

# NAVAL AVIATION NEWS

THE FLAGSHIP PUBLICATION OF NAVAL AVIATION

## THE UNMANNED ISSUE



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- ▶ **X-47B Unmanned Refueling**
- ▶ **MQ-4C Triton Promises 'Persistent Picture'**

SUMMER 2015



*A P-3C Orion maritime patrol aircraft belonging to the “Golden Eagles” of Patrol Squadron (VP) 9 receives one last pre-flight inspection March 27 before flying to the Aerospace Maintenance and Regeneration Center (AMARG) 309 at Davis-Monthan Air Force Base in Tucson, Ariz. To read more about the sunsetting P-3C aircraft, turn to page 40.*

U.S. Navy photo by MC3 Amber Porter

# NAVAL AVIATION NEWS

SUMMER 2015

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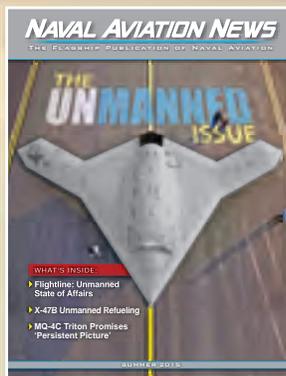
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## ON THE COVER



In the span of four days in April, the U.S. Navy marked major testing milestones for two of its future unmanned platforms. The MQ-4C Triton maritime surveillance aircraft began in-flight radar testing at Naval Air Station Patuxent River, Md., April 18, and four days later, the X-47B demonstrator became the first unmanned aircraft to refuel midflight. Both achievements came on the heels of comments made by Secretary of the Navy Ray Mabus on the importance of unmanned systems to the future of naval warfare. Together, these developments drove the theme of this issue. In separate feature articles, we delve into the complexities of the X-47B's aerial refueling on page 20, and examine how the Triton's airframe and suite of sensors will combine to bring unprecedented surveillance capability on page 24. (Cover photo courtesy of Northrop Grumman)

**On the Back Cover:** Sailors from the future Gerald R. Ford (CVN 78) walk the ship's flight deck following the first "dead-load" test of the ship's Electromagnetic Aircraft Launch System (EMALS) on June 5 in Newport News, Va. Ford completed two successful dead-load launches on the initial test day. Read about the testing on page 16. (U.S. Navy photo by MC1 Joshua J. Wahl)

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Two F-35C Lightning II aircraft from Strike Fighter Squadron (VFA) 101 are parked between two F/A-18F Super Hornets at Naval Air Station Lemoore, Calif., as part of a static display event April 14. The event gave community members an opportunity to see the F-35C aircraft up close. Read more about the first detachment visit on page 13 in *Aircoop*.

U.S. Navy photo by Lt. Cmdr. Darin Russell



## Unmanned State of Affairs

Rear Adm. Mark Darrah, Program Executive Officer for Unmanned Aviation and Strike Weapons

**The Navy's leader in unmanned aviation and strike weapons talks about the technology, priorities and strategy behind the rapidly growing force of the future.**

### The new normal

Today we are operating unmanned systems all over the world. Small tactical unmanned aircraft systems (UAS) like Wasp, Puma, Raven and Scan Eagle are supporting combat operations across multiple areas of operations. A larger class of unmanned systems, the MQ-8B Fire Scout, is operating alongside the MH-60R Seahawk helicopter as a composite manned/unmanned detachment aboard a deployed Littoral Combat Ship (LCS). Meanwhile, the Navy's largest UAS, the MQ-4C Triton currently in development, will work in tandem with the P-8A Poseidon to generate never-before-seen levels of maritime awareness. And ultimately, we will deliver an unmanned system that will seamlessly integrate into carrier operations.

These unmanned systems allow us to go beyond the limitations of human endurance, giving us a new level of persistent intelligence, surveillance and reconnaissance (ISR). Leveraging these capabilities greatly expands our battlespace awareness necessary to succeed in future maritime operations.

Secretary of the Navy Ray Mabus spoke to a crowd at the Navy League's Sea Air Space Symposium in April and said, "Unmanned systems, particularly autonomous ones, have to be the new normal in ever-increasing areas."

With a significant focus on developing and fielding UAS and integrating with other domain unmanned capability, the Program Executive Office for

Unmanned Aviation and Strike Weapons (PEO (U&W))'s contribution to the development of UAS is critical for continuing current and future maritime operations.

### New maritime strategy

Earlier this year, SECNAV released "A Cooperative Strategy for 21st Century Seapower." This updated strategy broadly describes changes in the world and specifically focuses on changes to maritime access that our forces must address. Unmanned systems will play an integral role in filling capability needs identified in this updated strategy.

We envision Navy UAS to be employed across a variety of scenarios:

- MQ-4C Triton providing broad area maritime surveillance around the globe
- Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) integrated into carrier air wings, providing direct support and maritime domain awareness for our carrier strike groups
- MQ-8 Fire Scout supporting anti-surface warfare, surface warfare or mine warfare from littoral combat ships
- RQ-21A Blackjack deploying from ships or land supporting maritime objectives

These systems will increase battlespace awareness by providing persistent surveillance of wide areas of ocean, the littorals and close-in coastal regions, the carrier battle group and Marine and Special Operations Forces personnel. Pushing into the future, we will integrate these aviation systems with unmanned systems operating on and below the world's oceans.

Battlespace awareness is one of the key elements of a new functional area



highlighted in our updated strategy—all domain access—or the ability to work across multiple domains.

"We must be able to achieve access in any domain," said Chief of Naval Operations Adm. Jonathan Greenert. "That means altering how we plan and coordinate actions in the air, sea, land, space and cyberspace domains, identifying and leveraging the right capability mix to assure access and freedom and action."

To meet these objectives, we need to work toward greater collaboration and cooperation between platforms, sensors, weapons and systems.

### Payloads over platforms

For years, we focused primarily on



Photo courtesy of Northrop Grumman

An X-47B unmanned aircraft flies past an MQ-4C Triton waiting on the taxiway April 15 at Naval Air Station Patuxent River, Md. Both aircraft are currently undergoing testing at Patuxent River.

platforms and modified the sensors to fit within the design space and weight available. This led to varying levels of compromise, often resulting in decreased capability of those sensors. While a platform is necessary to transport the payload to the desired location, the real value is in the product provided by the sensor or payload. With today's rapidly changing threat environment, we need to ensure that we focus more on the payload and the sensor capability. *(For more on sensors, see Triton Promises 'Persistent Picture' of Maritime Environment on page 24).*

The future force will operate

forward, rapidly responding to changing threats with modular, scalable, netted sensors and payloads on a range of sea/shore-based manned and unmanned systems.

### **It's all about knowledge for the warfighter**

Our guiding principles for information dominance stress that every platform is a sensor and every sensor is networked. Yet as these principles guide our development of unmanned systems, we must also focus on the need to provide actionable information to the warfighters, so the data must be meaningful and accessible.

One of my priorities as PEO (U&W) is to seamlessly integrate our sensors so that they have a breadth of spectrum, which also allows them to operate with the fidelity necessary to provide critical information. Ideally we will net these sensors together, but we must also generate resilient sensors that can operate autonomously in denied environments. We need ISR sensors that have the ability to adapt to changing operational needs and environments, while being able to integrate and fuse data to generate knowledge.

Whether it be electro-optic (EO), radio frequency (RF) receivers or radar

sensors, we need to develop a way to tie them together. Rather than trying to build single platforms for single mission sets, we're looking to optimize common modular systems across the force to better enable timely adaptation as the data requirements change.

We must also recognize that the operating environment in Iraq and Afghanistan is very different than in the open ocean or littoral regions. But regardless of the location, we must ensure our systems are optimized for all environments.

## Teaming up

By design, our UAS will complement the capabilities of our manned aircraft. Composite detachments will take advantage of an unmanned aircraft's long endurance, at the same time leveraging resources from manned squadrons to

increase the level of surveillance while reducing the footprint of deployed naval personnel.

We are already doing this today with the MQ-8B Fire Scout unmanned helicopter and the H-60 Seahawk. Helicopter Maritime Strike Squadron (HSM) 35 is the first detachment to operate both platforms. The Fire Scout complements the MH-60R by extending the range and endurance to enhance maritime domain awareness.

We will see this same manned-unmanned teaming concept with the Triton and P-8A Poseidon. Bringing the Triton into the Maritime Patrol Reconnaissance Force (MPRF) will provide a much

broader capability than either system could provide independently.

Our transition to the MPRF as a mix of manned and unmanned aircraft demonstrates the Navy's belief that unmanned systems enhance existing mission communities by extending their reach and persistence, while maintaining the flexibility and on-scene decision-making of manned aircraft.

## Future force

We are truly on the leading edge of expanding the potential of unmanned

**Rear Adm. Mark Darrah** received his commission through the Aviation Officer Candidate Program and was designated a naval flight officer in October 1983.

His operational fleet tours were with Electronic Attack Squadrons (VAQ) 137, 140, 136, Carrier Air Wing (CVW) 5 Strike Operations, and as the commanding officer of VAQ-142. Under his leadership, VAQ-142 completed successful combat deployments to Southwest Asia supporting Operations Northern and Southern Watch and were awarded the Chief of Naval Operations Annual Safety "S" for 2001. During these tours, he accumulated more than 3,200 flight hours and 603 carrier landings.

Ashore, he was assigned to VAQ-129 as an instructor; aide to the commander, Space and Naval Warfare Systems Command; Advanced Education Program at George Mason University; information operations planning officer/liaison to Joint Special Operations Command; Airborne Electronic Attack Systems and EA-6B Program Office (PMA-234) advanced systems integrated product team lead. After being designated as a member of the acquisition corps, he served as the first EA-18G deputy program manager when the office was established in January 2003.

During his tenure, the EA-18G program received the 2004 Association of Old Crow's Integrated Product Team Award and 2004 OSD(AT&L) Packard Award Certificate of Achievement. He was also recognized with the 2004 Admiral Perry Award



and 2004 Association of Old Crow's Metropolitan Chapter Lifetime Achievement Award.

He subsequently served as commanding officer, Pacific Missile Range Facility, Barking Sands, Kauai, Hawaii; and as the F/A-18 and EA-18G program manager from July 2007 to July 2011. After selection to flag, he served as the F-35 Joint Strike Fighter weapon systems program manager from July 2011 to October 2012.

In November 2012, he assumed the position as commander, Naval Air Warfare Center Aircraft Division and the assistant commander for Research and Engineering, Naval Air Systems Command. Darrah has been awarded the Legion of Merit (three), Defense Meritorious Service Medal, Meritorious Service Medal, Air Medal (four), Navy and Marine Corps Commendation Medal (four), Navy and Marine Corps Achievement Medal (three) and various other unit awards. 

# Unmanned Air Systems, Unparalleled Capabilities

**RQ-21A**  
**Blackjack**



**Planned Inventory**  
32 systems for Marines  
25 systems for Navy  
(each system is 5 air vehicles)

**Teaming with**  
Naval Special Warfare & Large Deck Amphibious ships

**Flight Endurance 16hrs**

**50**  
Nautical Mile Range

**MQ-8**  
**Fire Scout**



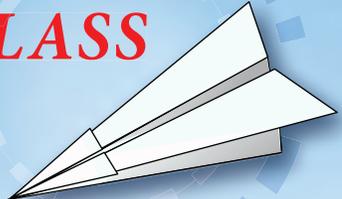
**Planned Inventory**  
30 MQ-8B  
40 MQ-8C

**Teaming with**  
MH-60 & Littoral Combat Ships (LCS)

**Flight Endurance 5.5hrs (B) 12hrs (C)**

**110** **150**  
Nautical Mile Range

**Unmanned Carrier-Launched Airborne Surveillance and Strike**  
**UCLASS**



**Planned Inventory**  
TBD

**Teaming with**  
Carrier Air Wing (CVW)

**Flight Endurance 14hrs**

**2,000**  
Nautical Mile Range

**MQ-4C**  
**Triton**



**Planned Inventory**  
68

**Teaming with**  
P-8A Poseidon

**Flight Endurance 30hrs**

**8,200**  
Nautical Mile Range

\* UCLASS information subject to change

Illustration by Melissa A. Johnson

systems. We recently demonstrated the capability to autonomously refuel an unmanned aircraft in-flight (see X-47B article on page 20). This was a significant step forward for the Navy. If we can transfer and receive fuel mid-air, we will have the ability to increase the range and flexibility of future unmanned aircraft platforms, ultimately extending carrier power projection.

These next few years are going to be critical for us as we begin to deliver increasing numbers of UAS to the fleet.

Netting unmanned systems together—complementing the current manned capability, and integrating across all domains with other unmanned systems operating on or below the waters we must dominate—will provide commanders with a greater

situational awareness of the battlespace than ever before.

Working together with our resource sponsors, the warfighter and the many agencies engaged in development and delivery of unmanned capability, we will ensure our naval forces are able to execute SECNAV's strategy built on the principles of being "forward, engaged and ready." 

# Grampaw Pettibone

Gramps from Yesteryear:  
May-June 2005

Illustration by

Ted Wilbur



## Viking Violence

As part of an S-3 Viking squadron Naval Air Training and Operating Procedures Standardization (NATOPS) unit evaluation, two weapons school instructors were scheduled for a flight with two squadron naval flight officers (NFO). The brief was thorough but didn't include any mention of the fact that, in addition to the standard post-stall gyration items, the weapons school pilot would be demonstrating cross-controlled inputs to show a more violent departure as part of the post-stall gyration portion of the hop. Once airborne, the pilot entered the first post-stall gyration at 21,500 feet by holding full aft, neutral lateral stick. He neutralized the controls and recovered by 14,000 feet. The pilot then entered a second post-stall gyration at 22,000 feet, utilizing unbriefed, cross-controlled inputs; booting full left rudder and holding the stick fully to the right. The Viking departed much more violently to the left, and then began to settle into a steady-state spin. The pilot held the prospin control inputs for at least three full revolutions. As the aircraft passed through 17,000 feet, he neutralized the controls and began scanning for indications of a recovery. The weapons instructor in the right seat, an NFO, began backing the pilot up with altitude calls. At 14,000 feet, the S-3 still hadn't recovered, and at that point one of the NFOs in the back also began calling out altitudes over the internal communication system.

The pilot continued to hold the controls neutral for a short time before shoving the stick full forward. At 10,000 feet—the hard altitude for ejection if the aircraft still isn't showing any indications of recovery—the angle of attack was pegged high, the turn needle was full left, and the airspeed was oscillating between zero and 70 knots. The S-3 NATOPS states that a constant airspeed is one of the indications of a spin, but the manual does not elaborate on what that airspeed actually is. The pilot reasoned that since the airspeed was oscillating, he wasn't in a spin, so he never put in antispin controls.

Passing 7,000 feet without any signs of imminent recovery, the pilot called for ejection. The instructor NFO in the right front seat initiated ejection, and as his seat fired clear of the aircraft, the rocket motors gave the pilot first- and second-degree burns on his face and neck. All four aviators were subsequently pulled out of the water by an air wing search-and-rescue helo.



**Grampaw  
Pettibone  
Says ...**

The only thing missing in this here escapade was the pilot saying, "Watch this," before he started his unbriefed departure. And "unbriefed" ain't never a good thing in my experience. Leave spontaneity to the horn blowers in them Beale Street jazz bands. Aviators need to brief the flight and then fly the brief. The lack of a clear definition in the Blue Pill regarding what constitutes a spin didn't help none, neither. Of course, at the cost of a sub-hunting tanker, the NATOPS reads a little more clearly now. All Gramps can say about that is it's a helluva way to run a railroad. ✈️

# Airscoop

Compiled by Jennifer Neal



U.S. Marine Corps photo by Staff Sgt. Jeffrey D. Anderson

Nepalese army soldiers unload aid and relief supplies, delivered by Joint Task Force 505, from a UH-1Y Venom in the Kavrepalanchowk District, Nepal, May 11, during Operation Sahayogi Haat. The U.S. government ordered JTF-505 to provide unique capabilities to assist Nepal.

## Relief efforts in Nepal

KATHMANDU, Nepal—Following a devastating earthquake that struck central Nepal April 25, joint U.S. forces came together to support multinational humanitarian assistance and disaster relief efforts.

U.S. Pacific Command, supported by U.S. Pacific Fleet; U.S. Marine Forces, Pacific; U.S. Pacific Air Forces; and U.S. Army Pacific, activated Joint Task Force 505 (JTF-505) on May 1 to limit further loss of life and human suffering.

During Operation Sahayogi Haat—”Helping Hand” in Nepali—the task force, working in coordination with the Nepalese government and the U.S. Agency for International Development, delivered about 120.2 tons of emergency relief supplies.

“We are grateful for the essential contributions of Operation Sahayogi Haat to the post-earthquake relief efforts,” said Peter Bodde, U.S. ambassador to Nepal. “The joint relief missions conducted by the U.S. and Nepalese militaries brought life-saving aid to those who needed it most and reinforced the United States’ close partnership with Nepal and its people.”

Three U.S. Marine Corps UH-1Y Huey helicopters and four Marine Corps MV-22B Osprey tiltrotor aircraft were used by the task force to deliver supplies, including plastic sheeting, shelter kits, blankets, water, medical supplies, and emergency and supplemental food. In addition to delivering aid, the task force transported 553 personnel and conducted 69 casualty evacuations.

Additionally, JTF-505 contributed four Air Force C-17 Globemaster IIIs, four Air Force C-130 Hercules and four Marine Corps KC-130J Hercules aircraft, as well as various ground and aviation command and control assets, to the effort.

Nepal transitioned from relief operations to the recovery phase of disaster response May 19, and the task force deactivated May 26.

The deadly magnitude-7.8 earthquake April 25 and subsequent magnitude-7.3 earthquake aftershock May 12 claimed more than 8,600 lives and injured approximately 16,800 people according to the latest official numbers. 🐦

## In Memoriam

We remember the six U.S. Marines who lost their lives along with two Nepalese soldiers when their UH-1Y Huey helicopter crashed May 12 eight miles north of Charikot, Nepal. The team was supporting casualty evacuations following a second earthquake of magnitude-7.3 that same day.

*The fallen Marines are:*

- **Capt. Dustin R. Lukasiewicz**, 29, a UH-1Y pilot with Marine Light Attack Helicopter Squadron (HMLA) 469, Marine Aircraft Group 39, 3rd Marine Aircraft Wing, Camp Pendleton, California, and a native of Harlan, Nebraska;
- **Capt. Christopher L. Norgren**, 31, a UH-1Y pilot with HMLA-469, Marine Aircraft Group 39, 3rd Marine Aircraft Wing, Camp Pendleton, California, and a native of Sedgwick, Kansas;
- **Sgt. Ward M. Johnson, IV**, 29, a UH-1Y helicopter crew chief with HMLA-469, Marine Aircraft Group 39, 3rd Marine Aircraft Wing, Camp Pendleton, California, and a native of Seminole, Florida;
- **Sgt. Eric M. Seaman**, 30, a UH-1Y helicopter crew chief with HMLA-469, Marine Aircraft Group 39, 3rd Marine Aircraft Wing, Camp Pendleton, California, and a native of Riverside, California;
- **Cpl. Sara A. Medina**, 23, a combat photographer with Marine Corps Installations Pacific, Okinawa, Japan, and a native of Kane, Illinois; and
- **Lance Cpl. Jacob A. Hug**, 22, a combat videographer with Marine Corps Installations Pacific, Okinawa, Japan, and a native of Maricopa, Arizona.

## 'Grumpy' Happy to Join 1,000-Trap Club

ATLANTIC OCEAN—Carrier Strike Group (CSG) 8 Chief of Staff Capt. Keith “Grumpy” Kimberly entered the record books June 29 after completing his 1,000th arrested landing on the flight deck of aircraft carrier USS Harry S. Truman (CVN 75).

Flying an F/A-18F Super Hornet, Kimberly became the 371st aviator to join the exclusive 1,000-trap club, which dates back to 1911.

“The significance of a 1,000th trap achievement is that it’s indicative of a lifetime commitment to naval aviation,” said Rear Adm. Brett “Pops” Batchelder, CSG 8 commander. “To get to that number, an aviator has probably done around seven deployments—at a minimum six. That’s many years’ worth of commitment and I would tell you that to stick around that long and achieve that milestone shows a real aptitude for the profession.”

Batchelder explained that less than two-tenths of a percent of all naval aviators make it to 1,000 arrested landings, and that it is Kimberly’s dedication to the job that has helped him into this prestigious group. A total of 174,848 pilots have flown in the fixed-wing community since what is rec-



U.S. Navy photo by MC3 E. T. Miller

*Sailors congratulate Capt. Keith “Grumpy” Kimberly, Carrier Strike Group (CSG) 8 chief of staff, after landing an F/A-18F Super Hornet on the flight deck of aircraft carrier USS Harry S. Truman (CVN 75). The event marks Kimberly’s 1,000th arrested carrier landing.*

ognized historically as the first trap aboard USS Pennsylvania (BB 38) in 1911.

“I didn’t meet Capt. Kimberly until 2008,” said Batchelder. “Thanks to his reputation, I knew of him long before we met. He is a dedicated professional. He is the glue that keeps things together out here in the strike group. He is my link to the warfare commanders, an incredibly talented team builder and has very high professional standards. In addition to all of those things, he still finds time to fly day and night—in F/A-18s off an aircraft carrier. That is no small feat.”

Kimberly’s 1,000th trap marks a mile-

stone in an already impressive career, one in which he has been awarded the Legion of Merit, Distinguished Flying Cross and Meritorious Service Medal in his 24 years as a naval aviator—and he plans to keep flying.

“Hitting your 1,000th trap is an unbelievable milestone that is impossible without all the men and women in the Navy,” said Kimberly. “It’s the kind of thing you don’t ever think is going to come about, but once in a while, if you stick in there long enough, it’s a fantastic opportunity. I’m just very thankful to have the chance.” 🦅

## Team Carl Vinson Reaches 10,000th Launch, Recovery Milestone



MC2 John Philip Wagner, Jr.

*An E-2C Hawkeye assigned to VAW-116 makes the 10,000th launch of the deployment on the flight deck of USS Carl Vinson (CVN 70) May 4 in the Indian Ocean.*

USS CARL VINSON, At Sea—Aircraft carrier USS Carl Vinson (CVN 70) and embarked Carrier Air Wing (CVW) 17 launched and recovered the 10,000th aircraft of their current deployment in May.

An Airborne Early Warning Squadron (VAW) 116 “Sun Kings” E-2C Hawkeye completed the 10,000th launch, while a Strike Fighter Squadron (VFA) 81 “Sun Liners” F/A-18F completed the 10,000th arrested landing.

“Ten thousand launches and arrested recoveries is a significant milestone for this crew,” said Capt. Karl Thomas, Carl Vinson’s Commanding Officer. “What is truly amazing is the full availability of four catapults and four arresting wires every day for the duration of an extended deployment.”

Thomas also expressed his gratitude to the pilots and Sailors assigned to CVW 17.

Carl Vinson is operating in the U.S. 7th Fleet area of operations supporting maritime security operations and theater security cooperation efforts in the Indo-Asia-Pacific region. 🦅

## F-35C Conducts First Detachment Visit at NAS Lemoore

SAN DIEGO, Calif.—Two F-35C Lightning II aircraft from the “Grim Reapers” of Strike Fighter Squadron (VFA) 101, based at Eglin Air Force Base, Florida, paid their first visit to future basing site Naval Air Station Lemoore, California, in April.

The six-day visit gave aviators, maintainers, installation personnel and members of the community an opportunity to learn more about the aircraft and watch it in action. The F-35C is scheduled to arrive in 2017.

“It was great to see so many Sailors and community members interested in the F-35C,” said Cmdr. Frederick Crecelius, VFA-101 Commanding Officer. “Lemoore will be the new home of the F-35C in the future, and I think there was a lot of interest to see what it looks like up close and get a preview of it sitting beside the Super Hornets that it will be operating with in the air wing of the future.”

The F-35C will enhance the flexibility, power projection and strike capabilities of carrier air wings and joint task forces and will complement the capabilities of the F/A-18E/F Super Hornet, which currently serves as the Navy’s premier strike fighter.

By 2025, the Navy’s carrier-based air wings will consist of a mix of F-35C, F/A-



U.S. Navy photo by Lt. Cmdr. Darin Russell

18E/F, EA-18G Growlers electronic attack aircraft, E-2D Advanced Hawkeye battle management and control aircraft, MH-60R Seahawk helicopters and Carrier Onboard Delivery logistics aircraft.

Ten F-35C carrier variant aircraft will be assigned to a strike fighter squadron based at NAS Lemoore in early 2017. ✈

*Two F-35C Lightning II aircraft fly in formation over the Sierra Nevada mountain range with two F/A-18E/F Super Hornets from Naval Air Station Lemoore, Calif. The flight is part of a six-day visit by Strike Fighter Squadron (VFA) 101, the “Grim Reapers,” based at Eglin Air Force Base, Fla., to NAS Lemoore, the future basing site for the F-35C.*



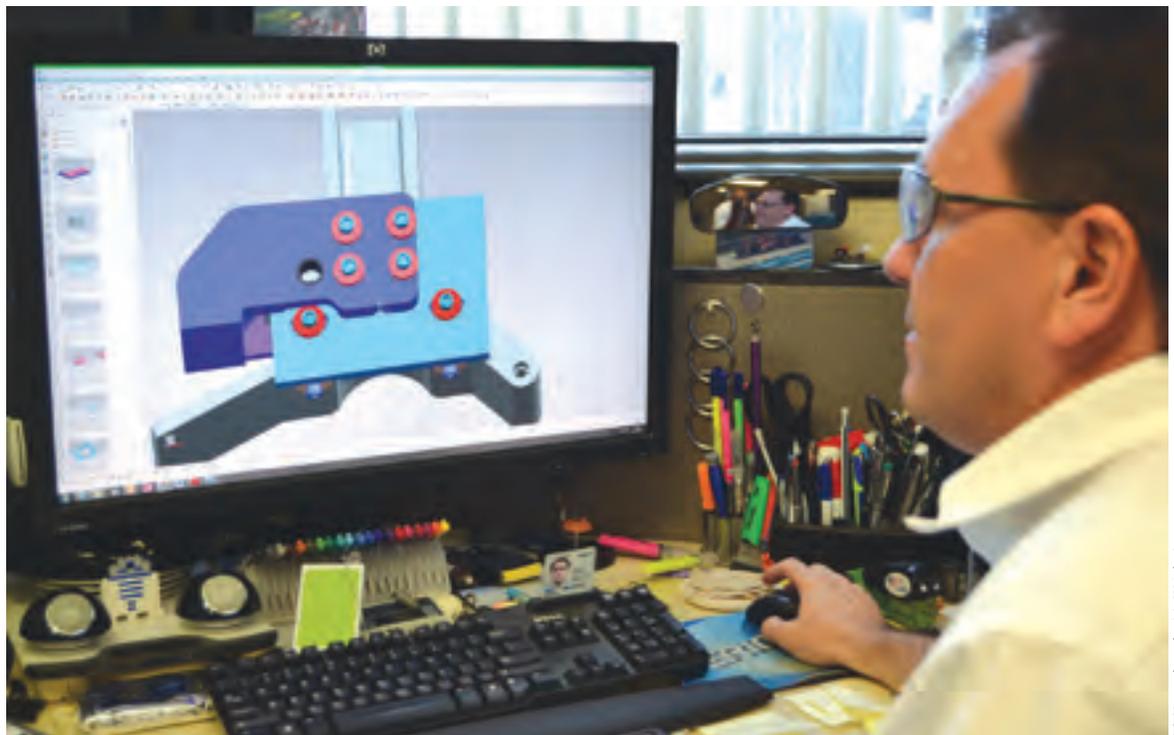
U.S. Navy photo by Lt. Cmdr. Darin Russell

*Two F-35C Lightning II aircraft before a break maneuver with an F/A-18E Super Hornet from Naval Air Station Lemoore, Calif.*



*Fleet Readiness Center Southeast artisans test the functionality of a P-3 Orion's landing gear at Hangar 1000 May 15. A team of tool designers, artisans and engineers from FRCSE used additive manufacturing to repair the Orion's wheel-well truss. The aircraft has been in repair since October 2014.*

*Randall Meeker, a mechanical engineering technician, uses a 3-D computer software program to analyze a tooling design at FRCSE May 12. Meeker and his colleagues used additive manufacturing to print a 3-D prototype of a repair fitting to fix a P-3 Orion.*



### **3-D Printing Gets Orion Back in Air**

JACKSONVILLE, Fla.—A team of tool designers, artisans and engineers from Fleet Readiness Center Southeast (FRCSE) used what’s known as Lego plastic—material acrylonitrile butadiene styrene—to repair a P-3 Orion for the fleet.

The aircraft, which sustained rare damage to a wheel-well truss, arrived at Naval Air Station Jacksonville, Florida, for repair last October. This particular truss supported the nose landing gear of a 100,000-pound airplane.

“Not only was this a unique and complex repair, we were under a time constraint with the runway scheduled to close this summer,” said Randall Meeker, mechanical engineering technician and tool designer.

Meeker and his colleagues began working with Lockheed Martin to find a solution. After several months, Lockheed Martin engineers developed a repair fitting to fix the issue.

“They sent us the design of the repair fitting so we could develop tooling to install it,” said Santiago Alvarez, mechanical engineering technician and tool designer. “We used additive manufacturing capabilities to print a 3-D prototype of the fitting. When we tested it, we noticed some flaws in the design.”

The repair fitting design required additional modifications before it was suitable for installation, Meeker said. "It would have taken at least a month and a half for Lockheed Martin to manufacture that fitting before they could ship it to us," he added. "If we had received the part as originally designed, we would've missed our deadline."

While Lockheed Martin corrected the design, military depot personnel began creating the tooling, FRCSE aerospace engineer Rosa Cafasso said.

"This is the first time in history we

## P-8A Team Saves Billions

PATUXENT RIVER, Md.—The Maritime Patrol and Reconnaissance Aircraft program office (PMA-290) saved \$5.2 billion in 2014 by integrating "should-cost" objectives across all phases of acquisition for the P-8A Poseidon, earning a DoD acquisition excellence award May 21.

Secretary of Defense Ash Carter and Frank Kendall, undersecretary of defense for acquisition, technology and logistics, presented the 2014 David Packard Excellence in Acquisition and Should-Cost and Innovation Award to PMA-290 at a ceremony held in Washington, D.C.

"This is one of the many cutting-edge platforms that are deploying to the Asia-Pacific region," Kendall said, "and our personnel in the field are already calling it a 'game-changer.' The aircraft's superior performance makes this team's savings even more impressive."

"Should cost" is a Better Buying Power initiative to increase productivity and reduce cost. It challenges DoD leadership to reevaluate a program's cost estimate to represent efficient economics within the constraints of a declining budget.

"Our team continually challenges the norm, asking 'can we do better?'" said Capt. Scott Dillon, PMA-290 program manager. "From production efficiency to full life-cycle management, we have been thinking outside of the box to deliver warfighting capability to the fleet in a timely and cost-effective manner."

P-8A is the first Navy aircraft to be built from the start on a commercial production line, which allows the program to significantly reduce time and overall cost. Boeing Commercial

have had to make this repair on a P-3," she said. "We worked on this project for months and it was very tedious. Thanks to everyone's effort and our 3-D printing capability, we were able to come up with the proper fitting to repair it."

Approximately \$300 worth of 'Lego plastic' was used to print the original prototype, but the time saved in getting this plane back to the fleet makes the capability invaluable, Meeker said. 🚀



Members of the Maritime Patrol and Reconnaissance Aircraft program office (PMA-290) receive the 2014 David Packard Excellence in Acquisition and Should Cost and Innovation Award from Secretary of Defense Ash Carter (third from left) May 21 at a ceremony in Washington, D.C. PMA-290's efforts led to \$5.2 billion in savings across the full-scope of P-8A Poseidon development, production and sustainment phases.

Airplanes integrates P-8-unique systems—such as hydraulics, wiring and aircraft structures—early in the production process, which eliminates the need for costly rework during final mission systems installation by Boeing Defense Systems.

"We worked with our resource sponsor and industry counterparts to develop practices that show we have a long-term view in mind," Dillon said. "We maintain productivity and efficiency while constantly evaluating how to best function in this environment of budget uncertainty."

Since the first operational deployment in 2013, the P-8A has flown nearly 34,000 hours in more than 6,000 sorties. The should-cost effort has saved the program billions of dollars and will continue to do so for years to come, Dillon added. 🚀



A sled moves along the flight deck of Gerald R. Ford (CVN 78) during a test of EMALS.

Ship's sponsor Susan Ford Bales, daughter of former President Gerald R. Ford, autographs a test sled.



Sailors from Gerald R. Ford (CVN 78) prepare to launch a "dead-load" from the ship's Electromagnetic Aircraft Launch System (EMALS).



Susan Ford Bales (far right) gives the signal to launch a test sled.

By Victor Chen

## New Aircraft Launch System Tested on Future Carrier

With a heavy rumble and a loud splash, the Navy successfully tested its new Electromagnetic Aircraft Launch System (EMALS) when it sent a four-ton sled aptly named "Ledder Rip" careening off Gerald R. Ford (CVN 78) and plummeting into the James River, Virginia, June 16.

Hurling these dead-loads—wheeled sleds representing different aircraft weights—marks a significant testing milestone for the first new aircraft launch technology employed by the Navy in more than 60 years.

In a ceremonial gesture, Susan Ford Bales, the ship's sponsor and daughter of the late President Ford for whom the ship is named, gave the launch signal by extending her left arm while on one knee.

"The adrenaline of seeing the speed of the launch was amazing," Bales said.

Dead-load testing is a joint effort among Naval Air Systems Command, Naval Sea Systems Command, the crew of CVN 78, EMALS prime contractor General Atomics, and Huntington Ingalls Industries Newport News Shipbuilding. The ship's test data will be compared to land-based test data, and after adjustments, will become the basis for test launching the first manned aircraft off the ship in 2016.

Before the launch, Bales and other dignitaries signed the dead-load, which was first used June 5, and nicknamed after John D. Ledder, the Newport News lead for NAVAIR's Carrier and Field Service Unit (CAFSU). Ledder had a significant role

in supporting the EMALS installation on CVN 78. He died in 2012.

"It is truly fitting we recognized John today," said Capt. Douglas Belvin, deputy program manager for future systems in the Aircraft Launch and Recovery Equipment Program Office (PMA-251). "Behind this event are thousands of talented civilian engineers and technicians who dedicate their life's work to delivering new technologies to the fleet."

An example of NAVAIR's civilian talent, CAFSU is the link between the aviation program offices and the hands-on work of building, maintaining and overhauling the Navy's aviation-capable ships.

"CAFSU plays a very important role for NAVAIR," said Robert Puakea, the current CAFSU lead at the Supervisor of Shipbuilding Newport News office. "Not only do we ensure NAVAIR's equipment gets installed and tested correctly, we interface daily with the shipbuilder to make real-time decisions as needed and reach back to the teams at Lakehurst [and Patuxent River], so they know how to adjust designs or procedures to make future aircraft launch and recovery equipment systems work better."



A 16,000-pound sled lands in the James River, following a successful launch in Newport News, Va.

U.S. Navy photo by MC1 Joshua J. Wahl

U.S. Navy photo by MC2 Cory Rose



A tugboat retrieves a launched sled from the James River.

Puakea said EMALS testing is still maturing.

“We are very early in collecting the test data,” Puakea said. “We have to remember that in terms of EMALS, everything we are doing is brand new. This is the only place on the planet where electromagnetics are going to launch tactical aircraft off a carrier.”

Electromagnetics offer several advantages over steam-powered catapults.

The newer system has a wider energy range over the current steam-powered catapults. A wider energy range expands the Navy’s future aircraft carrier operational capabilities, supporting the launch of the current and planned air wing composition—from lightweight unmanned aerial systems to heavy strike fighters.

EMALS also provides increased sortie rates, more accurate end speed control and smoother acceleration, which reduces stresses on aircraft during launch.

The system automates much of the maintenance and troubleshooting procedures and employs a modular architecture, allowing for easier repairs or component replacements. This then permits a reduction in the human workload required to operate and maintain the system, and a subsequent cost reduction over time.

Removal of a significant amount of steam, hydraulic and air piping also means Sailors will enjoy cooler and quieter working and living spaces.

Victor Chen is director of Corporate Communication, Naval Air Warfare Center Aircraft Division at Patuxent River Naval Air Station, Md. 🇺🇸

## How Sailors Prepared for the Test Launch

By Carrie Griffin Munn

A few dozen Sailors from Gerald R. Ford’s Pre-Commissioning Unit completed specialized training to operate and maintain the Navy’s newest aircraft launch system to prepare for shipboard testing.

Industry partner General Atomics in Rancho Bernardo, California, trained the first crew, and two more groups completed training sessions at the full-scale EMALS System Functional Demonstration site at Joint Base McGuire-Dix-Lakehurst, New Jersey, earlier this year. In the future, the low- and high-voltage safety training curriculum will be part of the formal EMALS course at Navy schoolhouses.

“This is the ultimate to me . . . I never dreamt I’d be working on something like this,” said Aviation Boatswain’s Mate (Equipment) (ABE) 1st Class Earl Fowlkes.

“EMALS is such a leap in technology, using high voltage electromagnetic power rather than the steam that powers the legacy catapults, and extra caution and respect must be exercised during maintenance operations to ensure the safety of personnel,” said Terry Hotz, EMALS training manager.

EMALS features modular components, which makes removal and replacement of faulty parts a straightforward task, and the technology boasts a high degree of computer control, monitoring and automation displayed to Sailors at the Maintenance Work Station (MWS) and Launch Control Monitor Station.

“I really like the MWS aspect of the new system,” said Ford division officer Lt. Jared McCaleb. “You quickly know where the issue is and are able to get right down to fixing it. With the legacy system, there was a lot more troubleshooting to determine where the issue lies.”

The Navy plans to field an Interactive Electronic Technical Manual with the new system, leveraging engineering models to create a three-dimensional view of components that Sailors will be able to highlight, zoom, rotate and bookmark during maintenance procedures. The interactive manual also boasts a search function, allowing for quick and efficient access to detailed information such as illustrated parts breakdowns and wiring diagrams.

Carrie Griffin Munn is a communications specialist supporting the Aircraft Launch and Recovery Equipment Program Office (PMA-251). 🇺🇸



Photo courtesy of General Atomics

Sailors from Gerald R. Ford’s (CVN 78) V-2 Division, from left, Aviation Boatswain’s Mate (Equipment) Senior Chief Thomas Creaturo, Aviation Boatswain’s Mate (Equipment) 1st Class Earl Fowlkes and Aviation Boatswain’s Mate (Equipment) 2nd Class Dennis Paglingayan test out the EMALS maintenance workstation during an intensive training event.

# DEPARTMENT OF THE NAVY INNOVATION VISION

*Excerpts from Secretary of the Navy Ray Mabus*

*DoN Innovation Vision released April 2015*

**“It is clear that innovation is not just about buying a new platform or weapon system; rather it is about changing the way we think, challenging outdated assumptions, and removing bureaucratic processes that prevent great ideas from becoming reality.**

**“Innovation, and ultimately the success of our naval mission, is based on three fundamental things: people, information and ideas.**

**“I want the entire workforce, from the most senior admirals, generals and civilian executives to recruits and officer candidates, to look for ways to improve their organizations and accomplish their missions today ... Leaders across the department must be open to new ideas and unafraid if they all do not succeed.”**

## **Why Now?**

A dynamic security environment and tightening fiscal constraints demand that DoN change to shape its future. Failing to do so now adds unnecessary risk to our operating forces and ultimately the nation.

## **The Innovation Vision Identifies Five Essential Elements:**

### **1 Build the Naval Innovation Network**

DoN has a multitude of virtual and physical resources to support innovators. The Naval Innovation Network will serve as the backbone to create a virtual environment to connect innovators from across the DoN enterprise. It will provide a forum to connect and exchange best practices, share information, develop ideas through an ideation platform, and scale successful local programs.

The goal is to challenge the workforce and empower it to strengthen the naval services by sharing ideas and insights, and creating an environment that accepts and rewards prudent risk.

DoN will develop new incentives to reward innovators and their leaders across the department, and provide greater access to tools, training and technology. This includes boosting workforce interaction with emerging technologies, such as 3-D printers and software development and engaging other innovators.



U.S. Navy photo

*“Right now, there are examples of innovation occurring in pockets all over the fleet. We owe all our Sailors, Marines and civilians a platform by which their ideas can reach the decision makers.”*

## 2 Manage the Talent of the DoN Workforce

We must create an environment that seeks out, appreciates and supports the creativity, expertise and insights of our Sailors, Marines and civilians to solve the difficult challenges that lie ahead of us.

The civilian and military personnel systems must leverage data analytics to inform career paths, offer transparent career options and provide the workforce with greater flexibility. Crucial changes to DoN workforce practices include knowing what skills and training our people possess. With that information, we can take good ideas for solving problems and match creative people to solve them.

## 3 Transform How DoN Uses Information

DoN collects more data each day than the total amount stored in the Library of Congress. Yet, DoN is organized and funded around systems and hardware and lacks the tools to ensure the information is used to its full potential.

Sharing information across organizational boundaries enables innovation to thrive. DoN will integrate technology and adopt best practices to become a learning organization by mastering the information cycle.

## 4 Accelerate New Capabilities to the Fleet

The development of new technology or repurposing existing resources gives rise to innovative operational capabilities for the fleet. By their nature, many new capabilities challenge bureaucratic processes developed for a different era. Cyber/information technology, unmanned systems and advanced manufacturing must not be placed in the same developmental process as used to buy ships or aircraft.

Advanced manufacturing, for example, has the potential to revolutionize our logistics, supply-chain and acquisition systems. For DoN to realize advanced manufacturing’s full potential, we must aggressively test and evaluate new capabilities in an operational environment and reform processes that are designed for legacy systems.

Promoting a culture that tolerates and recognizes the value of risk includes a more robust experimentation process where risk can be better understood and mitigated.

## 5 Develop Game-Changing Warfighting Concepts

It is critical that we develop a variety of concepts to give joint force commanders and national policy makers effective options to consider during all phases of military operations and to continually challenge our adversaries’ assumptions. 

# X-47B PASSES UNMANNED

The U.S. Navy's X-47B is the first unmanned aircraft to successfully refuel midflight—a feat test pilots found more challenging than landing it on an aircraft carrier.

*By Jeff Newman*



**T**HE AIRCRAFT ONLY HAD A MATTER OF INCHES IN WHICH feet on the aircraft carrier,” said Lt. Cmdr. Jeff McLean, Air project officer for the X-47B, the Navy’s demonstrator aircraft carrier can move with the ocean, but it’s move so wildly and unpredictably in

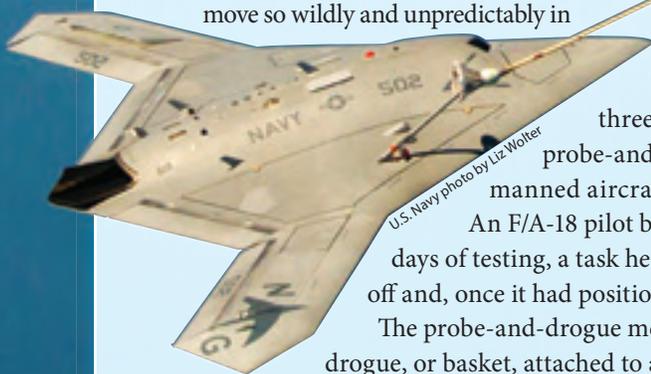
IT COULD MOVE versus a number of Test and Evaluation Squadron (VX) 23 project for a future carrier-based unmanned aircraft. “The still relatively stable, whereas the [drogue] basket can just space that it’s the real challenge.”

Despite the challenges, the X-47B linked with an Omega KC-707 tanker and received more than 4,000 pounds of fuel during three days of testing in April over the Chesapeake Bay using the Navy’s probe-and-drogue method—the same one used by Navy pilots when refueling manned aircraft.

An F/A-18 pilot by training, McLean was one of two operators during the first two days of testing, a task he said amounted to pushing buttons that initiated the aircraft’s take-off and, once it had positioned itself behind the tanker, prompted the refueling process.

The probe-and-drogue method requires the refueling aircraft to insert a fixed probe into a drogue, or basket, attached to a tanker’s fuel hose.

The chief difference between a manned and unmanned refueling, McLean said, comes in accounting for the constant bobbing motion of the drogue—which resembles a badminton shuttlecock—as it trails behind the tanker.



# REFUELING TEST



Whereas human pilots can instinctively anticipate the drogue's movement, the X-47B has cameras that track the basket and perform calculations to predict where it will be at the moment of connection.

"The drogue bounces around in space, so a pilot can make tiny little corrections in real time, whereas the X-47B is doing a whole bunch of computations and essentially sets up a time and space where it thinks the basket is going, and if the basket is bouncing up and down, that can be difficult," McLean said.

The plane uses GPS to approach the tanker until it is about 20 feet from the drogue, at which point the optical system takes over, McLean said.

Like any aircraft, the X-47B also produces a thin, forward pulse of air known as a "bow wave," which can move the basket just as the probe is approaching, similar to a speeding car pushing falling snowflakes over its hood.

"That's why it's such a huge achievement, because of all those unknowns, and when you're talking about inches of precision required, any bump the tanker hits only magnifies movement for the basket, like the whip of a tail," McLean said.

*The Navy's X-47B trails behind an Omega KC-707 tanker April 11 over the Chesapeake Bay in preparation for aerial refueling testing that will begin four days later. The testing successfully concluded April 22, marking the first time that an unmanned aircraft refueled midflight.*



U.S. Navy photo by Liz Wolter



“Before the optical system takes over for the fine movements of the basket, the plane is flying by GPS at a relative position to the tanker, so we had to figure out how high up and down the plane should start that approach to reduce the bow wave’s effect.”



U.S. Navy photo by Liz Wolter

*The Navy's X-47B receives fuel from an Omega KC-707 tanker via the probe-and-drogue method April 22 over the Chesapeake Bay. The test team, based out of Patuxent River, Md., achieved all three of its test objectives, including staying connected for five minutes.*

Another challenge is that, with its probe out on the right wing, the X-47B has to fly with a focus on keeping that part of the plane stable while refueling. While landing on a carrier, the X-47B can keep its center mass steady as in normal flight.

The first day of testing was spent calibrating how the drogue would react to the X-47B's bow wave. The team programmed the aircraft to approach the basket from a certain position, but found that the bow wave moved the basket up and to the right far enough that the X-47B could not chase it. So they offset the approach up and to the right by one foot, and achieved a successful plug on their last attempt of day one.

“The next day we went back and we nailed it because we’d figured out where the plane should be positioned to make the basket predictable and it was pretty much automatic,” McLean said. “Before the optical system takes over for the fine movements of the basket, the plane is flying by GPS at a relative



*With its fuel probe extended over the right wing, the Navy's X-47B approaches the fuel line of an Omega KC-707 tanker April 22 while flying over the Chesapeake Bay en route to becoming the first unmanned aircraft to aerially refuel. The test team had to augment the X-47B's approach to account for the aircraft's bow wave, which initially pushed the hose out of the probe's reach.*

U.S. Navy photo by Liz Wolter

position to the tanker, so we had to figure out how high up and down the plane should start that approach to reduce the bow wave's effect."

McLean contrasted the refueling of an X-47B with that of an F/A-18, which has its probe far back enough on the nose that pilots are able to easily anticipate the plane pushing the basket up. "It's a very predictable movement. We basically know where the basket is going to move," he added.

### **Turbulence remains mid-air refueling challenge**

McLean said the team had three objectives during testing: three successful plugs, to stay connected for five minutes, and ultimately transfer 3,000 pounds of fuel. It accomplished the first two goals during the second day, and wrapped up the third in short order on day three.

"It didn't last very long," McLean said of the third day of testing. "Pretty straightforward. It was quick because it was successful right away."

"Pretty straightforward" only applies when the refueling is conducted amid clear skies and the basket is affected by minimal turbulence.

"It is predictable, but the challenging variable is turbulence," McLean said. "If there's turbulence, then the unmanned refueling becomes much, much harder. I think that is something that with more testing they could improve the system, but I think it's always going to be a challenge. That's the challenge for manned refueling too, is the motion of the basket."

The Navy is examining a range of potential follow-on activities involving the X-47B air vehicles, which remain in flyable stand-by status at Patuxent River, Maryland.

*Jeff Newman is a staff writer and contributing editor to the Naval Aviation News magazine. ✈*

A decade ago, the U.S. Navy purchased two first-generation RQ-4 Global Hawks to see if it could adapt the U.S. Air Force's unmanned high-altitude surveillance aircraft to keep watch over the seas.

In 2008, the Navy deployed the aircraft, renamed the Broad Area Maritime Surveillance-Demonstrator (BAMS-D), to conduct real-world operations in what was initially intended as a six-month test deployment.

“So they tried it out, and seven years later they’re still flying it in theater, and the combatant commanders don’t want to let it go, and that’s why we’re building Triton,” said Lt. Cmdr. Glenn “Neo” Rioux, government flight test director for the MQ-4C Triton, the Navy’s successor to BAMS-D.

Similar in appearance to Global Hawk, Triton, which began flight testing at Patuxent River Naval Air Station, Maryland, in April, boasts a 131-foot wingspan—similar to that of a Boeing 757 airliner—and is designed to fly up to 30 hours continuously without refueling at altitudes reaching 60,000 feet.

Triton features a suite of four sensors—maritime radar, which provides 360-degree surveillance; an automatic identification system (AIS) receiver; electronic support measures (ESM) that detect radar signals from seafaring vessels; and an electro-optical/infrared (EO/IR) camera, which can take high-resolution pictures and video of suspicious targets. However, the real show-stopper is the airframe, and its ability to provide “persistent” coverage over a wide swath of ocean, Rioux said.

“The difference is that it’s on this airframe that’s flying at a very high altitude and is, you’ll hear this word again, persistent,” he said. “Because of how efficient this airplane is at altitude, it has a very long time that it can fly, and when you pair that up with multiple airplanes and multiple crews at the ground control stations, you can rotate airplanes through to provide continuous coverage of an area, and that’s the persistent piece.”

In addition to being able to fly far longer on a tank of gas than current Navy aircraft, the unmanned Triton also does not have the limitations that come with having human beings onboard.

Once in the air, Triton can use its radar, officially known as

# Triton Promises 'PERSISTENT of Ma

*By Jeff Newma*



## MQ-4C Triton: Suite

**Electro-Optical  
Infrared  
Sensor**

Capturing Still Imagery  
and Full-Motion Video

**Electronic  
Support  
Measures**

Identifying  
Threat Signals

# IT PICTURE' ritime Environment

n



U.S. Navy photo by Erik Hildebrandt

## te of Four Sensors

### Multi-Function Active Sensor

Conducting 360°  
Surveillance

### Automatic Identification System

Tracking Suspicious  
Vessels

its Multi-Function Active Sensor (MFAS), to sweep the sea for targets. It will scan the same area multiple times and only alert the ground crew to objects it detects consistently, Rioux said.

“We don’t really see any visual radar returns. We see processed information where the plane says, ‘Hey, there’s a ship here,’” he said. “There are times where radar energy bounces off waves, so the higher the sea state is, the more returns the radar is receiving, but that is just radar noise. The hardware and the software are supposed to filter out those spurious returns and figure out, ‘Hey, I’m getting a strong return consistently here, there’s some object there that this energy is bouncing off of.”

Once the radar has picked up an object of interest “that we want to get a closer look at,” it can switch to another mode that produces a “silhouette-type” image, Rioux said.

The radar also works alongside Triton’s AIS receiver and ESM sensor to identify ships.

Similarly, Triton’s ESM sensor is designed to not only detect radar signals but recognize what type of ship is transmitting them.

“So if the ESM system picks up an emission and it’s the same or similar to the characteristics of a radar system that they normally have on ships, if you have a dot from the radar and a line from the ESM, well now I can say that there’s something there and it’s radiating this system, or something like it.

It’s another piece of the puzzle,” Rioux said.

For an even closer look, Triton is able to descend thanks to wings that are resistant to ice and tough enough to endure strikes from hail, lightning and even birds. From below the clouds, the plane’s EO/IR camera can take pictures or provide continuous video surveillance of a suspect ship.

“The EO/IR, especially at the altitudes that we fly at, is like looking through a soda straw, so in order to find someone on the water, you need to know where they are to be able to point the camera at it,” Rioux said.

The Navy plans to order a total of 68 Tritons from manufacturer Northrop Grumman, with the goal of having the first aircraft operational by 2017 and working in tandem with the manned P-8 Poseidon. Together, both platforms are intended to replace the P-3C Orion and EP-3E Aries II surveillance aircraft. While the Triton’s aerial endurance will allow it to keep constant watch over the ocean surface, the P-8 is able to detect both surface ships and submarines.

*Jeff Newman is a staff writer and contributing editor to the Naval Aviation News magazine.* ✈



*By Maj. Paul Greenberg*

As amphibious assault ship USS Wasp (LHD 1) cut an arc between 50 and 100 miles off the East Coast on May 18, it became the base for the first F-35B Lightning II operational tests (OT-1) at sea.

# MARINE CORPS PROVES F-35B'S CAPABILITY AT SEA

Two weeks of testing assessed the aircraft's integration with the ship while operating a wide array of flight and deck operations.

While aboard Wasp, 10 U.S. Marine Corps pilots received F-35B carrier qualifications and flew 11 night missions in addition to flying more than 76 hours while executing 106 sorties using six F-35B Lightning II aircraft. The sorties included 100 short takeoffs and vertical landings, and a fly-off from the ship when testing ended May 29.

About 120 Marines from the following squadrons worked together with Navy personnel, civilian contractors and industry partners: Marine Operational Test and Evaluation Squadron (VMX) 22, based in New River, North Carolina; Marine Fighter Attack Squadron (VMFA) 121, based in Yuma, Arizona; Marine Fighter Attack Training Squadron (VMFAT) 501, based in Beaufort, South Carolina; and Marine Aviation Logistics Squadrons (MALS) 13 and 31 based in Yuma, Arizona, and Beaufort, South Carolina, respectively.

"Throughout my career, I've seen Marines accomplish objectives that would be

*A sailor aboard the USS Wasp (LHD 1) signals to the pilot of an F-35B Lightning II to land as it arrives for the first phase of operational testing.*

U.S. Marine Corps photo by Lance Cpl. Remington Hall

impossible for others. It was an incredible experience, and a historic landmark for the Marine Corps,” said Col. Robert Rauenhorst, Commanding Officer of VMX-22, who served as the senior Marine on deck throughout the exercise.

“Marines transitioning to the F-35B from their AV-8B and F/A-18 legacy platforms demonstrated amazing feats of work: flying, maintaining and logistically supporting operations at sea,” Rauenhorst said. “They knocked this one out of the park, successfully ac-

- Confirmed aircraft-to-ship network communications interoperability
- Trained and certified a new F-35B landing signals officer
- Proved the effectiveness of the F-35B landing signals officer’s launch and recovery software
- Documented the maintenance crew’s ability to conduct scheduled and unscheduled day and night maintenance activities
- Performed engine lift fan removal and installation at sea

in key areas of the ship and applying Thermion, a temperature-resistant deck treatment, to two areas in the aft part of the flight deck to withstand the high thermal output of the F-35B as it lands.

The tests also featured carrier-launched simulated dogfights, consisting of two F-35Bs flying defensive counter-air missions in support of Wasp, while two others performed simulated adversary strike missions against the ship.

OT-1 achieved an additional mile-

*“Marines transitioning to the F-35B from their AV-8B and F/A-18 legacy platforms demonstrated their amazing feats of work.”*

—Col. Robert Rauenhorst, Commanding Officer of VMX-22



*An F-35B Lightning II lands on the flight deck of the amphibious assault ship USS Wasp (LHD 1) during short take-off, vertical landing operations.*

U.S. Marine Corps photo by Lance Cpl. Remington Hall

complishing all OT-1 objectives onboard Wasp.”

Over the course of 12 days, the Marine Corps and Navy, along with international partners from the United Kingdom, met the following objectives:

- Safely conducted 106 short takeoffs (between 350 feet and 500 feet)
- Safely conducted 100 vertical landings during day and night extended range operations
- Confirmed reliability of Block 2B software configuration

- Confirmed the suitability of F-35B maintenance support equipment for shipboard operations
- Ensured that a six-plane F-35B detachment could fit and operate aboard a Navy amphibious ship
- Safely conducted day and night weapons loading

The Navy made structural modifications to Wasp prior to OT-1, optimizing it as a platform for the F-35B. Modifications included: installing air traffic communications system terminals

stone: the transport of an F135 power module, the largest and heaviest part of the F-35’s engine, from shore to ship in an MV-22 Osprey.

The module and specifically-designed carrier weighed almost 9,000 pounds. Marines and industry partners overcame several engineering and logistical challenges to prove that critical F-35B engine repairs can be accomplished using emerging technology and existing capabilities.

“With the Navy replacing its Carrier

*“According to the current Marine Corps Aviation Plan, the F-35 is slated to completely replace the EA-6B Prowler by 2019 and the AV-8B Harrier by 2026. The legacy F/A-18 Hornet will follow, with a scheduled sundown in 2030.”*

On-Board Delivery aircraft with the V-22, this new capability could enable them to resupply all aircraft carriers and big-deck amphibs with both the F-35B and F-35C engine modules,” said

summer. The declaration had not occurred as of press time July 1.

U.S. Marine Corps Deputy Commandant for Aviation Lt. Gen. Jon Davis directed a team of Marine Corps F-35B

the mission it is assigned,” said Davis. “If the ORI is completed in July, and we are confident that the aircraft are ready for worldwide deployment, then we’ll declare IOC in July. If that doesn’t happen until

## F-35 LIGHTNING II STATS

- Surpassed 30,000 combined flight hours between F-35 military fleet aircraft and System Development and Demonstration (SDD) test aircraft
- Team Luke and Team Eglin each surpassed the 1,000-sortie mark
- F-35 Operational Fleet features 112 aircraft
- F-35 Test Fleet features 18 aircraft
- F-35 Training System qualified 172 F-35 pilots and 1,810 maintainers from U.S. Air Force, Navy and Marine Corps, the Netherlands and the United Kingdom
- Completed multiple weapons tests as well as F-35B and F-35C first-life durability testing
- Conducted two F-35B developmental test (DT) phase shipboard trials aboard USS Wasp (LHD 1) and one F-35C DT phase aboard USS Nimitz (CVN 68)
- U.S. Marine Corps conducted its first F-35B Operational Test (OT) aboard USS Wasp May 18-29
- F-35C will conduct its second DT event later in 2015



*An F-35B Lightning II taxis to be refueled on the flight deck of USS Wasp (LHD 1) during night operations, a part of Operational Testing 1.*

U.S. Marine Corps photo by Lance Cpl. Remington Hall

Jeff Ward, head of F-35B deployment integration for Headquarters Marine Corps. “This is an important accomplishment for the program,” he said.

### **Toward Initial Operating Capability**

Data collected and lessons learned during OT-1 will lay the groundwork for F-35B deployments aboard U.S. Navy amphibious carriers following the Marine Corps’ F-35B initial operating capability (IOC) declaration, scheduled to take place this

experts to carry out a final operational readiness inspection (ORI) in July before the declaration of the first squadron of 10 F-35Bs at VMFA-121 ready for combat use.

The Marine Corps-led ORI team will report the findings of the inspection to Davis. The Commandant of the Marine Corps will then make a decision on whether the F-35B is ready for IOC based on those findings.

“This will be an outcome-based measurement of readiness, assessing whether VMFA-121 as a whole is ready to perform

August, then it will be August. Bottom line is that we won’t rush this; we are doing this the right way.”

Following the Marine Corps’ F-35B IOC declaration, the aircraft will be ready for future operations aboard the Navy’s fleet of amphibious carriers. The first deployment is scheduled to take place in 2017, when VMFA-121 will deploy to Iwakuni, Japan.

“As the Marine Corps supports the president’s strategy to rebalance in the Pacific, we’re bringing the most

advanced technologies and capabilities of our force to the region with the F-35,” explained Davis. “This capability enables our Corps to support regional partners during crises by empowering our forces to perform a wide range of missions across multiple domains. As we modernize Marine fixed-wing aviation assets for the future, the continued development and fielding of the short takeoff and vertical landing Lightning II remains the centerpiece of this effort.”



According to the current Marine Corps Aviation Plan, the F-35 is slated to completely replace the EA-6B Prowler by 2019 and the AV-8B Harrier by 2026. The legacy F/A-18 Hornet will follow, with a scheduled sundown in 2030.

For more information and updates about the Marine Corps’ F-35 program, send queries to [ontherecord@usmc.mil](mailto:ontherecord@usmc.mil).

*Maj. Paul Greenberg is the public affairs officer for the Office of Marine Corps Communication, Marine Corps Headquarters.* ✈️

# A Partnership: US Marine and UK Allies Work Together

*By Maj. Paul Greenberg*  
**USS WASP, At Sea—**

During the first operational test (OT-1) of the F-35B Lightning II aboard USS Wasp (LHD 1) May 18-29, service members from the United Kingdom worked alongside their U.S. Navy and Marine Corps counterparts to assess the integration of the F-35B into amphibious military operations.

“The U.K. team [was] involved in every facet of F-35B maintenance during OT-1,” said U.S. Marine Corps Lt. Col. Michael Dehner, the U.S. Navy’s F-35 operational test director. “That includes avionics, air frames, power lines, quality assurance and flight equipment. They’re going to glean valuable lessons that will be critically

useful as they move from the developmental to the operational phase of F-35B integration.”

Sixteen Royal Navy and Royal Air Force members were embedded aboard the ship during the operational tests. They served as F-35B operational assessors, ship integration team members, aircraft technicians and maintenance crew.

The Royal Navy’s vision for tactical integration of the F-35B into their current arsenal is similar to the Marine Corps’ plan to integrate the F-35B with legacy aircraft, such as the AV-8B Harrier and the F/A-18 Hornet, and gradually phase out those legacy aircraft over the coming decades.

“By 2020, U.K. combat airpower will consist of Typhoon and F-35B Lightning II, a highly potent and capable mix of fourth- and fifth-generation fighter aircraft,” said Royal Navy



*Royal Navy Lt. Cmdr. Neil Mathieson, the U.K.’s F-35 Ship Integration Lead, works with U.S. Marine Corps Staff Sgt. Douglas W. McCarty, during an F-35B ejection seat test and inspection.*

U.S. Marine Corps photo by Maj. Paul Greenberg

Lt. Cmdr. Neil Mathieson, the U.K.’s F-35B ship integration lead. “With Typhoon already established as one of the premier multi-role fighters in the world, the F-35 brings a complementary next-generation level of survivability and lethality. This will ultimately provide the U.K. with an unprecedented level of capability in a single platform.”

U.K. F-35B pilots will begin operating the next generation stealth fighter from home bases in England starting in 2018 and are on track to fly from Queen Elizabeth Class aircraft carriers in 2020.

“United Kingdom participation in the F-35 program has been absolutely critical to our success,” said Lt. Gen. Chris Bogdan, program executive officer for the F-35 Lightning II Joint Program Office. “Since the beginning, U.K. test pilots and engineers have been fully integrated and worked shoulder-to-shoulder with us as we deliver the F-35 to the warfighter.” ✈️

# *First Sea Trials Completed for* **MAGIC CARPET**



U.S. Navy photos by Terri Thomas



*The new heads-up display design includes symbols tailored for shipboard landing.*

*This pilot's view of MAGIC CARPET helps the pilot stay on course and on glide slope.*

**New flight control software completed its first at-sea testing April 20-23 aboard USS George H.W. Bush (CVN 77).**



**T**he Maritime Augmented Guidance with Integrated Controls for Carrier Approach and Recovery Precision Enabling Technologies, or MAGIC CARPET, automatically adjusts the jet's speed and angle of attack in relation to the intended landing surface and includes improvements to the heads-up display, making it easier to land on an aircraft carrier. Initial tests of the system took place in early February at Naval Air Systems Command, Patuxent River, Maryland.

"This was a huge technology milestone in the history of carrier landings," said Navy test pilot Lt. Brent Robinson, MAGIC CARPET project officer. "What we saw at sea was essentially the same as the land-based testing we did at [Patuxent River]."

The flight test team, which included engineers from Naval Air Warfare Center Aircraft Division, the Atlantic Test Ranges and industry partner Boeing, executed more than 180 touch-and-go landings with 16 arrested landings in the advanced control modes during three days of testing. Two aircraft, an F/A-18E and an F/A-18F, were flown in ideal and less-than-ideal approaches and in varying wind conditions.

"This initial sea trial confirmed that carrier landings can be achieved at lower pilot workload while maintaining or reducing current touchdown dispersions performance," said James "Buddy" Denham, a senior engineer in the aeromechanics division at NAVAIR. Touchdown dispersions refer to the differences between the actual and ideal landing points.

The idea for MAGIC CARPET started with a desire to simplify carrier-based air operations and pilots' carrier qualifications (CQ). Landing F/A-18s with current flight-computer software requires adjusting multiple, interconnected variables simultaneously.

"Normally when a pilot is attempting to manage glideslope, lineup and angle-of-attack all at the same time, a change in one of those parameters affects the other two," Robinson said. "MAGIC CARPET lets us unlink those parameters, so when a pilot wants to change glideslope, all he has to do is push or pull on the stick. The system can essentially hold the ideal glideslope for the pilot, so he doesn't have to make very large corrections. When he wants to make lineup changes, all he has to do is move the stick left or right."

The new heads-up display design aided this process, which includes symbols tailored for the shipboard landing task. This effectively enhances the pilot's situational awareness and inputs needed to capture and track those approach parameters, Denham said.

Traditionally, landing an F/A-18 on a moving aircraft carrier requires months of training and hours of qualifications. MAGIC CARPET greatly reduces the amount of time required to qualify a pilot.

"CQs train pilots to learn how to effectively address and adjust each aspect of landing the aircraft," said Denham. "It's like learning how to juggle—you start slowly and work your way up to proficiency. Now, we can let the computer do the work. With this software and 15 minutes in a simulator, we can teach anybody to safely land on a ship."

Test pilots, engineers and landing signal officers (LSO) from Air Test and Evaluation Squadron (VX) 23 will continue to test MAGIC CARPET demonstration software on F/A-18E/F aircraft for the remainder of 2015 and early 2016. Production-level software for the fleet is scheduled to start flight testing in 2017, with general fleet introduction to follow via the F/A-18 and EA-18G program office.

*Jennifer Neal, Naval Aviation News contributing editor, compiled the articles by Mass Communication Specialist 3rd Class Patrick Ian Crimmins, USS George H.W. Bush Public Affairs; and Victor Chen is director of Corporate Communication, Naval Air Warfare Center Aircraft Division at Patuxent River Naval Air Station, Md. 🚀*



*A Naval Air Systems Command engineer tests the MAGIC CARPET control scheme in the F/A-18E/F Flight Simulator at Naval Air Station Patuxent River, Md.*

U.S. Navy photo

# Marines **INNOVATE,** **CREATE** Solutions

## FOR THE FLIGHT LINE

By Jacquelyn Milham



U.S. Navy photo by Jacquelyn Milham

*Brig. Gen. Allan Day, commander, Defense Logistics Agency Aviation, (center with hand raised) asks Lt. Col. Robert Sherwood, MALS-39 Commanding Officer (far left) and Col. Michael Moore, Marine Aircraft Group 39 Commanding Officer (left), about tail rotor blades maintenance procedures and component reliability as Col. Michael Borgschulte, Marine Aircraft Group 39's incoming Commanding Officer, Navy Capt. Rick Taylor, Commander, Naval Air Force Aviation Plans and Policy director, and Rear Adm. Paul Verrastro, commander, NAVSUP Weapon Systems Support, listen.*

Marines from Marine Aviation Logistics Squadron (MALS) 39 shared their stories of how they improved operational readiness for H-1 U.S. Marine Corps Light Attack helicopter squadrons during a Boots on Ground (BoG) visit at Marine Corps Base Camp Pendleton, California, April 27.

**B**oG is a one-day visit by senior leadership and subject matter experts from the Naval Aviation Enterprise (NAE) used to discuss readiness and observe how junior Sailors and Marines are using continuous process improvement (CPI) to support readiness requirements.

“The projects presented today flow from the brief presented [to the Naval Aviation Enterprise Air Board],” said Vice Adm. Mike Shoemaker, commander, Naval Air Force. “It all ties together. The Marines are making our business better; it’s impressive what they’re doing.”

One project involving innovative

changes to helmet extension cables grabbed the attention of a multinational corporation.

A deficit of 83 H-1 cables—used to connect a pilot’s heads-up display to the on-board computer—prompted maintainers to contact the original equipment manufacturer, French multinational corporation, Thales Group. The maintainers believed if they could get the instruction manuals, they could fix the broken cables and alleviate the shortage issue.

They received the manuals within a few weeks, “but they were all in French, and none of us spoke any French,” said Cpl. Clayton Mantz, a microminiature electric cable repair technician who briefed BoG attendees.

Receiving the instructions in a foreign language was frustrating at first, but it didn’t stop them. “We looked at the structure of the cable and how it was being used,” Mantz said. “By reverse engineering it, we learned that the wires inside break when bent at a 90-degree angle, the position that is necessary when the cable is in use.”

With approval from Fleet Support Team, the project resulted in an extension cable designed with a 90-degree angle. Maintainers reinforced the cable with a heavier gauged wire, and replaced the covering with metal-braided sleeves and snakeskin-style insulation. They also manufactured their own cabling boots—the covering at the end of the cable—with heat shrink available at the shop.

Since the new design, there is no longer an H-1 cable deficit. The solution has saved more than 1,000 man-hours and

has a ready-for-issue rate of 99 percent with a cost savings of more than \$1 million over three years.

“We were so successful that Thales sent representatives to learn from us and duplicate our success,” said Mantz.

## Improving Readiness Degraders Top Priority

The helmet extension cable project was one of several shared during the BoG event that demonstrated how creative thinking was used to eliminate barriers and increase readiness.

Lt. Col. Robert Sherwood, MALS-39 Commanding Officer, said MALS-39 Marines continually analyze the causes of H-1’s readiness degraders and seek ways to address those gaps at the intermediate-level repair facility. The command’s logistic philosophy, he said, can be summed up in three words: establish, perfect and push.

First, address readiness gaps or reduce costs by establishing local repair capability. Then perfect, refine and optimize sustainable solutions. And third, push by sharing those solutions with others.

All of MALS-39 CPI efforts are a reflection of that philosophy, Sherwood said.

Another example deals with stub wings, the small wing-like structure found on each side of a helicopter that holds various weapons and missiles. The stub wings were incurring damage when they were removed at the squadrons, said AIRSpeed Chief Gunnery Sgt. Howard Ditson.



U.S. Navy photo by Jacquelyn Milham

*Cpl. Clayton Mantz, an electric cable harness repair technician, holds up a helmet extension cable to explain to Boots on Ground attendees how his work center originated a repair procedure that eliminated a deficit for the cable resulting in a cost savings of more than \$1 million over three years.*

“We worked with them to standardize removal and installation and then walked through the process with them,” Ditson said.

Sgt. Michael Winn, airframes collateral duty inspector, briefed BoG attendees on how MALS-39, under a memorandum of agreement with Naval Air Systems Command (NAVAIR), U.S. Marine Corps Light/Attack Helicopter Program Office (PMA-276) and Naval Supply Systems Command Weapon Systems Support, were able to reclaim 20

wings. “We [were able to give] back three maintenance man-hours per procedure,” Winn said.

To date, MALS-39 has repaired nine stub wings at a cost of approximately \$200 per wing, and they are expected to save approximately \$3 million from their efforts.

## Cadmium Electroplating Capabilities Reduce Costs

In 2012, the flight line experienced a critical shortage of upgraded main rotor gearboxes. The gearboxes, which can be equated to a helicopter’s transmission, were being damaged by water intrusion, cracks and complex repair procedures.

To overcome this, Marine Capt. Gary Pickardt, MALS-39 AIRSpeed officer, said the community implemented several changes including switching to materials that slow down corrosion such as dry film and Thixogrease; implementing cadmium electroplating capability (cadmium serves as a barrier between two different metals to prevent corrosion); and manufacturing a stand to help with maintenance.

Cadmium plating technician Sgt. Carlos Rivera said that it used to take three days for artisans to perform the job at a cost of approximately \$3,000. After receiving training from Fleet Readiness Center Southwest, which made cadmium electroplating a local capability, MALS-39 now has 11 qualified maintainers who can perform the task in four hours.

MALS-39 has performed 95 cadmium electroplating maintenance actions, saving \$284,000 and expects to conduct another 92 cadmium plating jobs in 2015 with expected savings of \$276,000.

In addition, the original equipment



U.S. Navy photo by Jacquelyn Milham

*Vice Adm. Mike Shoemaker (green flight suit), commander, Naval Air Forces, listens to a brief about the H-1 main rotor gearboxes. Due to the continuous process improvement (CPI) efforts of MALS-39, the gearboxes are no longer the H-1’s top readiness degrader.*

*“Decisions that will be in place for decades are being made. We can take the lessons learned here at MALS-39, apply them to other [type/model/series] like the CH-53K and get ahead of those degraders that impact readiness.”*

manufacturer separated the gear box into two repairable components at the suggestion of MALS-39, leading to additional savings of \$900,000, Pickardt said.

To date, the squadron has repaired 10 main rotor gearboxes, saving more than \$10 million.

“Because of CPI, the main rotor gearbox is no longer my top readiness degrader,” said Col. Michael Moore, Marine Aircraft Group 39 Commanding Officer and H-1 type/model/series lead.

Corrosion, however, remains a top readiness degrader for deployed units.

In April 2014, returning H-1s deployed with the 13th Marine Expeditionary Unit (MEU) found mast poles with corrosion on three of its seven aircraft. Aircraft returning from deployment with the 11th MEU in March had the same damage.

Marines see this as an opportunity to implement continuous process improvement while forward deployed, Pickardt said.

Tail rotor blades are another readiness degrader for the H-1s. Repairs for the rotor blades in 2014 cost almost \$30,000, and the original equipment manufacturer was unable to meet fleet demand. Orga-

nizational-level maintainers spent almost 75 percent of their process time waiting for ready-for-issue blades.

After developing procedures and receiving authorization to test the tail rotor blades, MALS-39 reduced turnaround time from an average of four days to one day and extended the service life of 289 blades.

In addition to benefiting H-1 squadrons, leadership is also excited about applying these improvements and process changes to future depots.

“The depots for the CH-53K are being stood up right now,” said Rear Adm. Paul Sohl, commander, Fleet Readiness Centers and assistant commander for Logis-



U.S. Navy photo by Jacquelyn Milham

## **Love of Learning Nets Marine Recognition** *By Jacquelyn Milham*

Staff Sgt. Mario Martinez received the Naval Aviation Enterprise (NAE) Site Visit Excellence Award during the Boots on Ground April 27 at Marine Corps Base Camp Pendleton, California, for his efforts to improve readiness at Marine Aviation Logistics Squadron (MALS) 39.

The award recognizes an individual who has improved command readiness through continuous process improvement (CPI) methodologies and principles. Lt. Gen. Jon Davis, deputy commandant, Marine Aviation, presented the honor to Martinez.

Martinez, who is a communications navigation and cryptograph technician and CPI operations manager, has participated in seven CPI events at the command since 2012.

Martinez said he learns something new every day as a CPI practitioner, and found this to be especially true for the H-1 main rotor gearbox cadmium

electroplating project for which he was recognized.

“I had no idea what the plating even was. I knew nothing about the process,” he said.

But not knowing proved to work in his favor. The more he asked questions, the more work center personnel learned about their work. “I kept asking questions and got them to break down the process to its simplest parts,” Martinez said. “We looked at the process four to five different times to get it just right.”

That perseverance paid off. The team developed a new plating system for the H-1’s main rotor gearbox that reduced the process time by 90 percent, increased readiness and is projected to realize a cost savings of more than \$140,000 in fiscal year 2015.

CPI began to play a role in Martinez’ career shortly after his enlistment in 2005. “I first heard about CPI while serving in Iraq in 2006. We applied “5S” by cleaning up our spaces and designating assigned spots by taping off areas,” he said.

tics and Industrial Operations, NAVAIR, in reference to the Marine Corps' new heavy lift helicopter. "Decisions that will be in place for decades are being made. We can take the lessons learned here at MALS-39, apply them to other [type/model/series] like the CH-53K and get ahead of those degraders that impact readiness."

*Jacquelyn Milham is a communication specialist supporting the Naval Aviation Enterprise public affairs office. 🐦*

*Vice Adm. Mike Shoemaker, left, commander, Naval Air Forces, studies a yoke assembly bushing with Lt. Gen. Jon Davis, deputy commandant for Marine Aviation, during a Boots on Ground event April 28.*

U.S. Navy photo by Jacquelyn Milham



"5S," a philosophy that focuses on workplace organization and eliminating waste, stands for shine, sort, standardize, straighten and sustain with safety often added as the sixth "S."

"I only began to understand the theory behind it after I took white and yellow belt training," Martinez said, "but it really came together during a 2007 green belt course at Marine Corps Air Station Yuma. The green belt course broke it down into basics and showed me its simplicity. It doesn't just apply to any one industry, and can be used for any process. Now I have a specific, scientific approach to making changes."

The training Martinez refers to provides Sailors and Marines a general understanding of CPI concepts (white and yellow belts) while the green belt develops CPI practitioners who can then facilitate improvement projects in their commands. Practitioners who earn their black belts or master black belts are considered experts and provide project support and guidance.

Three years later, Martinez transferred to MALS-39 and was asked by his command in 2012 to become part of its site core team. "I was being offered a chance at getting more education. I love learning and I am always looking for opportunities," he said.

His passion for education is underscored by what he considers his proudest accomplishment at MALS-39—his influence on Marines in his command. "I taught all of the yellow belt courses and I've met a lot of Marines from different backgrounds face-to-face," he said. "When they finally understand CPI, I get to see their bright-eyed look. They know that they can change how they work and have an impact on Marine life. I teach them that it is possible to strive for perfection."

Martinez gets Marines thinking about teamwork as well. "A lot of the success of a project relies on the team itself and can be a matter of getting experts together and functioning as a group," he said. "That is just as important as the process."

Martinez said practitioners should keep it simple when it comes to CPI. "Some Marines who are just starting to use the toolsets can become overwhelmed and confused as to where to start."

"I tell them to focus on the small things. Compounded, they will make a huge difference. They will begin to see that the 'ball'—the scope and impact of the project—will get bigger and bigger as they grow and better understand the toolsets," he said.

Martinez plans to leave the Marine Corps within the next year to pursue a degree in engineering with hopes of becoming a business owner. "CPI revealed my left-brained, statistic side," he said.

"CPI works," he said. "You can apply it to anything if you open your mind, change your way of thinking and take advantage of opportunities."

*Jacquelyn Milham is a communication specialist supporting the Naval Aviation Enterprise public affairs office. 🐦*

# Last Prowler Deployment



Northrop Grumman photo by Edgar Mills

Northrop Grumman photo by Edgar Mills

Rear Adm. John R. Haley, commander, Naval Air Forces, U.S. Atlantic Fleet, shared the value of the EA-6B Prowler to the nation during his remarks June 26 at Naval Air Station Whidbey Island, Wash.

**Editor's note:** Before retiring in June, the EA-6B Prowler conducted its final deployment in 2014 aboard USS George H.W. Bush (CVN) 77. Hear from the crew who reflect on what made the Prowler so special.

“I’m proud of the squadron for concluding the career of the Prowler with honor,” said Cmdr. Christopher “TJ” Jason, Commanding Officer, of Electronic Attack Squadron (VAQ) 134, who has flown in the Prowler as an electronic countermeasures officer since 2000. “I don’t think we could have done anything more to leave a more enduring impression of the excellence of this aircraft than we have.”

As one of its last achievements, the Prowler earned a 100-percent sortie completion rate while being flown by the “Garudas” of VAQ-134 aboard USS George H.W. Bush (CVN) 77. The deployment ended November 2014.

“One of the oldest airframes on the flight deck has executed every single combat

sortie assigned the whole deployment,” said Lt. Winston “Favre” Likert, a pilot who has flown the Prowler for the past three years as part of VAQ-134. “Pretty rare in any squadron. Hornet, Rhino, Prowler, whatever, but for an aging airframe like ours, huge props to our maintenance team to get that done.”

First seeing service in Vietnam, the Prowler made its first flight in May 1968 before going operational in July 1971. It made its first deployment to Southeast Asia in 1972. It saw action in Operation Desert Storm in 1991, supported NATO operations in Bosnia-Herzegovina and Yugoslavia, and enforced no-fly zones around Iraq. In October, during its final deployment with George H.W. Bush, it flew missions over Iraq and Syria.

The Prowler will be replaced by the EA-18G Growler, a variant of the F/A-18F Super Hornet.

“We’re actually flying the Prowler longer than the Navy intended,” Jason said.

“It’s a Vietnam-era design,” Likert said. “It’s a completely different generation of

aircraft all together. It’s all manual bell-cranks and pulleys and hydraulics.”

“The Prowler’s return on investment is fantastic,” said Capt. Daniel “Undra” Cheever, commander, Carrier Air Wing (CVW) 8. “It’s a testament to its design and its relevance that it’s still being used.”

But nothing lasts forever.

“The longer you keep an airframe going past its intended lifespan, the higher the cost,” Jason said.

Both Cheever and Likert describe the Prowler as similar to a ‘57 Chevrolet: simple, powerful and beautiful in its own way, but hard to compare to something like a Corvette, or, in the Prowler’s case, the EA-18G Growler.

Jason said the Prowler is a traditionally built, metal aircraft, unlike other airframes, which are primarily modularly constructed from composite materials. A unique aspect about working on the Prowler is how the mechanics can fix a problem on deployment rather than get a new part shipped in.

“If they need to fabricate a component, they’re going out there and bending sheet metal to make it match,” Jason said. “They will create it. So, that is going to be a lost art.”

A more modern aircraft can tell a mechanic through electronic codes where problems might be, Likert said. Over the years, Prowler mechanics have developed an intuition to tell from a pilot’s observations which issues need troubleshooting.

“There’s a lot to it, but it’s easily understandable,” said 21-year-old Aviation Mechanic 3rd Class Jason Lee Gregory. “If you sit back and think about it, you can figure out what’s going wrong with it.”

“It is a 40-plus-year-old airframe,” Cheever said. “It is not designed with all the new technology we have today.”

Prowler pilots are more dependent on their own strength and situational awareness than in modern airframes because

# Remembered

By MC Patrick Ian Crimmins



The U.S. Navy's last operational EA-6B Prowler lifts off from Naval Air Station Whidbey Island, Wash., in a ceremonial fly-away June 27 from its long time operational base. The Navy is retiring the Prowler after nearly 45 years of service.



Northrop Grumman photo by Brooks McKinney

After its final take-off, the EA-6B Prowler hooks up with two EA-18G Growlers for a final flyover of Naval Air Station Whidbey Island, Wash.

they don't have electronically assisted controls or air-to-air radar.

"It's a very physically demanding aircraft to fly," said Likert. "You don't have computers making up the gaps, it's all you. It's exhausting to fly, but that makes it endearing, like grabbing the beast by the scruff of its neck."

Cheever said he agrees that the source of the Prowler's success lies in the people who surround it. Everyone involved with the Prowler, from its design phase to its implementation over the years, are responsible for the jet's achievements, he said.

"The overarching message is, 'It's all about the team,'" Cheever said.

When published in November 2014, *Mass Communication Specialist Seaman Patrick Ian Crimmins served as a public affairs officer assigned to USS George H.W. Bush (CVN 77).* ✈️

## Prowler Test Pilot Comes Full Circle *By MC2 John Hetherington*

Electronic Attack Wing, U.S. Pacific Fleet (CVWP), hosted a three-day sunset celebration commemorating the retirement of the Navy EA-6B Prowler June 25-27 at Naval Air Station Whidbey Island's (NASWI) Ault Field in Oak Harbor, Washington.

"We've been able to see people we haven't seen in 35, 40 years or so, including some of the original people from Grumman who designed the system," said retired Capt. Fred Wilmot, who served as a test pilot for the Prowler and delivered the first one to NASWI while serving in Electronic Attack Squadron (VAQ) 129 in January 1971. "It's really a fitting end to the Prowler era."

Wilmot credited the lengthy service of the Prowler to multiple factors.

"The fact that the Prowler stuck around for 45 years is testimony to how well it was designed and built, and the thousands of men and women who have maintained and operated it," Wilmot said.

The farewell ceremony featured speeches, a recitation of the names of VAQ Sailors who sacrificed their lives in service, and a missing man formation.

Wilmot rode in the formation for the fly off of the last Prowler. "I feel extremely fortunate that I was able to take the opportunity to fly in the last flight away since I brought the first flight in," Wilmot said.

Capt. Darryl Walker, CVWP commander, said he feels fortunate to have led his community through this major transition.

"We've sunset our last Navy Prowler with VAQ-134, so the entire community will now be transitioned to the EA-18G Growler," said Walker. "It's really spectacular to see the community grow into the fantastic airplane, the EA-18G Growler."

*Mass Communication Specialist 2nd Class John Hetherington is a member of the Navy Public Affairs Support Element West, Det. Northwest.* ✈️



*Guest speaker Vice Adm. Paul Grosklags addresses an audience during a sundown ceremony for the SH-60B Seahawk helicopter May 11 at Naval Air Station North Island, Coronado, Calif. The ceremony commemorated 30 years of active service for the SH-60B.*

U.S. Navy photo by MC2 Stephanie Smith

## NAVY HOLDS SUNDOWN CEREMONY FOR

# SH-60B Seahawk

By Naval Air Force Pacific Public Affairs

Helicopter Maritime Strike Wing Pacific hosted a sundown ceremony for the SH-60B Seahawk helicopter in Helicopter Maritime Strike Squadron (HSM) 73's hangar at Naval Air Station North Island, Coronado, California, May 11.

Active duty service members, retirees, and visitors were in attendance as leadership from the helicopter community provided remarks regarding the SH-60B's 30 years of active service in the fleet.

The ceremony's guest speaker, Vice Adm. Paul A. Grosklags, principal military deputy, assistant secretary of the Navy for Research, Development and Acquisitions, reflected on the life of the aircraft.

"In the '80s and '90s, when we often didn't have an aircraft carrier in the Arabian Gulf, that surface combatant with

its one or two embarked SH-60s were the eyes and ears of the fleet and our nation in that very volatile and challenging part of the world," said Grosklags. "In the '90s and the 2000s, when humanitarian missions arose, whether in our own backyard such as Haiti, or on the other side of the world in the Philippines, Indonesia or Japan, there was always an SH-60B on scene."

The SH-60B joined the operational fleet in 1985 when the aircraft made its initial deployment with a Helicopter Anti-Submarine Squadron Light (HSL) 43 detachment aboard the guided-missile frigate USS Crommelin (FFG 37).

Since joining the fleet, the aircraft has completed more than

3.6 million flight hours in support of operations and training.

The last active-duty SH-60B detachment, which was a detachment from HSM-49 at Naval Air Station North Island, returned from a seven-month deployment aboard the guided-missile frigate USS Gary (FFG 51) to the U.S. 4th and 3rd Fleet area of operations April 17.

"We are here today to salute the SH-60B as it departs our flight lines," said Grosklags. "But in the end, this community has not been just about the aircraft, it's really been all about the people—that aircrewman delivering the water, the pilots flying that aircraft and certainly the maintenance professionals making sure the aircraft was available and ready to fly."

The ceremony concluded after an SH-60B and an MH-60R Seahawk conducted a fly-by of HSM-73's hangar to represent a change of watch for the aircraft.

The SH-60B is being replaced by the MH-60R, which is capable of executing the same missions as the SH-60B, but with significant advancements in mission systems that dramatically enhances its effectiveness. MH-60R aircraft carry out various missions including anti-submarine warfare, anti-surface warfare, vertical replenishment, search and rescue, humanitarian relief and medical evacuation. ✈️

*"We are here today to salute the SH-60B as it departs our flight lines," Grosklags said during the sundown ceremony May 11. The SH-60B joined the operational fleet in 1985 when the aircraft made its initial deployment with a Helicopter Anti-Submarine Squadron Light (HSL) 43 detachment aboard USS Crommelin (FFG 37).*



U.S. Navy photo by MC2 Stephanie Smith

# Navy Says Goodbye to Sunsetting



*Chief Aviation Structural Mechanic Eddie Carranza signs aircraft 916, a P-3C Orion maritime patrol aircraft from the "Golden Eagles" of Patrol Squadron (VP) 9, before it goes into retirement.*

U.S. Navy photo by MC3 Amber Porter

Across the fleet, wistful pilots are bidding a fond farewell to the P-3C Orion, which after more than five decades as the U.S. Navy's maritime patrol aircraft is making way for its upgraded successor, the P-8A Poseidon.

**B**ased out of Naval Air Station Jacksonville, Florida, Patrol Squadron (VP) 26 "Tridents" are currently flying missions in the U.S. Fifth Fleet, the Navy's final East Coast active duty deployment of the P-3C.

"It's incredible and it means being a part of history," said Lt. Cory Solis, VP-26 tactical coordinator. "The plane has been a fighting force for the Navy for so long and we're still able to employ it. We can still count on her to get up in the air and be vital part of something like what we are doing now in the Middle East."

Debuting in August 1962, the P-3 platform went through three major models, culminating in 1969 with the arrival of the P-3C, the only version still flying today.

The current P-3C is equipped with the latest in Command, Control, Communications and Computer (C4) technology, enabling it to integrate with other forces and to facilitate network-centric warfare. The P-8A is designed to take these capabilities to the next level.

"During the P-3's 50 years of service, it has flown countless hours over land and sea, all while maintaining an excellent service record," said Capt. Scott Dillion, program manager for the Maritime Patrol & Reconnaissance Aircraft (PMA-290) program office. "As we transition to the P-8, we look to continue the tradition that the Navy's current workhorse, the P-3, has set in place."

"The P-8A Poseidon brings a more advanced, more effective, and more integrated sensor suite, an extended global reach, a

greater payload, and a significantly greater capacity for future capability growth," he said. "P-8A improves upon the legacy of its predecessor with greater range, endurance, speed and reliability. Two P-8A aircraft can accomplish the same mission as three P-3C aircraft."

## On the Other Side of the World

After 42 years of service, the P-3C designated as aircraft 916 took its final flight March 27 with the "Golden Eagles" of Patrol Squadron (VP) 9 from their home station in Kaneohe Bay, Hawaii, over the Pacific to the 309th Aerospace Maintenance and Regeneration Group (309 AMARG) at Davis-Monthan Air Force Base in Tucson, Arizona, also known as "The Boneyard."

"It was an honor to be a part of 916's last voyage," said Lt. Emily Cordle, a pilot on the REPO (reposition) flight. "The entire crew couldn't help but reflect on the countless missions she has flown, the numerous crew members she has carried, and the endless maintainers that have kept her flying for 42 years."

Touted on its website as "the largest aircraft boneyard in the world," 309 AMARG is a one-of-a-kind specialized facility within the Air Force Material Command structure. Responsible for the storage and maintenance of aircraft for future redeployment, parts, or proper disposal following retirement by the military, the 2,600-acre field is home to 4,400 aircraft and 13 aerospace vehicles from the Air Force, Navy, Marine Corps, Army, Coast Guard and NASA.

# P-3C Orion



Retired P-3C Orion maritime patrol aircraft are used to support active military planes at the 309th Aerospace Maintenance and Regeneration Group (309 AMARG) at Davis-Monthan Air Force Base in Tucson, Ariz.

U.S. Navy photo by MC3 Amber Porter



A retired P-3C Orion maritime patrol aircraft is propped up on blocks in a preservation state March 31 at the 309th Aerospace Maintenance and Regeneration Group (309 AMARG) at Davis-Monthan Air Force Base in Tucson, Ariz.

U.S. Navy photo by MC3 Amber Porter

Traffic to the boneyard is expected to be steady for VP squadrons as the Lockheed Martin-built P-3C is phased out and they adjust to the P-8A, a modified Boeing 737-800ERX.

The Navy plans to purchase 117 P-8As through fiscal 2018 as half of its plan to replace roughly 225 P-3Cs. Nearly 100 P-3Cs have been decommissioned over the last decade, and the last Orion is expected to retire in 2023.

Being scrapped for parts or otherwise left in an open field to roast under the scorching Arizona sky might seem like an unbefitting conclusion to the Orion's story, but the tired aircraft has earned its retirement—the current fleet of P-3Cs average more than 17,000 hours of flight time, well beyond the aircraft's planned fatigue life of 7,500 hours.

Besides, no erosion can destroy the aircraft's lasting influence in history. During its 50-plus years of service, the Orion flew in support of U.S. operations during the Cuban Missile Crisis, Cold War-era anti-submarine warfare missions, Desert Shield and Desert Storm, the Balkan crisis, Operation Allied Force, Operation Enduring Freedom, Operation Iraqi Freedom, and most recently, Operation Odyssey Dawn in Libya.

Transitioning to a new aircraft goes beyond using its physical capabilities and technology.

“This flexibility is one of the hallmarks of U.S. Naval service. However, it is not the airframe that provides this flexibility. It is the people,” Smith said. “The same people who are making P-3s succeed on station will be the ones who make the P-8 succeed on station. The airframe will change, but the culture and legacy of excellence in maritime patrol and reconnaissance will remain.”

Personnel are already preparing for the road ahead. Sailors will have to adjust, retrain, and in some cases, find a different career path in the Navy.

All maintenance Sailors will be required to attend the P-8 general familiarization course, which lasts between five to 10 days. They will also be required to attend P-8 rate training. Upon completion, they will be assigned to Fleet Replacement Squadron, VP-30, in Jacksonville, and work in their rating specific area to become qualified collateral duty inspectors (CDI) and plane captains on the P-8 for approximately six months.

“You either ride the waves of change or drown beneath them,” VP-26 Command Master Chief James B. Daniels Jr., said. “The point is, change is going to happen whether you like it or not. The P-8 is a new, more capable aircraft, and as we did with the P-3, we will maximize the use of it to further the Navy's mission.”

The new P-8 aircraft is expected to arrive in Bahrain in about one year.

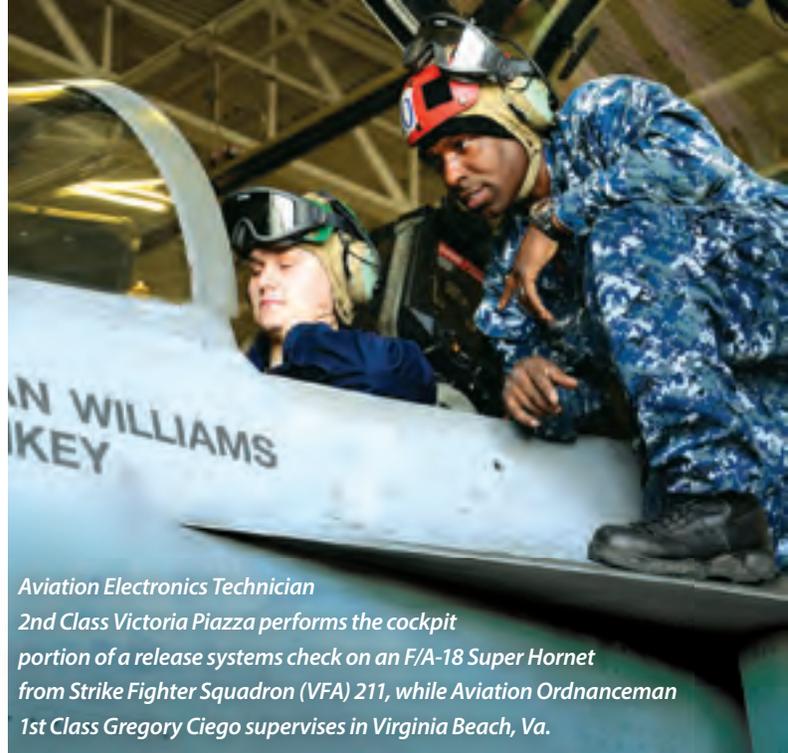
“I am extremely proud of what the men and women of VP-26 do every day,” Smith said. “To me, the last P-3 deployment from the East Coast will always imply the additional work and sacrifices required to do more with less, and meeting mission in spite of those challenges, the way VP-26 has always done before.”

Jeff Newman, Naval Aviation News staff writer and contributing editor, compiled the articles by Mass Communication Specialist 1st Class Steve Smith, previously stationed at Naval Support Activity Bahrain Public Affairs; and Mass Communication Specialist 3rd Class Amber Porter, stationed with Patrol Squadron (VP) 9 Public Affairs at Kaneohe Bay, Hawaii. 🇺🇸



Aviation Electronics Technician 2nd Class Nick Lacey, assigned to Helicopter Sea Combat Squadron (HSC) 15, inspects the electrical system of an MH-60S Seahawk helicopter Feb. 28 in USS Carl Vinson's (CVN 70) hangar bay in the Arabian Gulf.

U.S. Navy photo by MC2 John Philip Wagner, Jr.



Aviation Electronics Technician 2nd Class Victoria Piazza performs the cockpit portion of a release systems check on an F/A-18 Super Hornet from Strike Fighter Squadron (VFA) 211, while Aviation Ordnanceman 1st Class Gregory Ciego supervises in Virginia Beach, Va.

U.S. Navy Photo by AT2 Janel Perkins

# Aviation Electronics Technicians Tackle Everything Aviation

By ATCS Jessica Miller

Sometimes it feels as though the Navy's AT rate should stand for aviation-everything technician because an Aviation Electronics Technician's duties cover the electronic systems and subsystems of all naval aircraft and often cross into other rates.

levels covered by the rate: the intermediate, or "I" level, and the organizational, known as the "O" level. While there is a third, few Sailors work at that level.

O-level, also known as "on bird" maintenance, is performed at the squadron level. Here we work on the aircraft itself, troubleshooting systems such as radar, navigation, fire control and signal jamming. Considering the number of types, models and series of aircraft in the naval inventory—each with its own systems—one can begin to appreciate the sheer number of systems the AT rate encompasses.

ATs also troubleshoot to determine which component is faulty, replace it and turn the broken component in to the local intermediate-level facility for repair. In a squadron, ATs must also qualify to perform regular day-to-day aircraft maintenance

While we do not perform the jobs of other rates, the equipment we maintain touches other areas such as hydraulics and aviators' breathing oxygen. We also help maintain the equipment used by other aviation maintenance rates.

This broad spectrum is a result of the two

such as fueling, daily inspections, runway taxiing and aircraft washing.

Intermediate-level maintenance is usually performed at a shore-based Fleet Readiness Center or the Aircraft Intermediate Maintenance Department on afloat units. The broken components get repaired at different shops such as: micro and miniature circuit repair shops for any soldering repairs; radar shop, shared reconnaissance pods shop or a generic consolidated automated support system (CASS); and various electronic gadgets shops for other items not requiring a high power or laser setup such as can be seen in our Advanced Targeting Forward-Looking Infrared (ATFLIR) shop.

The calibration lab is a unique work center where ATs do not work on actual aircraft parts, but calibrate and repair any and all equipment that takes a measurement. We calibrate pressure gauges from engineering and air departments, oxygen gauges from Aircrew Survival Equipmentmen (PR), the Jet Engine Test cell for Aviation Machinist Mates (AD), servocylinder test stand for Aviation Structural Mechanics (AM), and support equipment pre-oilers, or PON6, for the Aviation Support Equipment Technicians (AS), to name a few.

ATs have their hands in every aspect of aircraft maintenance, and this rate is so diverse that at one time it had 85 individual Navy Enlisted Classifications.

The Aviation Electronics Technician rate offers a challenging and diverse career path that opens up numerous opportunities in the civilian sector.

ATCS Jessica Miller is an Aviation Electronics Technician Senior Chief stationed in Norfolk, Va. 🦅



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- **FRC Southwest (North, CA):**  
FRCSW\_HR\_STAFFING/RECRUITING@navy.mil
- **FRC Mid-Atlantic (Oceana, VA):**  
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**NOTE:** Vacancies may not exist in every job series at all times or at all sites. U.S. Citizenship and the ability to obtain and maintain a security clearance are required for all positions

# Professional Reading

By Cmdr. Peter Mersky, USNR (Ret.)



## **AV-8B Harrier II Units of Operation Iraqi Freedom I-VI**

Lon Nordeen. Osprey Publishing Ltd, Oxford, UK, and New York, NY. 2013. 96 pp. Ill. \$22.95.

American Harriers, a major part of the U.S. Marine Corps order of battle since 1971, have seen sustained combat in three major campaigns: Desert Storm, Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). The AV-8B was also involved in the Balkans campaign in the late 1990s. Likewise, British Harriers were late in starting their wartime service, beginning with the Falklands Conflict in 1982, then in the Balkans. Royal Air Force Harriers participated in the early stages of OIF in 2003 and then OEF in 2004. But, with major British reductions and decommissioning of Harrier squadrons and the ships they sailed on, British Harriers did not fly any more sorties in Southwest Asia.

Lon Nordeen is in the midst of writing a trilogy on Marine Corps Harri-

ers in Iraq and Afghanistan. This latest book is the second, and like its predecessor that dealt with Desert Storm, is full of detail and descriptions of this unique fighter-bomber and its crews. A little out of order, but perhaps the most detailed section is the appendix, which shows the varied deployments of AV-8B squadrons—a Herculean effort to bring together the squadron and detachment assignments afloat and ashore. It took an obvious amount of research by both author and editor to compile this very helpful listing.

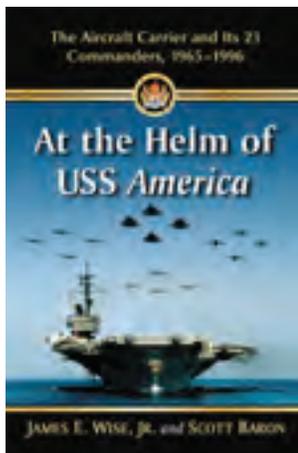
As the next generation of close air support, the Harrier is at the heart of Marine Corps aviation; protecting ground troops. The Harrier has proved its worth and validated the far-seeing, often contested, vision of such forward thinkers as Lt. Gen. Tom Miller, who saw the value in close air support when situations demanded quick response.

The photographs selected show many of the pilots and ground crew that kept the AV-8B and its derivatives flying during demanding fighting in Iraq. (The third volume will describe operations in the equally challenging campaign in Afghanistan.) Also included are profiles of the different types of ordnance used by the Harrier, which will certainly be of interest to modelers and historians alike. Artist Gareth Hector's striking cover illustration is also an important feature. ✈



Photo by Capt. Michael Black

Marine Attack Squadron (VMA) 311 "Det A" pilot Capt. Michael Black took this self-portrait over Iraq April 4, 2003.



## *At the Helm of USS America*

Jame E., Jr., Wise and Scott Baron. McFarland & Company, Inc., Jefferson, NC. 2014. 242 pp. Ill. \$45.

Retired Capt. Jim Wise was an experienced naval aviator. He had even flown PB4Ys into South Vietnam as part of U.S. aid to the beleaguered French in the 1950s. Later, he served as the USS America's (CV 66) intelligence officer,

working with retired Capt. Don Engen, who, during World War II, was one of the Navy's youngest aviators. The two men made the ship's second Mediterranean deployment in time to be involved in the Liberty Incident in June 1967.

Wise, best known for his multi-volume set of books for the Naval Institute detailing the military careers of celebrities, was working on this book when he died unexpectedly in 2013.

His co-author, Scott Baron, took on the project and followed it through to completion.

The result is an informative collection of 23 aviator biographies—the men who captained the carrier in peace and war. Though sparsely illustrated, the book is full of personal resumes, all of which would do anyone proud. Along with Vice Adm. Donald D. Engen, men like Adm. Thomas Hayward (a former Chief of Naval Operations), Adm. Leighton “Snuffy” W. Smith, Vice Adm. Richard C. Allen, Vice Adm. John Mazach and others, the book offers a veritable encyclopedia of post-World War II leaders.

It's a different presentation that I wish had been better produced, certainly for the price. Nonetheless, the book is a good reference, devoted to one of this country's most beloved aircraft carriers of the post-Korean War era. Often appearing in the midst of a crisis as the proverbial “tip of the spear,” the America has a large family of alumni. Many Navy carrier veterans served aboard the carrier deploying from the Mediterranean to Vietnam and Libya to the Persian Gulf. So, this book should have a lot of personal appeal along with its interesting collection of individual histories of some of the Navy's greatest senior aviators. 🇺🇸



*During workups to their 1986 Libya deployment, the crew of a Fighter Squadron (VF)102 F-14A launches from one of USS America's waist catapults.*



*In the groove: shot by the forward-firing KA-45 camera of an RF-8G of Photographic Reconnaissance Squadrons Light (VFP) 306 during carrier qualifications aboard USS America.*

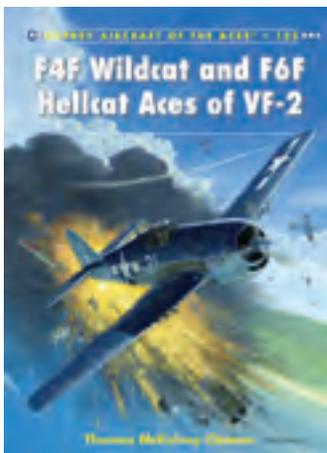


U.S. Navy Photo

A Fighter Squadron (VF) 2 Hellcat moments away from catapulting from USS Hornet's flight deck May 6, 1944. Note the weathered condition of this F6F and the cordite stains on the wing showing the guns have been recently fired.

### **F4F Wildcat and F6F Hellcat Aces of VF-2**

Thomas McKelvey Cleaver. Osprey Publishing New York. 2014. 96 pp. Ill. \$22.95.



Known as the “Flying Chiefs” before World War II because the majority of its pilots were enlisted Naval Aviation Pilots (NAPs), Fighter Squadron (VF) 2 took on the more traditional composition of a Navy squadron after the U.S. entry into the war, with pilots being commissioned officers from ensign to commander. VF-2 participated in action immediately after the Japanese attack on Pearl Harbor flying the Brewster F2A Buffalo, and during the Battle of the Coral Sea in May 1942. By this time, the squadron transitioned to the Grumman F4F Wildcat. Several young squadron members saw their first combat action in these early engagements, gaining invaluable fighting and leadership experience that would help them in their careers.

The author gives a good rundown of the squadron's prewar activities, flying early bi-plane fighters and the early transition to the

Buffalo. The book's profiles even show off a few of the colorful between-war fighters—the Curtiss F6C Hawk and the Boeing F4B. It is rare to see these colorful aircraft in a profile lineup.

Most of the text is, naturally, about VF-2's World War II exploits. As the author points out, VF-2 had more aces (28) than any other Navy squadron. Even first-time aces scored against the feared Zero, along with the often-encountered Val dive bomber, and the Emily and Mavis flying boats—among the hardest to shoot down.

There is also a discussion about Capt. Miles Browning, one of the greatest operators in the first year of the war in the Pacific, but sadly, one of the most hated because of his terrible lack of leadership style.

This volume, number 125 in Osprey's wildly successful Aircraft of the Aces series, is a fine addition. ✈

# Squadron Spotlight

## Strike Fighter Squadron (VFA) 195 "Dambusters"

**Founded:** August 1943

**Based:** Naval Air Facility Atsugi, Japan

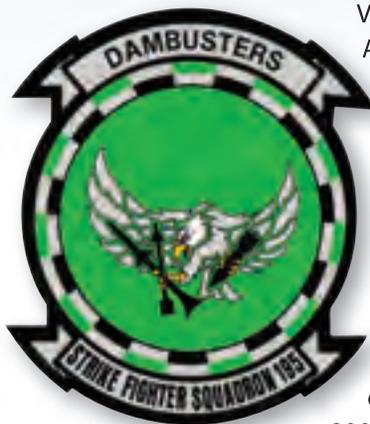
**Current Commanding Officer:**

Cmdr. Guy "Bus" Snodgrass

**Mission:** *First, to be forward deployed warriors for our nation, and when required, provide superior airpower where it matters, when it matters to achieve our nation's objectives. Second, to represent the United States of America as forward deployed ambassadors of liberty.*

**Brief History:** VFA-195 was originally commissioned as the "Tigers" of Torpedo Squadron (VT) 19 at Los Alamitos, California, August 1943, flying the Eastern TBM Avenger. The squadron participated in the Battle of Leyte Gulf and in support of the landings on Guam, Palau, Morotai and Leyte. VT-19 was redesignated Attack Squadron (VA) 20A following World War II in November 1946.

In May 1947, VA-20A transitioned to the Douglas AD-1 Skyraider before being redesignated VA-195 in August 1948. While deployed aboard USS Princeton, the squadron provided close air support for U.S. Marines trapped near the Chosin Reservoir. During this period, the squadron earned its new nickname, 'Dambusters', when their Douglas AD-4 Skyraiders delivered precise low-level aerial torpedoes against the heavily defended and strategically positioned Hwachon Reservoir dam May 1, 1951. Widely considered as one of the most extraordinary strikes of the war, destruction of the dam flooded the valley below, protecting allied flanks while denying the North Koreans control of the reservoir's waters for the remainder of the war.



VA-195 transitioned to the jet powered Douglas A-4 Skyhawk in July 1959 and moved to Naval Air Station Lemoore, California, in 1962. In the spring of 1970, VA-195 transitioned to the Vought A-7E Corsair II as part of Carrier Air Wing (CVW) 11.

The Dambusters were redesignated Strike Fighter Squadron (VFA) 195 in April 1985 and transitioned to the F/A-18 Hornet. VFA-195 was subsequently assigned to CVW 5 and officially joined the forward deployed naval forces in Yokosuka, Japan. In 2001, the Dambusters, embarked onboard USS

Kitty Hawk (CV 63), flew in support of Operation Enduring Freedom, and in 2003, flew in support of Operation Iraqi Freedom. In 2008, the squadron cross-decked to the first nuclear powered aircraft carrier stationed in Japan, USS George Washington (CVN 73). In 2011, the squadron made its first return to the U.S. in 25 years to transition to the F/A-18E Super Hornet. Today the squadron continues to deploy aboard USS Ronald Reagan (CVN 76), providing formidable forward presence in the Western Pacific.

**Aircraft Flown:** F/A-18E Super Hornet

**Number of People in Unit:** 231 military personnel

**Significant Accomplishments:**

- **Recent Detachments:** Tactical training in Fallon, Nevada, and field carrier landing practice on Iwo To, Japan
- **Exercises:** Talisman Saber 2015; Valiant Shield 2014; Keen Sword 2014
- **Awarded:** Retention Excellence Award, Meritorious Unit Commendation, Medical Blue "M."



U.S. Navy photo



# ***NAVAL AVIATION NEWS***