Instead of focusing on a single system, we are focusing on a fleet of systems. That's the challenge ahead of us," Tedford said.

Jeff Newman is a staff writer for Naval Aviation News. 🦅



U.S. Navy photo

The E-2C Hawkeye completes its first arrestment with Advanced Arresting Gear in Lakehurst, N.J., in June.



U.S. Navy photo by MC3 Cathrine Campbell

An F/A-18F Super Hornet assigned to Air Test and Evaluation Squadron (VX) 23 performs an arrested landing aboard USS Gerald R. Ford (CVN 78).

UK's HMS Queen Elizabeth Aircrew

Meet the F-35B

By Jeff Newman

Aircrew members from HMS Queen Elizabeth (R08), the flagship of the Royal Navy's new class of aircraft carrier, visited Naval Air Station (NAS) Patuxent River, Maryland, May 15, for their first peek at the F-35B Lightning II.

That afternoon, approximately 20 members of the HMS Queen Elizabeth flying control and flight deck control teams witnessed two F-35B test aircraft taxi, conduct short takeoffs and perform two vertical landings apiece. The ground shook as each aircraft approached the tarmac for its vertical landings, hovering for several seconds before descending. The landings and takeoffs were led by the F-35 Pax River Integrated Test Force (ITF) team.

The next day, the ship's team took over and, acting as landing signal officers, taxied and refueled an F-35B for the first time. Steady rain limited the team's activities on the third day of its visit before its departure for the United Kingdom.

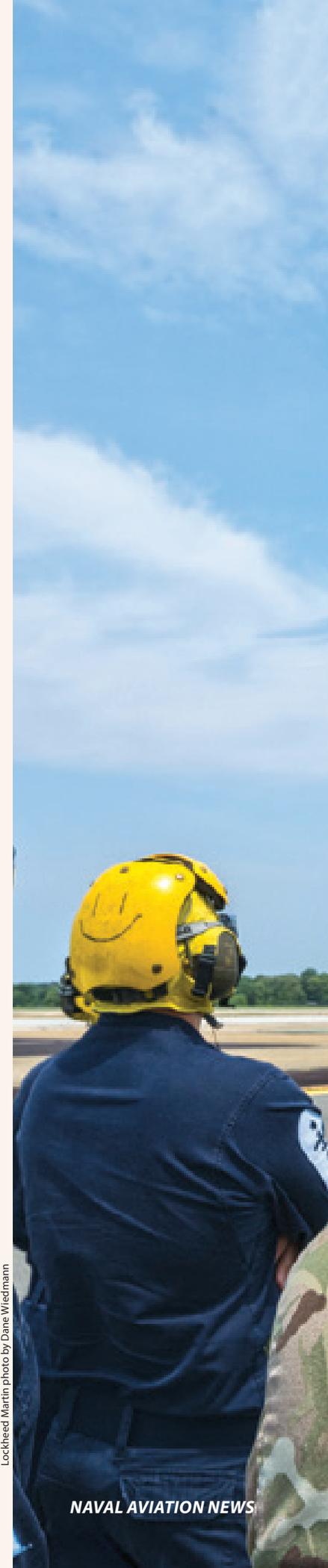
In terms of getting his crew familiar with the F-35B before this year's first ship trials off the U.S. East Coast, the trip was a success, said Royal Navy Cmdr. James Blackmore, Commander Air aboard HMS Queen Elizabeth.

"It's the first time they've ever seen the jet or been up close to it as it's performing its flight maneuvers," Blackmore said. "So they got to feel the environment of what it's like—the sort of noise, the heat, the sound and the pressure of the aircraft—so that when it comes to deck for the first time, it's not a surprise."

"It was a chance to actually see the aircraft flying properly, operate it, be close to the aircraft in its operation, move a real aircraft around, refuel a real aircraft," said Cmdr. Stephen Crockatt, U.K. lead at the ITF. "The U.K. does have some models, which we use for flight deck training, but those are models. They're representative, but not to the level of having a real aircraft."

For instance, Crockatt noted, attaching a fuel hose to a quiet, model aircraft is far

Lockheed Martin photo by Dane Wiedmann





Royal Navy aircrew from HMS Queen Elizabeth observe an F-35B Lightning II land vertically May 15 at Naval Air Station Patuxent River, Md. The fifth-generation fighter will conduct its first ship trials aboard the new carrier this fall.



BF-02 was one of two F-35B Lightning II test aircraft to demonstrate vertical landings for visiting HMS Queen Elizabeth aircrew May 15 at Naval Air Station (NAS) Patuxent River, Md.

Lockheed Martin photos by Dane Wiedmann

different an experience than doing so to an F-35B with its engine on.

“It actually gave them the realism that’s needed,” he said. “So the effect of appreciating the real aircraft is going to be a lot greater after this visit, and when we bring the aircraft to land on the carrier, it’ll be more of a known element.”

The F-35B’s “first-of-class” flight trials aboard HMS Queen Elizabeth will be conducted in three phases, Crockatt said.

“This is quite a massive trial for not only the U.K., but for the ITF,” he said.

Just as important for the HMS Queen Elizabeth crew was meeting and working with the ITF members who will be aboard the ship during trials, ensuring both teams understand how each operates and will work together.

“As we get toward the trial, that kind of mutual understanding will make it better,” Crockatt said.

“Because when we go to the trial, we are not the ITF or Queen Elizabeth; we are the total capability, which is getting a first-of-class flight trial operating envelope for the Lightning II for the future for the U.K.”

After the ship trials, the U.K. will conduct operational test and evaluation for its F-35B maritime operations next year, Crockatt said.

As HMS Queen Elizabeth’s “air boss,” Blackmore is in charge of all aviation on board a ship “that’s been designed specifically for the F-35,” he said.

At roughly 65,000 tons, HMS Queen Elizabeth is much smaller than U.S. Navy carriers, but its flight deck and hangar are approximately the same size, Blackmore said. The key difference between the two nation’s aircraft carriers is the Queen Elizabeth class’s flight deck, which is designed exclusively to handle helicopters and the F-35B, the short-takeoff-and-vertical-landing variant of the fifth-generation fighter.

“From the keel up, it’s all been about F-35 from day one,” he said.

For the U.K., the F-35B represents a return to carrier aviation, one that holds particular significance for Blackmore, who, in November 2010, piloted the last Harrier II flight off the HMS Ark Royal, the U.K.’s last aircraft carrier. Equally fitting, the Ark Royal’s captain at the time, Commodore Jerry Kyd, is now captain of HMS Queen Elizabeth.

“So if you like, I almost closed down what we used to do,” Blackmore said. “The fact that, eight years later, I’m now here opening that back up with the team is really good.”

Despite that years-long gap in U.K. carrier aviation, HMS Queen Elizabeth will have plenty of experienced



Two members of HMS Queen Elizabeth’s aircrew share observations during their first live look at the F-35B.



Aircrew from HMS Queen Elizabeth watch as an F-35B taxis by.



"I was fortunate enough to fly the last ever Harrier launched from a U.K. aircraft carrier in 2010, so if you like, I almost closed down what we used to do. The fact that eight years later, I'm now here opening that back up with the team is really good."

—Cmdr. James Blackmore, Commander Air aboard HMS Queen Elizabeth.

carrier pilots and crew on board—in recent years, the Royal Navy has embedded personnel on U.S. carriers “so we can keep that skill set alive,” Crockatt said.

“But even then, the alive skill set is on an F/A-18 or on a Harrier,” he noted. “The Lightning II is, of course, a different beast.”

Blackmore called the F-35B “a step change for the U.K. in how we’re going to conduct business.”

“The fact that it’s a F-35 is pivotal, because you’re in the fifth-generation game now with aircraft, which brings stealth, sensor fusion, advanced weapons and the ability to project aviation and power ashore at your choosing,” he said.

Jeff Newman is a staff writer for Naval Aviation News. 🐦



HMS Queen Elizabeth aircrew members discuss procedures for towing an F-35B.



Aircrew from HMS Queen Elizabeth practice attaching a tow bar to the landing gear of an F-35B during their visit.



A landing signal officer from HMS Queen Elizabeth practices directing an F-35B.

MH-60S GUNNER SEAT: PROTOTYPE WELL RECEIVED

Written By Aircrew Systems Program Office, Photography by Mikel Lauren Proulx



Fleet replacement Aircrewman (FRAC) Eugene Schoen, with Helicopter Sea Combat Squadron (HSC) 2, demonstrates the typical seated position of an MH-60 gunner in May. Note that the barrel on the M240 gun is missing.



Right, Naval Aircrewman Petty Officer Third Class (AWS3) Hunter Hill, a Fleet Replacement Squadron (FRS) instructor with HSC-26, and AWS2 Thomas Denys, with HSC-2, evaluate the features of the gunner seat prototype during a simulated ingress procedure.

In the MH-60S Seahawk, aircrew can spend hours at a time in the helicopter's gunner seat, which was designed for crashworthiness, but not necessarily operator endurance. Among MH-60S aircrews, the seat is notoriously uncomfortable, to the extent that it can be detrimental to long-term aircrew health, and fielding a replacement is Naval Aviation's No. 2 safety priority, right behind resolving physiological episodes.

"You were able to crash in [the current seat], but you weren't able to sit in it for extended periods of time," said Rabea Shaiboon, student control and curriculum chief petty officer at Helicopter Sea Combat Squadron (HSC) 2. Shaiboon, who is more than six feet tall, has been serving as the stand-in for the end user for the program office team.

In May, the Aircrew Systems Program Office debuted its second prototype (PT2) of the new MH-60S gunner seat at the Naval Helicopter Association Symposium (NHA) in Norfolk, Virginia, where it was met with excitement and gratitude on the

When it comes to warfighting, survivability has topped comfort for the past few decades, but that doesn't mean comfort isn't a factor, especially when comfort issues degrade aircrew endurance and mission performance.

part of the Navy Sailors who sat in it. New features on PT2 include: height adjustability, lumbar support, adjustable additional leg room, the ability to recline, a flip-up seat bottom, redesigned restraints, a redesigned headrest to accommodate the night-vision goggle battery, and tracks to allow the seat to move to and from the window.

The same week that PT2 was unveiled at NHA, flight and ground testing began at HSC-2 in Norfolk. Air Test

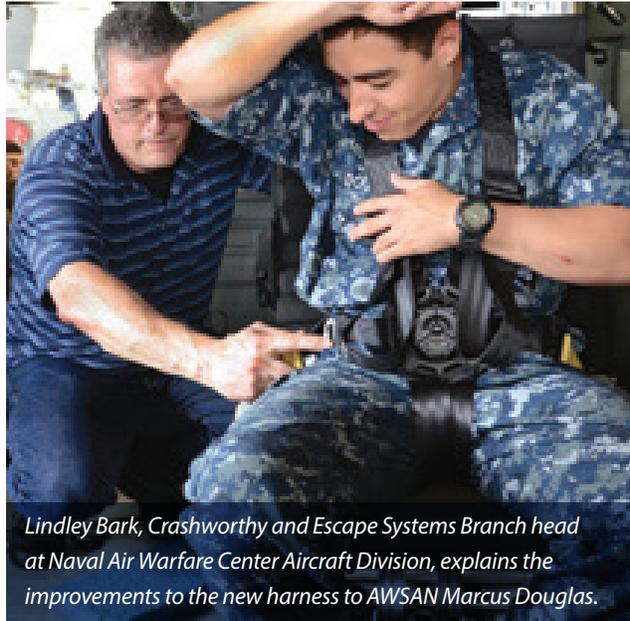
and Evaluation Squadron (HX) 21, Air Test and Evaluation Squadron (VX) 1 and the Naval Air Warfare Center Aircraft Division's (NAWCAD) Crashworthy and Escape Systems Branch continued flight, ground and lab testing, all of which was completed June 15.

"With flight test completed, the team will continue to tweak the design to incorporate issues learned during test," said Phillip Behrman, integrated product team (IPT) lead of the project. "While the engineering and design teams nailed it on the feature set, component tolerances needed some work.

"Also, based on fleet feedback during test, we learned that we gave the fleet a little too much leg room, so the design team will add



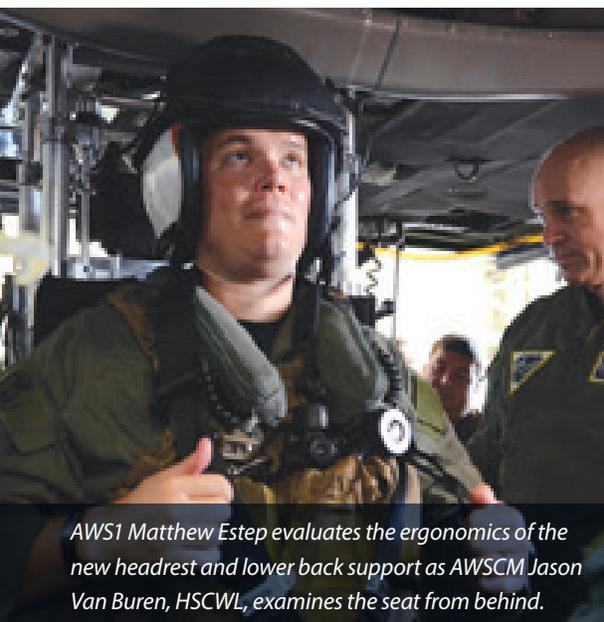
Capt. Dave Padula, Aircrew Systems' program manager, checks out the new harness.



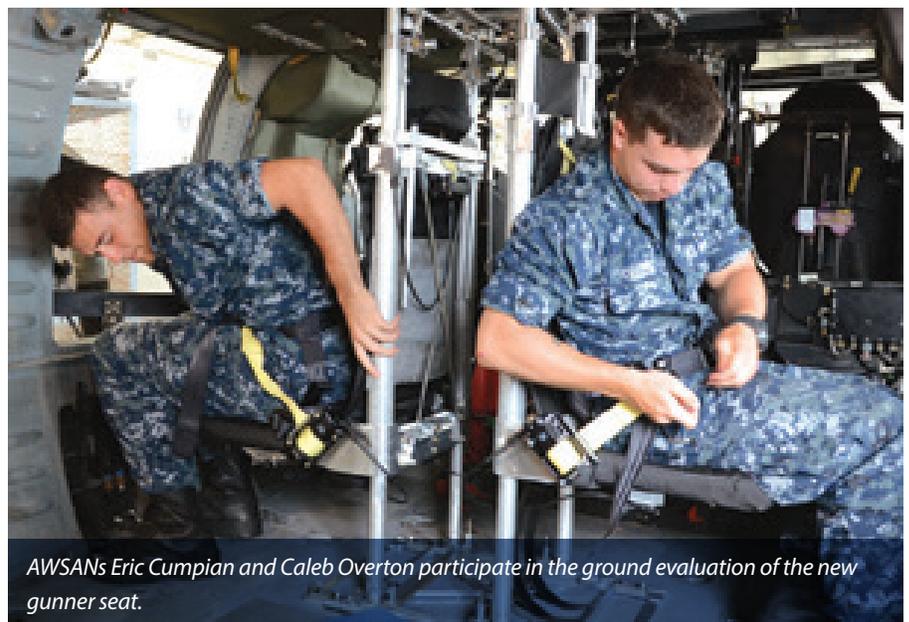
Lindley Bark, Crashworthy and Escape Systems Branch head at Naval Air Warfare Center Aircraft Division, explains the improvements to the new harness to AWSAN Marcus Douglas.



FRS instructor AWS2 Thomas Joyce instructs AWSAN Meriah Romo on the proper method for donning the new harness.



AWS1 Matthew Estep evaluates the ergonomics of the new headrest and lower back support as AWSCM Jason Van Buren, HSCWL, examines the seat from behind.



AWSANs Eric Cumpian and Caleb Overton participate in the ground evaluation of the new gunner seat.

in additional seat movement capability back toward the window.”

Ultimately, the team wants to field a seat that will increase both safety and comfort while improving aircrew mission performance and endurance.

Background

In May 2017, the team got the green light that the effort could commence. Once funding was identified, one of the key organizations tapped to support the effort was NAWCAD's AIRWorks Division.

“AIRWorks is a key component of this effort. They have rapid prototyping capabilities, as well as contract vehicles in place that allowed us to accelerate the effort,” Behrman said.

In addition, a 10-person Gunner Seat Fleet Task Force (GSTF) was created to allow the fleet to provide real-time input during each step of the prototype's development. The GSTF is also a resource the IPT uses to vet ideas, support fit checks and provide the conduit into the gunner community, Behrman said.

In June 2017, the design kick-off meeting was held in San Diego. The effort was supported by the GSTF, Naval Air Systems Command/NAWCAD program team and HSC-3. Most of the features incorporated into PT2 were borne out of that initial design meeting.

Design Challenges

Depending on the mission, the gunner operates the externally mounted gun—or a hoist during search-and-rescue missions—and sits for extended periods of time.

It's a role and an environment to which conventional design standards do not neatly apply. That's why the program office has been working closely with the fleet to determine the optimal dimensions, features and functionality for the new seat, said Lindley Bark, head of the crashworthy and escape systems branch.

"The different occupants' sizes, the mission profiles, the evolutions—what they have to do with the seat is unlike anything you'll find in an ergonomic standard," Bark said. "So we needed to work with them in order to get this right."

In the back of the helicopter's cramped cabin are three seats, two gunner seats and a rear-facing center seat. Working with the H-60 program office, the gunner seat team was able to eliminate the rear-facing seat to free up additional space, allowing the two gunner seats to move farther away from the window, Behrman said.

Next Steps

The team is incorporating design tweaks into an updated drawing package in preparation for the critical design review (CDR). Once the CDR is complete, production representative test articles are expected to be manufactured this fall. Test articles will be put through a rigorous set of environmental and destructive tests, leading to a new round of flight testing.

Once those tests are complete, the program will transition to the production phase, which includes the building of gunner seat kits to support all aircraft and fleet trainers.

An engineering change proposal and technical directive will be developed for incorporation of the new gunner seats into the MH-60S at the organizational level. Initial operating capability is planned for fiscal 2019, when initial gunner seat kits will have been delivered to the fleet.

Written by the Aircrew Systems Program Office. ✈️



Following the Naval Helicopter Association symposium in May, Sailors with HSC-2 in Norfolk had an opportunity to try out the new seat, which includes improvements such as height adjustability, lumbar support, adjustable additional leg room, the ability to recline, a flip-up seat bottom, redesigned restraints, a redesigned headrest to accommodate the night-vision goggle battery, and tracks to allow the seat to move to and from the window.

Osprey Overhaul

Updating the MV-22B Fleet

By Jeff Newman

With the July 10 induction of a second aircraft at a new Boeing facility in Philadelphia, the effort to consolidate the myriad configurations in the Marine Corps' fleet of tiltrotor MV-22B Ospreys is fully immersed in its discovery phase.

After an independent review that found significant impacts to readiness as a result of the 70-plus distinct configurations in a fleet of 300-plus MV-22Bs, the Marine Corps undertook an initiative to upgrade 129 "Block B" Ospreys, which ceased production in 2012, to the standard currently rolling off the line of "Block C" aircraft.

Known as Common Configuration-Readiness and Modernization (CC-RAM), the effort will reduce the number of configurations in the MV-22B fleet to a handful, in hopes of streamlining maintenance times by making repairs more predictable.

Based on the current difference in readiness rates between Blocks B and C aircraft, the program office expects to see a 15-percent improvement in the mission-capable rate of Ospreys that go through CC-RAM, said Col. Matthew Kelly, program manager for the V-22 Joint Program Office.

The independent review concluded in 2016 that the variation among MV-22Bs contributed to an increasing number of non-mission-capable aircraft because of maintenance requirements and supply shortages. The uncertainty maintainers encountered when working on so many different versions of

Ospreys also meant increasing life-cycle support costs and, generally, negative net effects to all aspects of MV-22B sustainment.

Several factors led to the disparate configurations; chiefly, the constant demand for new requirements from the fleet across a decade-plus of combat operations.

"When the fleet says we need this capability right now to support troops in combat, we ramp up and do it," Kelly said.

The differences between configurations are significant, ranging from pieces of hardware—such as weather radar, a new mission computer or even the avionics box—to the placement and function of wiring bundles. Some of the aircraft even have different fuel dump systems.

"There's a lot of different types of things it could be, but they're fairly significant, to the point that when a maintainer opens up the aircraft, he's going to see something different," Kelly said. "It's not a nut here or a bolt there."

Such capabilities upgrades were generally limited to small batches of aircraft coming off the production line, but "you do a number of those over time, and you wind up with subsets of 20 to 40 aircraft that have different things in them, and you end up with a big configuration issue," Kelly said.

There should only be a handful of configurations across the fleet once the 129 Block B aircraft—which accounts for the bulk of the differences—have been retrofitted, Kelly said.

"The idea is to put them in the same squadron. It will never get to the point where the entire fleet is the same configuration, so maybe we have five or six configurations across the entire



An MV-22B Osprey receives an overhaul at a Boeing facility in Philadelphia as part of the platform's Common Configuration-Readiness and Modernization (CC-RAM) initiative, an effort to consolidate the 70-plus aircraft configurations throughout the MV-22B fleet.



Photos courtesy of Boeing

fleet, but each location, each squadron, will have its own configuration, which will be really helpful,” he said.

Once they only have one configuration of Osprey to worry about, maintainers will know what to expect during repairs and can stockpile spare parts, Kelly said.

“When you have a squadron that has the same configuration of aircraft, you have the same technical data, maintenance manuals, troubleshooting procedures, supply chain, kit parts, tools and support equipment,” Kelly said. “When they go out to do troubleshooting or some procedure on an aircraft, they won’t have to wonder what they’re going to find. They won’t mistakenly use the wrong procedure or grab the wrong tool. And when they need a part, they won’t have five different versions to potentially choose from. They’ll know the one part that they need, and they’ll already have it on the shelf.

“Having a common aircraft to support buys you a significant upgrade in readiness.”

Pre-engineering work for CC-RAM began in August 2017, and the first two MV-22s were inducted Jan. 24 and July 10 at the Boeing facility in Philadelphia, which combined the platform’s production line with that of CC-RAM so technicians on both can share engineering expertise as well as tools and equipment.

The two Ospreys are meant to serve as learning aircraft, informing the rest of the CC-RAM program, and should take about the same amount of time to complete, with the first scheduled to be done by summer 2019, Kelly said.

“We’re pleased with the progress that we’ve seen on the first aircraft, and the first couple are meant to help us understand how to most efficiently do this kind of complex modification, where you’re taking 60 to 70 different engineering changes that were designed independently and now doing them all together,” he said.

These lessons will then be applied to the third Osprey, which

will arrive in Philadelphia in January and be used to solidify procedures for the remaining aircraft, which should take significantly less time.

As Boeing technicians continuously refine their process, the goal is to have each CC-RAM aircraft turn around in approximately eight months, with upwards of 20 being completed annually, Kelly said.

Depending on funding and pricing negotiations, the total effort should take about eight years, he added.

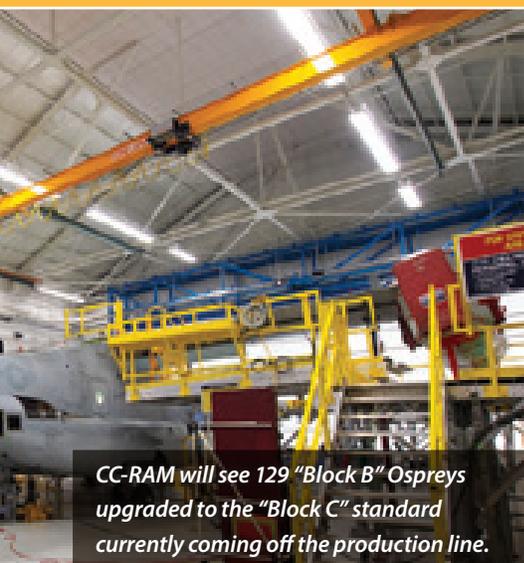
No program has been defined beyond the initial 129 aircraft, but the long-term goal is to ultimately cycle back and upgrade the roughly 200 aircraft that make up the remainder of the MV-22 fleet, Kelly said.

A part of every at-sea Marine Expeditionary Unit and land-based deployment—and soon the Navy’s carrier onboard delivery (COD) platform—MV-22s “are everywhere,” Kelly said. “We are the backbone of Marine Corps self-support, and the Navy has the COD requirements, but we think they’ll probably find some other things that they might want to do with V-22.”

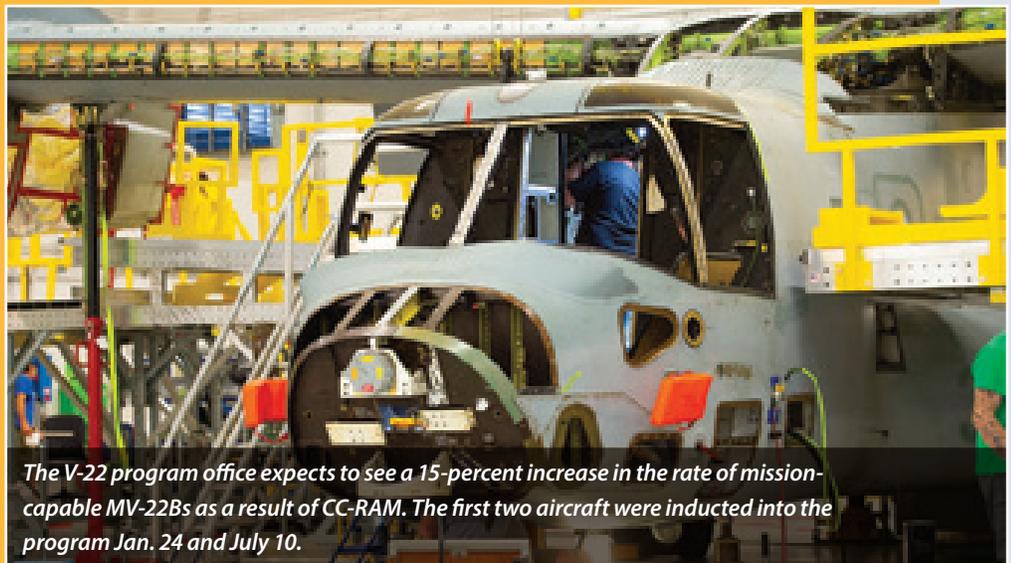
Kelly noted roll-on, roll-off capabilities under development—such as the V-22 Aerial Refueling System—as well as digital interoperability packages that help connect battlefield networks as emerging technologies that will only make the MV-22 more popular in the fleet.

“The V-22 is the most in-demand aircraft in the Department of Defense. We are the lead platform for a number of different capabilities, so the ability for the aircraft to be reliable, maintainable and flyable is paramount,” Kelly said. “Those capabilities don’t mean much if the airplane isn’t ready to go, and CC-RAM is the foundation for V-22 readiness for the next 30 years. Improving reliability while reducing life-cycle costs is going to make this a sustainable aircraft for the next generation of Marine aviators that come fly it.”

Jeff Newman is a staff writer for Naval Aviation News. 🐦



CC-RAM will see 129 “Block B” Ospreys upgraded to the “Block C” standard currently coming off the production line.



The V-22 program office expects to see a 15-percent increase in the rate of mission-capable MV-22Bs as a result of CC-RAM. The first two aircraft were inducted into the program Jan. 24 and July 10.

Marines Use 3-D Printing to Access Replacement Parts Quickly

By Cpl. Stormy Mendez



U.S. Navy photo by MC3 Levingston Lewis

An F-35B Lightning II assigned to the “Green Knights” of Marine Fighter Attack Squadron (VMFA) 121 launches from amphibious assault ship USS Wasp (LHD 1).

Marines with Combat Logistics Battalion (CLB) 31, 31st Marine Expeditionary Unit (MEU), are using additive manufacturing, also known as 3-D printing, to access replacement parts wherever they are needed.

“While afloat, our motto is, ‘Fix it forward,’” said Chief Warrant Officer 2 Daniel Rodriguez, CLB-31’s maintenance officer. “3-D printing is a great tool to make that happen. CLB-31 can now bring that capability to bear exactly where it’s needed most—on a forward-deployed MEU.”

Additive manufacturing uses 3-D printing software to break down a digital model into layers that can be reproduced by the printer, which then builds the model from the ground up, layer by layer, creating a tangible object.

Proving this concept in April, Marine Fighter Attack Squadron (VMFA) 121 flew an F-35B Lightning II aircraft successfully with a part that was supplied

by CLB-31’s 3-D printer. The F-35B had a plastic bumper on a landing gear door wear out during a recent training mission. Though a small and simple part, the only conventional means of replacing the bumper was to order the entire door assembly—a process that’s time-consuming and expensive.

Using a newly released process from Naval Air Systems Command for 3-D printed parts, the squadron printed the bumper, had it approved for use and installed within a matter of days—much faster than waiting for a replacement part to arrive from the U.S.

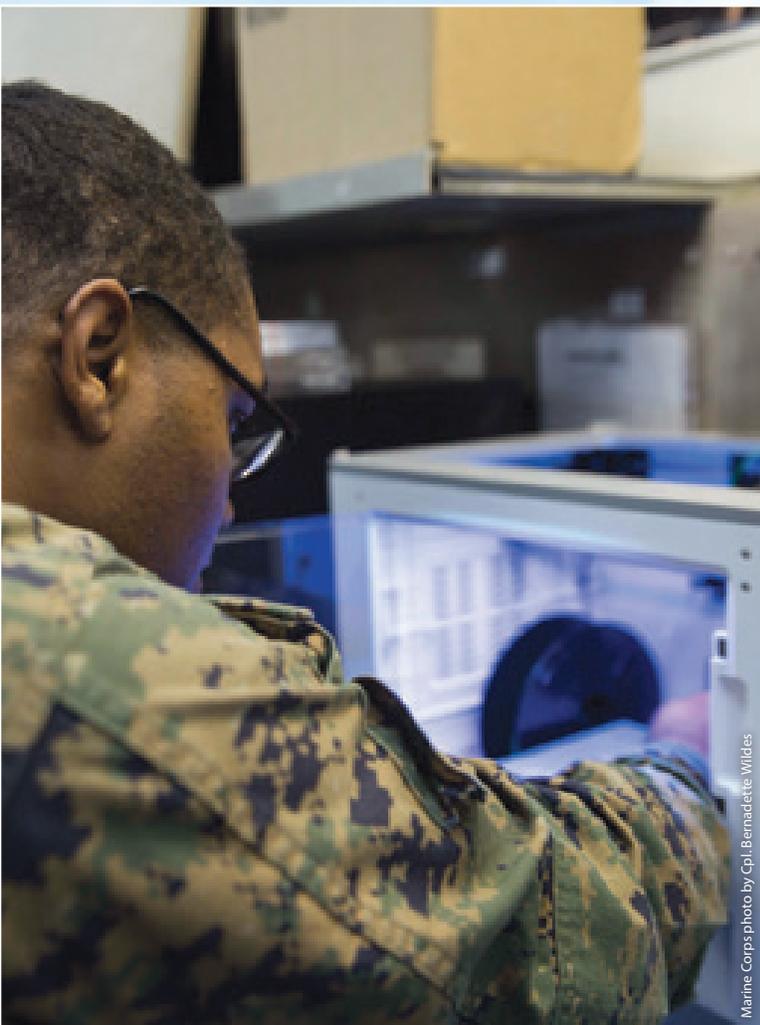
Making further use of 3-D printing, the MEU’s explosive ordnance disposal team requested a modification part that acts as a lens cap for a camera on an

iRobot 310 small unmanned ground vehicle—a part that did not exist at the time. CLB-31’s 3-D printing team designed and produced the part, which is now operational.

The templates will be shared Marine Corps-wide to make them accessible to any unit with the same needs.

3-D Printing is the Future

The Marines deployed here use their 3-D printer as an alternative, temporary source for parts. As a permanently forward-deployed unit, it’s crucial for the 31st MEU to have access to the replacement parts it needs for sustained operations. 3-D printing capabilities dovetail with the MEU’s expeditionary mandate—to deploy at a moment’s notice



Marine Corps photo by Cpl. Bernadette Wildes

Sgt. Adrian Willis, a computer and telephone technician with Combat Logistics Battalion (CLB) 31, prepares to print a 3-D model aboard USS Wasp (LHD 1).



Marine Corps photo by Cpl. Stormy Mendez

Chief Warrant Officer 2 Daniel Rodriguez, a maintenance officer with CLB-31, holds a 3-D printed plastic bumper for an F-35B Lightning II landing gear door while underway aboard USS Wasp.

when the nation calls—because it can't wait for replacement parts shipped from halfway around the world.

Sgt. Adrian Willis, a computer and telephone technician, said he was thrilled to be selected by his command to work with a 3-D printer.

"I think 3-D printing is definitely the future—it's absolutely the direction the Marine Corps needs to be going," he said.

The Marine Corps is all about mission accomplishment and self-reliance. In boot camp, Marine recruits are taught to have a "figure-it-out" mindset, and 3-D

printing is the next step for a Corps that prides itself on its self-sufficiency.

"Finding innovative solutions to complex problems really does harken back to our core principles as Marines," Willis said. "I'm proud to be a part of a new program that could be a game-changer for the Marine Corps."

Time is of the Essence

"As a commander, my most important commodity is time," said Lt. Col. Richard Rusnok, the squadron's Commanding Officer. "Although our supply personnel and logisticians do an

outstanding job getting us parts, being able to rapidly make our own is a huge advantage."

The 31st MEU continues to brainstorm new opportunities for its 3-D printer, such as aviation parts and mechanical devices that can be used to fix everyday problems. Though only in the beginning stages of development, officials said, the 31st MEU will continue to push the envelope of what 3-D printing can do to make the MEU a more lethal and self-sufficient unit.

Cpl. Stormy Mendez is with the 31st Marine Expeditionary Unit. 🦋



Coast Guard aviation maintenance technicians install a leading edge on an HC-130 Hercules aircraft wing.

C-130 READINESS

Navy Learns from Air Force and Coast Guard

By Lt. Cmdr. Christopher Baxter

Commander, Naval Air Force Reserve (CNAFR) has approved the standup of a centralized repair facility (CRF) in hopes of increasing C-130T Hercules aircraft availability and saving millions annually.

The CRF concept should improve C-130 isochronal inspections (ISOs) throughput velocity, with the expected benefit of a 25-percent increase in aircraft availability and more than \$80 million in annual savings to Navy-unique Fleet Essential Airlift customers, consisting of combatant commands, the Fleet Response Plan and DOD logistics customers worldwide.

The decision from Rear Adm. Michael Crane, CNAFR, comes after a benchmarking study of how the Air Force and Coast Guard maintain their respective C-130 fleets.

Commander Fleet Logistics Support Wing (CFLSW) Commodore Capt. Chad Baker commissioned the benchmarking study in mid-2017, with onsite process evaluations performed at Coast Guard Station Elizabeth City, North Carolina, and Air Force Special Operations Command (AFSOC), Hurlburt Field, Florida. CFLSW comprises the Navy's entire medium- and heavy-airlift fleet.

The study found both services employ reliability-centered maintenance (RCM), but in different ways. The Coast Guard divides traditional phased maintenance requirements for the C-130 into dis-

crete tasks on a "maintenance due list" that can be performed independently between flights or in conjunction with unscheduled maintenance, maximizing operational availability for a small fleet that must maintain a high state of readiness for emergencies. Also, instead of performing daily inspections, the Coast Guard opts for weekly checks, reducing maintenance tasks without any apparent safety impacts.

Meanwhile, AFSOC has decreased scheduled inspection requirements significantly by expanding the window between its ISOs. Using a CRF staffed by



U.S. Coast Guard photos by Petty Officer 1st Class Charly Hengen

A Coast Guard aviation maintenance technician conducts maintenance on an auxiliary power unit combustion liner.

contractors at Hurlburt Field, AFSOC performs ISOs four times faster than those conducted by Air Force aircraft custodians.

In contrast, Navy C-130 squadrons operate on an ISO cycle less than half as long as AFSOC's, with a turnaround time more than four times as long. In total, Navy C-130s spend more than five times as many days in schedules maintenance as AFSOC C-130s.

CFLSW is working with Office of the Chief of Naval Operations resource sponsors and the Navy's C-130 program office to fund implementation of the Coast Guard technical directive to prevent longeron—a longitudinal structural component of an aircraft's fuselage—corrosion issues on the Navy's C-130 fleet.

The study also included a tour of the Coast Guard's C-130 Aviation Logistics Center in Elizabeth City, which performs depot maintenance and houses the service's equivalents of airworthiness and fleet support teams. A key insight from

the tour was the center's development more than a decade ago of a \$7,600 kit that has eliminated airframe corrosion and associated periodic inspections in the area of the flight-critical sloping longeron below the aircraft's bathroom. The area has been a recurrent readiness degrader on CFLSW aircraft.

The center also performs more in-depth, standard depot-level maintenance, which takes up to twice as long as the Air Force and Navy's standard 135-day preventative maintenance inspection cycles but allows the Coast Guard's C-130s to operate for four years without major organizational-level phased inspection events.

Other CFLSW initiatives spurred by the benchmarking study include:

- RCM analysis to optimize intervals between Navy C-130 ISOs
- Evaluation of an AFSOC tool that uses an aircraft's estimated time on wing to predict engine failure before its next scheduled ISO,

which facilitates engine changes in conjunction with ISOs in a controlled maintenance environment with maximum support rather than during critical, high-priority missions

- Exploration of partial implementation of a fixer-flyer aircrew man concept in the C-130 community to facilitate expedited fault isolation and readiness recovery during extended missions away from home guard
- Maximized reuse of experienced C-130 personnel to align more closely with Air Force, Coast Guard and Marine Corps detailing practices, where technicians remain on the same platform for their entire careers. This would deepen technical expertise over time and aligns with the vision of retired Vice Adm. Mike Shoemaker, who, as commander, Naval Air Forces, said in April 2017, "It is imperative to the future of Naval Aviation that we develop and retain maintenance, logistic and operational experts within our Navy enlisted ratings, particularly at the journeyman and supervisory (E5 thru E8) levels. While initial training serves as a foundation, true expertise in our complex warfighting systems can only be achieved through the accumulation of years of experience and knowledge in a particular type/model/series." Navy C-130 technicians are currently detailed back to the same airframe less than 38 percent of the time

- Evaluation of micro vanes, which are proven to improve fuel efficiency by approximately 4.3 percent in the altitude range typically used for FLSW C-130 missions

While the Air Force, Coast Guard and Marine Corps are in the midst of multi-year procurements of new C-130Js, the Navy's C-130s—which average 25 years of service and are far more in demand than available—are expected to remain in service through the mid-2020s.

Lt. Cmdr. Chris Baxter was the Readiness and Innovation Officer for Fleet Logistics Support Wing. 🦅

WINCH

HUNT

By Jeff Newman

While trying to cut costs for the CH-53K King Stallion, the Marine Corps' new heavy-lift helicopter platform, the H-53 program office found an obvious solution—the aircraft's cargo winch, which was set to cost \$350,000 each.

With the CH-53K fleet set to number 200 aircraft, the H-53 program office deemed a total cost of \$70 million—not far from the \$87 million it takes to build an entire King Stallion—too rich for a component Marines use sparingly on the current heavy-lift platform, the CH-53E Super Stallion.

In search of a more cost-effective alternative, now-retired Col. Hank Vanderborgh, then-program manager of the H-53 Program Office, asked the Naval Air Warfare Center Aircraft Division's Cargo and Special Operations team what they could come up with.

With a major assist from now-retired Gunnery Sgt. Peter Montalvo, who was mission systems crew chief for the H-53 program office, the cargo team found its solution on an industry shelf—the Warn 1500AC, an \$800 winch capable of pulling 1,500 pounds. Even factoring in additional equipment needed to let the winch run off the King Stallion's auxiliary power—and the expectation it would need to be replaced several times over the helicopter's lifecycle—the winch is still expected to save more than \$60 million, nearly 86 percent of the original winch's price tag.

A Warn 1500AC winches a fully-loaded lightweight tactical vehicle into an MV-22B Osprey on June 20 at the Naval Air Warfare Center Aircraft Division's cargo lab at Naval Air Station Patuxent River, Md.

U.S. Navy photo by Fred Fliegge

Stronger, safer, better. Navy and Marine Corps cargo aircraft currently are equipped with a centerline, hydraulic winch mounted in the forward part of the cabin, near the cockpit, and the initial plan was to install something similar on the CH-53K. The initial plan was to have something similar on the CH-53K.

“The intent was to design a winch that would be permanently installed and never need to be replaced,” said Joe Holman, a mechanical engineer with the cargo team and lead on the winch project. “Instead, we’re scaling down to the Warn 1500AC, which is an off-the-shelf, consumable part, and when it dies, we can replace it.”

The team has made no major modifications to the 1500AC, other than replacing its 3/16-inch steel cable with a 3/16-inch synthetic rope.

“We’re trying to move away from steel cable,” Holman said, explaining that when a steel cable pulls something and snaps, energy stored inside the cable releases and creates a dangerous whipping action.

“When synthetic rope breaks, all the fibers just snap back in line. It doesn’t have the same whipping motion, so it’ll be a huge benefit in safety for the guys in the fleet,” he said.

The synthetic rope also proved stronger in testing, breaking at about 6,000 pounds, whereas the steel cable broke at 5,500 pounds.

Though synthetic rope comes standard on many newer commercial winches, Holman said, to his knowledge, this is the first time a military winch will use anything other than steel cable. Accordingly, the cargo team is working on a standard that will inform Marines of the characteristics of synthetic rope and how to inspect it.

“It’s always been steel cable for everything, so there’s actually no military standard for synthetic,” Holman said. “That’s how new this concept is for military applications.”

Meant to be mounted on vehicles or trailers, the 1500AC operates at a standard 60 hertz. Aircraft operate at a much higher 400 hertz, so the winch will be delivered to the fleet as part of a kit that will include a frequency converter and power distribution unit, which will plug into the aircraft’s utility receptacle and power the entire unit.

The three components will be mounted onto a plate that can be moved around the aircraft

and secured using standard cargo straps. A fabrication shop at Naval Air Station (NAS) Patuxent River, Maryland, will manufacture the plates.

At 44 pounds, the relatively light kit can be moved around the cabin, giving Marines much more flexibility when loading cargo, Holman said. Currently, if Marines need to winch something into an aircraft that’s already loaded with cargo, they use snatch block pulleys to wrap the winch line around any obstructions. But with the Warn winch, Marines can move and secure the plate in front of any existing cargo.

“The concept behind the plate is giving the fleet flexibility with where they can position the winch. It’s only ever been a centerline, floor-mounted winch,” Holman said.

In addition, the move to an electric winch has allowed for removal of the hydraulic lines that were going to power the original winch, reducing the CH-53K’s weight.

The Aircraft Prototype Systems Division at NAS Patuxent River made three kits for qualification testing over the summer, which will determine how often the winch might need to be replaced over the life of the King Stallion. Whatever the results of that testing, Holman said he was confident it will prove to be far more cost effective than the current winch design.

The cargo team’s initial estimate is that the Warn winch will need to be replaced every 100 cycles at max load. Since the original winch was supposed to last 1,000 cycles—a requirement meant to last the life of the aircraft—Holman figures each Warn winch would ultimately need to be replaced 10 times.

“That’s just for the winch itself, which is the cheapest part of the whole assembly,” said Tim Reese, the CH-53K program’s deputy integrated product team lead for mission systems, landing gear and airframes.

Plus, not everything winched into an aircraft constitutes a max load, Holman noted.

“The estimates that we provide to the program office are going to be very conservative, assuming that every time I pull something into the aircraft, I’m maximizing the capability of this winch, which is not going to happen,” he said. “But that’s the current estimate—that I can make this winch last at least 100 cycles.”

Another four prototypes will be made for initial operational test and evaluation next year, after qualification testing is complete, Holman said.



U.S. Navy photo by Emanuel Cavallaro

A commercial winch meant to be mounted on vehicles or trailers, the Warn 1500AC has a 1,500-pound pulling capacity and will be mounted on a plate that can be moved around a CH-53K King Stallion’s cabin, giving Marines more flexibility when loading the aircraft.

'I promise you it's going to work.'

The idea for a scaled-down winch originated in 2014 with the cargo team's initial demonstration of the V-22 Osprey as an option for at-sea delivery of an F-35 Lightning II engine's power module. During the demonstration, the team used a handheld winch called the PullzAll, another Warn product, to pull a representative skid into a V-22.

"We had one in the front and one in the back, and we maintained positive control over the module as it was coming inside the aircraft, and that's what started everything," Holman said. "We wondered, 'Why can't we just use these in the 53K?'"

But with a capacity of 1,000 pounds and line that only extends 15 feet, the battery-operated PullzAll didn't pass muster as a fully capable cargo winch. Nonetheless, CH-53K squadrons will receive them in addition to the Warn 1500AC kits, giving fleet Marines a winch to use when the aircraft is shut down.

"Those will be handy if the fleet has to go somewhere; after they land and shut down the aircraft, they can use those without having to start up the auxiliary power unit," Reese said. He estimated each CH-53K squadron will receive about 20 of the 1500AC kits and 10 PullzAlls.

After zeroing in on the Warn 1500AC, Holman and Montalvo visited Marine Aviation Weapons and Tactics Squadron (MAWTS) 1 in Yuma, Arizona, to get fleet feedback. They were able to secure time on a CH-53E, and a group of Marines gathered to watch them load various pieces of ground support equipment.

Holman recalled a crew chief's

"The cargo team's initial estimate is that the Warn winch will need to be replaced every 100 cycles at max load. Given that the original winch was supposed to last 1,000 cycles—a requirement meant to last the life of the aircraft."

doubts that a winch capable of pulling 1,500 pounds could move a 7,000-pound hydraulic cart, the heaviest piece of equipment at the demonstration. But Holman was unfazed.

"I said, 'I promise you it's going to work,' and I showed him the math," he said.

The winch pulled in the cart without difficulty, stunning the crew chief.

"The misconception is that the weight of the cargo or vehicle equates to the amount of load being put into the rope, and that's not the case," Holman said. "A line pull of 1,500 pounds equates to pulling a vehicle between 4,000 and 5,000 pounds up an 18.5-degree ramp. And once you use a snatch block and effectively double the winch's strength, now you can pull a 10,000-pound vehicle up that ramp."

Noting that the CH-53K is restricted to 10,000 pounds of internal cargo, the Warn 1500AC winch—with the help of a pulley—will be able to pull in anything that can physically be transported inside a King Stallion, said Mike Jackson, a mechanical engineer with the cargo team.

Holman said some Marines have voiced concerns the Warn 1500AC spools in more slowly than the winches currently on the CH-53E and MV-22B, but ultimately they prefer the new winch for its relative simplicity. The current winches "have a lot of intricate, little micro switches that you have to adjust for the winch to work, or even spool out and back in," which can make them frustrating for fleet Marines to operate, Reese said.

"The line speed of the 1500AC is slower than the previous winch, but it gives the fleet a lightweight, mobile solution that can be used to support the mission at hand, and at the end of the day, it's a better option than pushing cargo in yourself," Holman said.

In some cases, slower might even be better. Jackson said the winch would end up having a "big impact" in the V-22 community, which has expressed interest in the winch project to load tactical vehicles by driving them in, only to have the tires slip on the loading ramp and hit the longerons.

"It's going to be a training and paradigm shift," Jackson said. "It's going to take more time, but it's usually not a fast effort when you're winching something. It's not going to slow down your day that much. Take the extra two minutes, and you'll be fine."

Jeff Newman is a staff writer for Naval Aviation News. ✈

In order to be compatible with the CH-53K's power system, the winch will come packaged with a frequency converter (beige box in the rear) and power distribution unit (black box in the middle). All three components will be mounted on a plate, with the entire assembly expected to weigh 44 pounds.



U.S. Navy photo by Emanuel Casalbano

FRCSW Upgrades Its Environmental and Safety Standards

By Jim Markle

Fleet Readiness Center Southwest (FRCSW) recently upgraded its environmental and safety management standards to emphasize its commitment to improving performance.

Intertek, an international company that certifies compliance independently with the International Organization for Standardization (ISO) and British Standard (BS), audited FRCSW and issued both certifications in June.

Environmental Management System

FRCSW follows the ISO 14001 standard for its environmental management system (EMS) and was upgraded from the ISO 14001:2004 standard to ISO 14001:2015. The 2015 standard requires continual improvement, and performance is measured and reported to management.

“Top management now owns the whole system, which is a big change between the 2004 and 2015 standard. So, there’s a lot more buy-in at all levels within the organization,” environmental engineer Shelli Craig said.

Other changes in the 2015 standard expand the EMS coverage and scope and require interactions with external parties, new documentation, legal compliance and operational control.

To certify the upgrade, auditors examined three years of data for all work shifts and looked for indications of continual improvement over that period. They found FRCSW met all its goals.

FRCSW became the first federal facility to adhere to ISO 14001 when it established its EMS and registered to the environmental standard in 1999.

“The EMS is required in a lot of Navy installations, but it is Commander, Fleet Readiness Centers (COMFRC) who is asking us to maintain our EMS to that 14001 standard,” Craig said.

The EMS encompasses six different programs, including air, water and pollution prevention. Four environmental protection specialists monitor the EMS in 20 command locations.

EMS extended staffing includes approximately 30 material management specialists with environmental collateral duties, 10 environmental representatives, 17 members of the Environmental Program Office and six chemical handlers who collect and dispose of hazardous waste.

“Our facility gets continued and repeated high marks for housekeeping,” Craig said. “This is a hugely meaningful strength in that the corners are clean, there’s no hazmat all over the place, and trash and hazardous wastes are clearly labeled, marked and separated. Good housekeeping speaks to many overlapping areas and gives auditors a sense of a tight ship.”

Safety Management System

Formed in 2014, FRCSW’s safety management system (SMS) ensures certification and conformance to the BS Occupational Health and Safety Assessment Series 180001 standard.

“For the certification, we needed to prove to them with audits, metrics, graphs and documentation that we are doing exactly what we say we are going to do,” occupational health and safety specialist Chris Gibson said.

The SMS has three primary components:

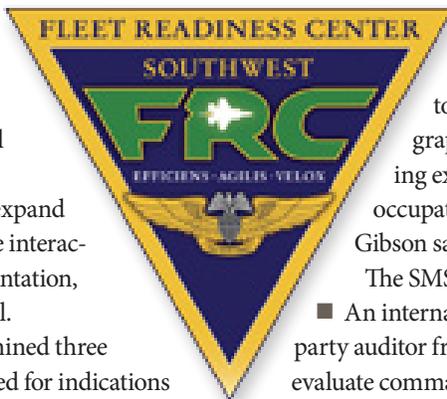
- An internal audit group, which includes a second party auditor from National Technology Associates to evaluate command spaces
- An implementation team comprised of wage-grade employees, managers, supervisors and the same top-level managers who oversee the EMS
- A third-party auditor to verify and authenticate the standard

The SMS established the criteria used in its internal audit.

“When we meet these criteria, we report up to COMFRC and advance through one of three levels. We’re currently at the bronze level,” Gibson said. “We have about 30 people who manage various FRCSW buildings. They are called ‘champions.’ They meet with the safe-site leads, who are often wage-grade employees that serve as shop safety representatives as a collateral duty.”

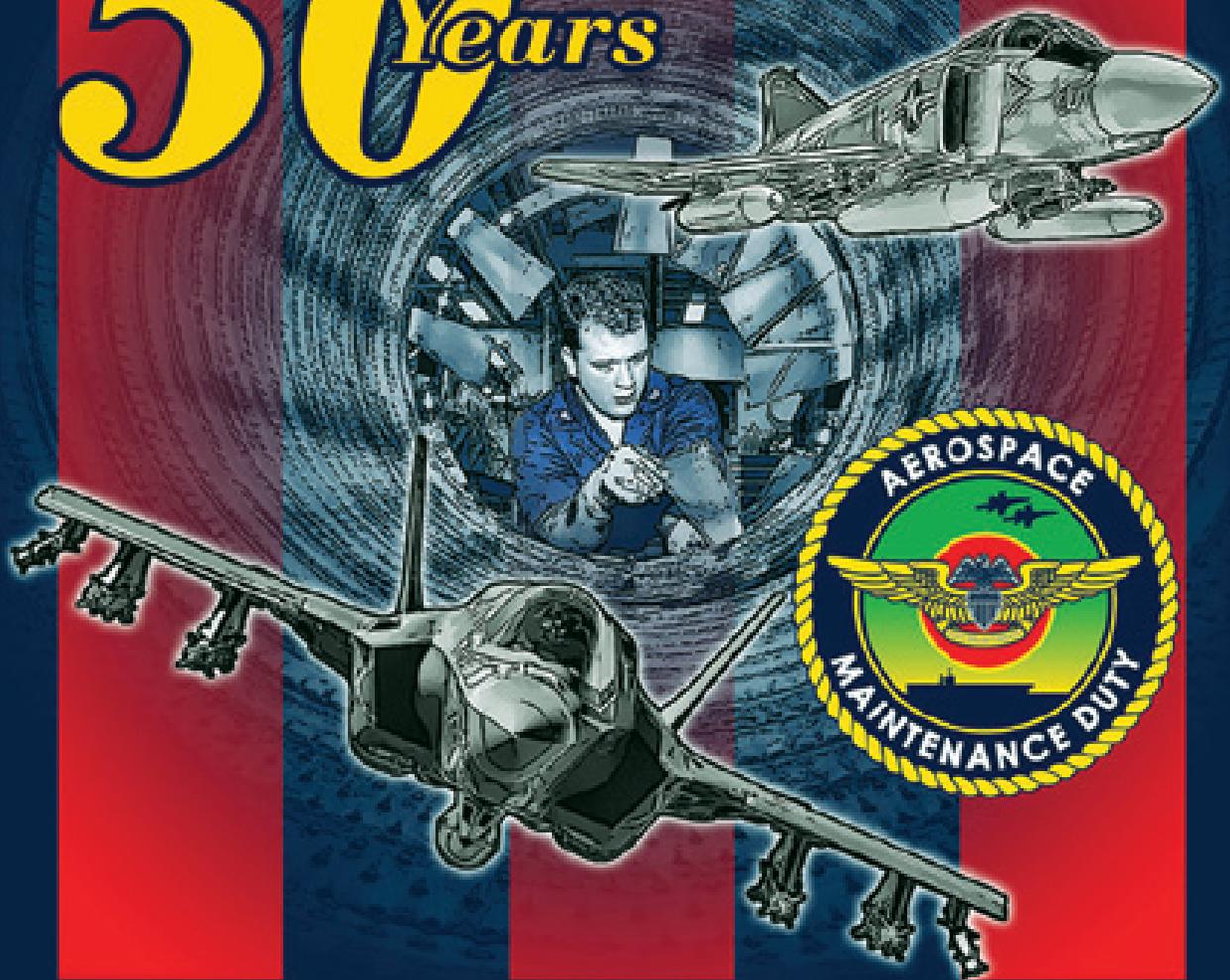
A successful SMS or EMS and standard conformance both rely on employee compliance within their daily operations, Gibson said.

Jim Markle is a public affairs specialist at Fleet Readiness Center Southwest. 



Aerospace Maintenance Duty

50 *Years*



1968 - 2018

AEROSPACE MAINTENANCE PROFESSIONALS FOCUS ON IMPROVING READINESS

By Gary Younger

More than 300 aviation maintenance professionals gathered May 13-15 in Virginia Beach, Virginia, to discuss ways to improve fleet readiness and keep more aircraft and components available for tasking.

Discussions covered readiness and modernization initiatives, training improvements, facilities and equipment upgrades, ways to build more quality into parts to minimize maintenance and replacement, and building closer relationships between logistics and supply commands.

“When most people think of Naval Aviation, they think of aviators and naval flight officers,” said Rear Adm. Mike Zarkowski, commander, Fleet Readiness Centers, as he kicked off the symposium. “We, the aerospace maintenance professionals, are the ones who keep the aircraft flying. We fix for the fight, day in and day out.”

With reduced flight hours attributed in part to tight budgets, he said maintenance personnel are not getting the opportunity to work on aircraft as often as they should to perfect their skills. The recent budget approved by Congress will allow more flight hours for pilots and crews. Maintenance professionals will, in addition, be able to work on aircraft more often to increase their experience with the aircraft, components and parts.

Rear Adm. Mark Whitney, director of Fleet Maintenance, U.S. Fleet Forces Command, challenged leaders to be innovative and creative in finding solutions to improve readiness.

“The challenge for leadership is to make status quo more dangerous than the challenge of trying something new,” he said.

One innovative idea offers virtual training at the Fleet Readiness Centers to allow artisans to experience the look and feel of painting aircraft without the expense or potential damage.

Attendees agreed that a vital part of an effective maintenance program is a well-functioning supply system.

Guest speakers Air Force Brig. Gen. Linda Hurry, dual-hatted as commander, Defense Supply Center Richmond and Defense Logistics Agency (DLA) Aviation, Richmond; and Rear Adm. Duke Heinz, Naval Supply Systems Command Weapons System Support, spoke about their commitment to ensuring their teams work closer together so parts and supplies are available when and where needed.

“Adm. Heinz and I are joined at the hip and the key to our success is to make sure we are linked and synched, and we understand collectively what your requirements are,” Hurry said. “Our goal, at least from a DLA perspective, is that we will try new things [to improve support]. If it’s not illegal, immoral or too terribly fattening, we’re going to try it.”

The symposium also included panel discussions and mentoring sessions with retired flag officers and senior aviation maintenance leaders.

Gary Younger is a public affairs specialist supporting Commander, Fleet Readiness Centers. ✈️

AEROSPACE MAINTENANCE COMMUNITY CELEBRATES 50 YEARS OF SERVICE

Although the Aerospace Maintenance Duty Officer (AMDO) community has only been around for five decades, its history has been intertwined with Naval Aviation for more than a century.

Shortly after pilot Eugene Ely launched his Curtis Pusher off the deck of USS Birmingham (CL-62) more than a century ago, the Navy recognized the value of bringing aircraft to the fight.

“Keeping that aircraft flight-worthy and ready to launch became an instant requirement,” said Rear Adm. Mike Zarkowski, commander, Fleet Readiness Centers and senior AMDO, as he opened the 2018 Aerospace Maintenance Professional Symposium (AMPS) in Virginia Beach, Virginia, May 13-15. “Once the Navy embraced the idea of launching aircraft from ships, there was no turning back.”

From the wood and fabric open-cockpit fighters to the fifth-generation F-35 Lightning II, Naval Aviation has progressed, and with it, aviation maintenance has kept pace.

Before World War II, the senior aviation chief maintenance mate ran every aspect of the squadron maintenance program, which was largely self-developed and passed down from chief to chief. He answered to the commanding officer and managed his own supply bins. Success or failure depended on his maintenance program, since squadrons were more or less self-supporting.

During and after World War II, aviation maintenance management became more centralized as planners understood more about maintenance and its impact on aviation. Regulations, instructions and manuals were produced to provide more guidance to maintainers. The standardized Naval Aviation Maintenance Program (NAMP) was instituted in 1961 and detailed the responsibilities of the organizational- and intermediate-levels of maintenance.

Before the standup of aviation maintenance as a career field, consistency of aviation maintenance varied from squadron to squadron. In the 1950s and 60s, various CNO-directed studies identified a

“Ask any AMDO why their community is important, and you’ll hear how it drives Naval Aviation’s readiness to fight now and in the future.”

need for an officer corps dedicated to providing full-time, professional aircraft maintenance. These studies came from a growing concern that new generations of sophisticated and expensive weapon systems being introduced to the fleet would pose reliability and maintainability problems to Naval Aviation’s operational readiness and safety.

In July 1968, several professional maintenance officers, including Capt. Howard Goben and Cmdr. Virgil Lemmon, lobbied the Secretary of the Navy to establish the AMDO community with designator 152X. In December 1968, the “original 100” AMDOs, five of whom attended AMPS, were selected from the ranks of naval aviators, general aviation, aviation limited duty and aeronautical engineering duty officers, to become the nucleus of the AMDO community. The first 100 officers included 47 lieutenants, 43 lieutenant commanders, nine commanders and one captain, and the AMDO community now boasts more than 400 active members and continues to grow.

In 1969, transfer boards began transitioning

qualified, fleet-experienced officers into the AMDO community, and entry-level AMDOs began entering from the U.S. Naval Academy, Aviation Officer Candidate School, Officer Candidate School, Reserve Officers Training Corps and unrestricted line communities.

AMDO Community Achievements

Since its inception, the mission of the AMDO community has been to help guide the development, establishment and implementation of maintenance and material management policies and procedures to support naval aircraft, airborne weapons, attendant systems and related support equipment.

Ask any AMDO why their community is important, and you’ll hear how it drives Naval Aviation’s readiness to fight now and in the future.

Over time, AMDOs have matured the NAMP from its initial body of unintegrated policies and processes in the late 1950s, to its first formal release in 1961, to development of

today’s Naval Aviation maintenance standard operating procedures.

In 1966, CNO Adm. David McDonald approved a new aircraft maintenance and material management manual creating “three levels of maintenance,” and this new “3M” system was implemented. The seeds were planted for an Aircraft Intermediate Maintenance Department (AIMD) aboard all aircraft carriers, and AMDOs played a critical role in helping CNO establish them in 1967. That same year, six Navy and Marine Corps Overhaul and Repair Departments were re-designated as separate commands called Naval Air Rework Facilities or NARFs—precursors to today’s Fleet Readiness Centers (FRC).

The current FRC structure—which includes four depot maintenance sites, four intermediate maintenance sites and a headquarters command—was a result of the 2005 Base Realignment and Closure Commission recommendation that realigned and merged depot and intermediate maintenance activities.

On Nov. 13, 2008, AMDOs marked a historic moment when the Professional Aviation Maintenance Officer warfare pin was approved, and again on Dec. 9, 2009, when the first AMDO, Rear Adm. Mike Bachmann, was pinned.

For more on the AMDO history, visit www.amdo.org. 🚀



U.S. Navy photo

Five of the original 100 AMDOs receive Professional Aviation Maintenance Officer (PAMO) pins during the 2018 Aerospace Maintenance Professional Symposium in Virginia Beach, Va., May 13-15. Rear Adm. Mike Zarkowski, commander, Fleet Readiness Centers, left, and Capt. Keith Nixon, commander, FRC Mid-Atlantic, right, celebrate aviation maintenance pioneers by making them honorary PAMOs. From left are retired Lt. Cmdr. Jack Jeffords, Capt. Tom O’Connor, Capt. Don Taggart, Capt. Vern Listol and Capt. Mack Prose.

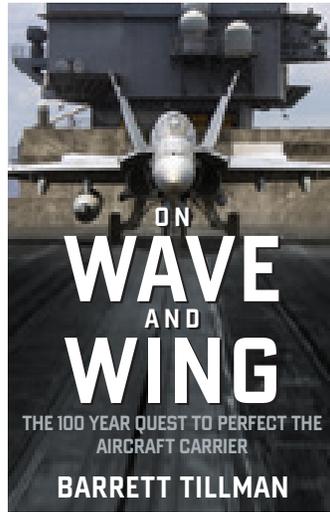
Professional Reading

By Cmdr. Peter Mersky, USNR (Ret.)

On Wave and Wing: The 100-Year Quest to Perfect the Aircraft Carrier

By Barrett Tillman

Regnery Publishing,
Washington D.C. 2017



In this period of centennial observances, we have seen quite a few books published on the development of Naval Aviation from its early years of the 20th century into the incredible force it has become.

In “On Wave and Wing: The 100-Year Quest to Perfect the Aircraft Carrier,” respected aviation historian Barrett Tillman gives his own take on the subject, writing in his knowledgeable and occasionally acerbic style, lacing the facts and dates with his strong opinions on events and the personalities that helped create them. A new book by Tillman is always an event, and this one is no exception.

He begins with a lengthy discussion of the early British experiments in launching and recovering aircraft from ships. Those experiments took place at the same time the U.S. was pursuing the same endeavor, mainly in the form of two

US Navy F-4 Phantom II Units of the Vietnam War 1969-1973

By Peter E. Davies, Osprey Publishing, UK. 2018

Peter Davies has written many books for Osprey Publishing, including quite a few dealing with the F-4 Phantom in Vietnam. His new book, “U.S. Navy F-4 Phantom II Units of the Vietnam War 1969-1973,” continues the story he started in his previous work on the F-4 in Vietnam from 1964 to 1968.

This latest book’s appearance more than two years after that first volume (published in 2016), shows how much work goes into writing these great little books. It might be one of his best.

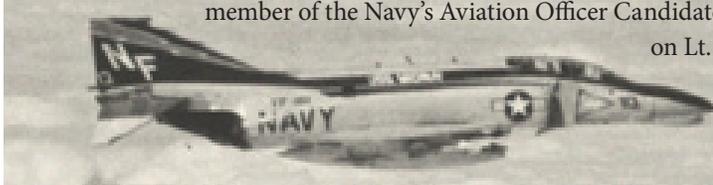
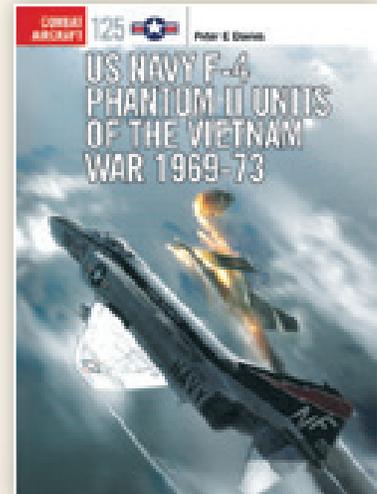
Beginning with an excellent description of the early war years, Davies chronicles how Navy Phantom crews dealt with the North Vietnamese MiG force, a deceptively simple but complicated setup involving outdated but still potent MiG-17s paired with more sophisticated MiG-21s, including the latest MF model, which first appeared in 1972.

The descriptions in this book of the operation of the F-4’s missile and radar capabilities when fighting MiGs are among the most technical I have seen. They should elicit new respect and provide a greater understanding of the teamwork between the fighter’s pilot and radar intercept officer.

I also have never seen described in such detail the complicated train of events of May 10, 1972, when U.S. fighter aircraft shot down 11 North Vietnam MiGs and U.S. forces lost two Air Force F-4s and two U.S. Navy aircraft during that war’s most intense day of air-to-air combat. This new research should serve as a reference for historians and enthusiasts alike.

Scottish artist Gareth Hector’s usual stunning cover illustration was of particular interest to this reviewer as it shows the last MiG kill of the war on Jan. 12, 1973, when a VF-161 Phantom crew shot down a MiG-17. The pilot of the F-4 was a fellow member of the Navy’s Aviation Officer Candidate’s School Class 10-68. Hector’s piece places the viewer right on Lt. Victor Kovaleski’s port wing, at about the high seven o’clock position.

The book’s folio of side drawings also puts Jim Laurier’s traditionally fine profile work on full display. ✈️



milestone flights by Eugene Ely in 1910 and 1911, but the U.S. cared little about aviation in those days, giving European aviators the initial lead.

The sequence of growth during World War I dramatically illustrated how very far behind the U.S. was. Tillman then moves into the post-war period when the first true aircraft carriers appeared, with the U.S., Great Britain and Japan leading the way. Although Tillman's facts come from previously published sources, the style and opinions are strictly his.

At times, the book becomes a battle history of the aircraft carrier, with the

author incorporating anecdotes and glimpses of the individuals involved in each event, but he always gives us a fresh mini-history of the carrier war in the Pacific and the Atlantic.

The writing is more than just another date-by-date history of regurgitation of battles. Tillman brings his own characteristic prose to the material that's usually hard to fault and unique in its presentation.

The chapter on World War II is quite long, and it merges into another a succession of conflicts, including those in Korea and Vietnam, along with a much

abbreviated description of late wars in southwest Asia and the Middle East.

As he approaches the modern era, Tillman's descriptions become more brief, describing operations in Southwest Asia and problems with finding replacements for existing, veteran aircraft such as the A-6 Intruder, which had served so long and well from Vietnam to Desert Storm.

The book concludes with a few short appendixes listing famous carrier personalities who went on to other accomplishments and classic movies about carriers. ✈️

Brewster F2A Buffalo and Export Variants

By Richard Dann and Steve Ginter, Steve Ginter, Simi Valley, California, 2017

Naval Aviation and World War II historians love to argue the merits of the Navy's first monoplane fighter aircraft, the Brewster F2A Buffalo, debating the question of just how good—or bad—the tubby little fighter was. From the American point of view, it was really a disaster.

The aircraft was very maneuverable, and its huge greenhouse canopy presented its pilot an excellent view, but it was under-armed and its underpowered engine afforded its pilots little protection in a dogfight. It was also equipped with the weakest landing gear of any front-line fighter of that period.

As authors Richard Dann and Steve Ginter note in their new book, "Brewster F2A Buffalo and Export Variants," the Buffalo nonetheless saw its share of action with the Navy and Marine Corps as well as with the aviators of Britain's Royal Air Force (RAF), the Dutch and most especially the Finns, who boasted a number of Buffalo aces during their war against the Soviet Union.

The 104th entry in Ginter Books' long-running Naval Fighter series, this book features a large compendium of photos, drawings and technical data along with interviews with pilots. On its back pages, the book includes the series regular model kit coverage, discussing several model

kits of the Buffalo, including a large 1/32 scale kit from Czechoslovakia.

The text is rich with detail, including initial aircraft assignments in the Navy, but the photos and captions also offer rare insights. One example concerns the large gun camera mounted in a bracket on the right side of the fuselage

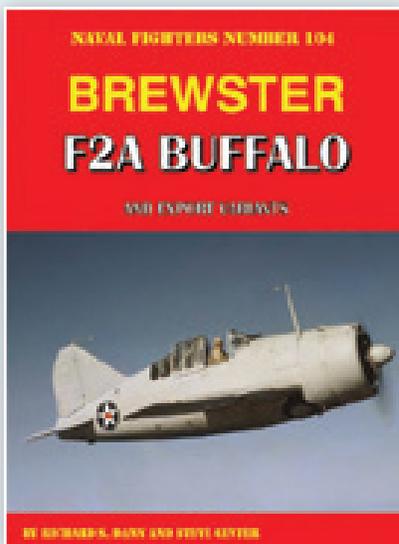
just ahead of the cockpit. Seldom seen in photos, this bulky device must have been very cumbersome and probably used only once in a while.

Besides covering the aircraft's service with the Finns, the work also devotes coverage of the aircraft's service with the Belgians, the Netherlands East Indian Air Force, and chronicles how the RAF used the export Buffalo in their very brief and ultimately very unsuccessful wars against the Germans and Japanese.

The hard-pressed RAF had a rough time handling the Japanese bombers and their fighter escort over Burma. Sometimes partnered with the Flying

Tigers and their P-40s, the British gave a fairly good account of themselves in 1942 until overwhelmed.

All of these countries' time with the Buffalo is briefly but well described in this work, which I must say is one of the best overall histories of the Buffalo I have seen. ✈️



Chief of Naval Operations Professional Reading Program

Warfare is a violent, intellectual contest between thinking and adapting adversaries. The team that can think better and adapt faster will win. As we prepare for operations and war with an increasingly complex set of potential adversaries, we must do more to sharpen our thinking, learn the lessons from history and expand our minds.

The books on this list are those that have influenced my leadership development. It is our responsibility as leaders to continue to grow and to always question the status quo. These books have helped me do just that. If you find just one book on this list that challenges you as a leader, then it has been a success. I encourage you to discuss what has challenged you as a leader in our new forum. Remember never to stop striving to expand your mind.

—Chief of Naval Operations Adm. John Richardson

THE CANON

These books comprise core knowledge that is fundamental to the naval profession. Understanding the causes of conflict, the dynamics of power, and the intersections of politics, diplomacy, economics, and military power is part of the core knowledge each Sailor should have.

CORE ATTRIBUTES

Four core attributes of our professional identity will serve as guiding criteria for our decisions and actions. If we abide by these attributes, our values of honor, courage and commitment should be clearly evident in our actions.

NAVAL POWER

Books classified under Naval Power provide a strong foundation of knowledge on classic and modern maritime strategy, emerging issues and new threats and opportunities. Historical works in this category span the Age of Sail

to the many naval battles of World War II and beyond; studying the history of Naval Power deepens the context and offers precedent for the challenges of the present.

FAST LEARNING

Creating a learning environment, from the deck-plates to the Pentagon, is critical to the success of our fleet. Applying the best concepts, techniques and technologies accelerates learning for individuals, teams and organizations. Clearly knowing the objective and the theoretical limits of performance comes through practice and education. We must adapt processes and thinking to be inherently receptive to innovation and creativity.

NAVY TEAM

We are one Navy Team—composed of a diverse mix of active duty and reserve Sailors, Navy Civilians, and our families—with a history of service, sacrifice and success.

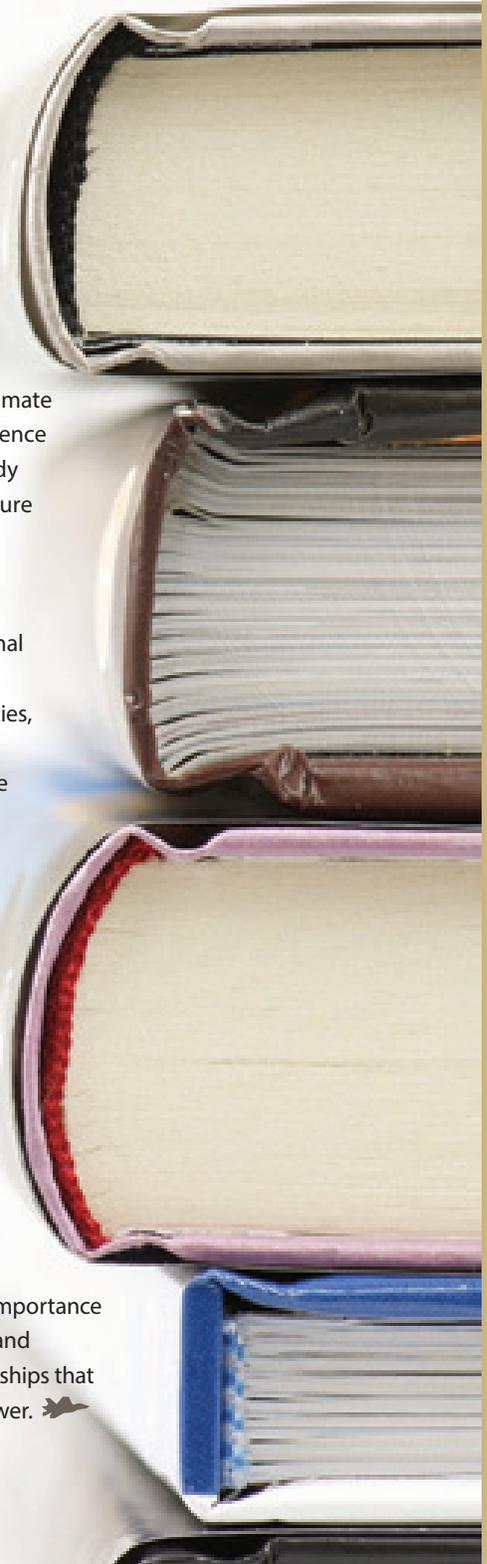
We will build on this history to create a climate of operational excellence that will keep us ready to prevail over all future challenges.

PARTNERSHIPS

Deepening operational relationships with other services, agencies, industry, allies and partners who operate with the Navy to support our shared interests make the Navy a stronger organization. Furthermore, joint and combined partnerships fundamentally strengthen warfighting capacity. These books illustrate the importance of forging domestic and international partnerships that strengthen naval power. 

For more information, visit:

http://www.navy.mil/ah_online/CNO-ReadingProgram/index.html





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