
**NAVAL AVIATION NEWS**

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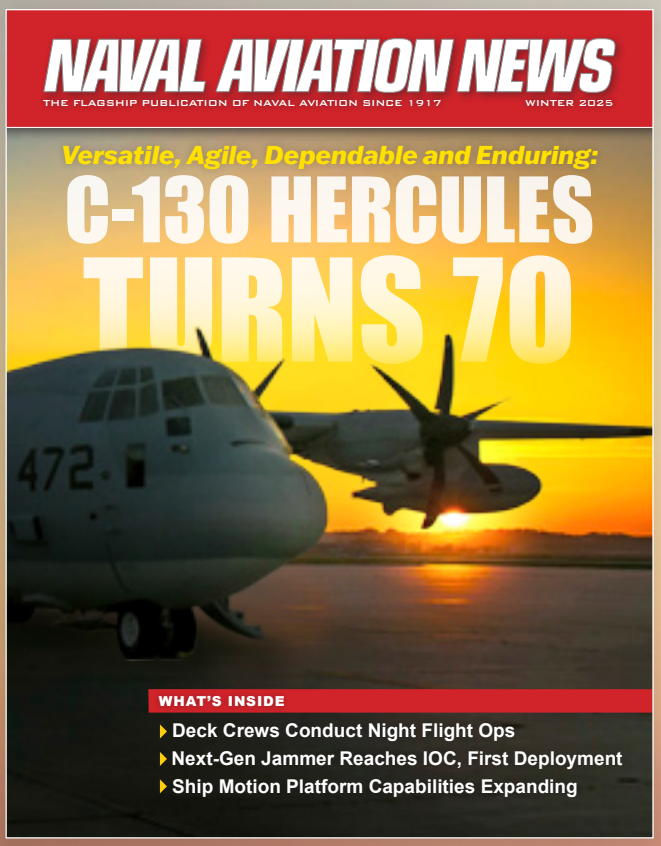
NAVAL AVIATION NEWS
THE FLAGSHIP PUBLICATION OF NAVAL AVIATION SINCE 1917
SPECIAL EDITION

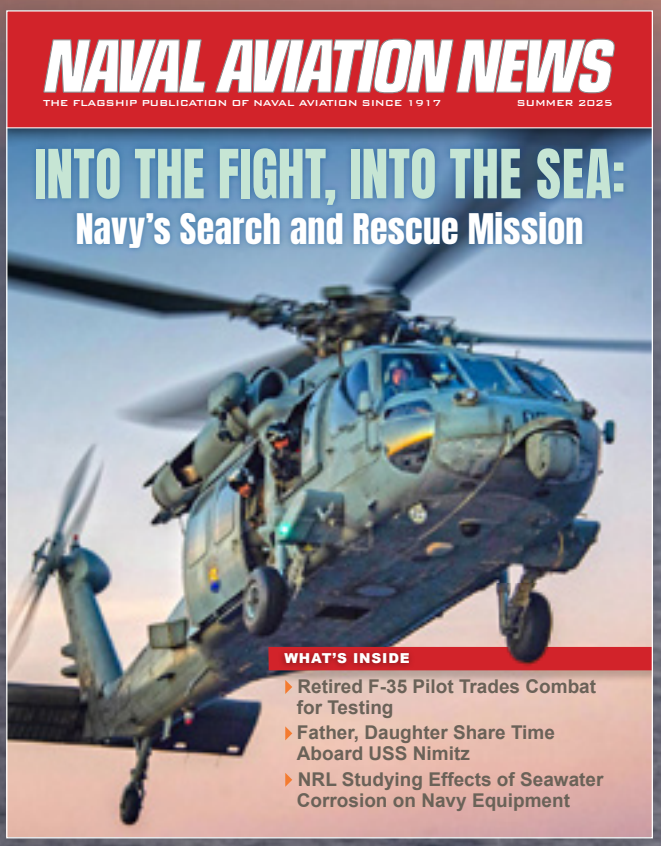
# 2025 YEAR IN REVIEW

## MILESTONES IN NAVAL AVIATION




Winter 2025


Spring 2025




Summer 2025


Fall 2025

# NAVAL AVIATION NEWS

2025 Year in Review — Special Edition

## EDITOR'S NOTE

***Welcome to the third annual year in review edition of Naval Aviation News.***

*As we close out another remarkable year, let us take a moment to reflect, not just on the milestones and success stories, but also on the spirit of innovation, resilience and service that defines our Naval Aviation community. This year's stories span decades of achievement and highlight the people, platforms and partnerships that continue to keep Naval Aviation at the forefront.*

*We begin with a true giant: the C 130 Hercules. At 70 years old, the Hercules remains as versatile, agile, dependable and enduring as ever. Its longevity is more than a testament to engineering; it also reflects the commitment of the aviators and maintainers who keep it mission ready.*

*Innovation also took center stage as VAQ-133 completed the fleet's first deployment of the Next-Generation Jammer. This milestone marked a leap forward in airborne electronic attack capability and underscored the Navy's dedication to staying at the lead of a contested electromagnetic environment.*

*This year, we also celebrated eight decades of the U.S. Naval Test Pilot School producing the world's finest test pilots, flight officers and engineers. Their work continues to push boundaries, ensuring every aircraft and system meets the highest standards before reaching the fleet.*

*From the labs of the Naval Research Laboratory—where scientists safeguard naval assets across land, sea and air—to the flight line, where the Super Hornet marked 30 legendary years, this issue showcases the full spectrum of Naval Aviation's impact and influence.*

*Perhaps most important, we also honor the people behind the mission: sailors celebrating 250 years of service at sea and ashore, the lifesaving heroics of HSC 25's search and rescue teams, the critical role fiber optic tech plays in modern avionics and the harrowing account of a sailor's fight for life in the eye of a storm.*

*Finally, we look toward the future with the Navy's Joint Simulation Environment, where Marines and airmen trained together as a joint force for the first time to prepare for the challenges ahead.*

*Thank you for joining us in celebrating a year defined by progress and collaboration. As Naval Aviation's story continues to be written, we cannot wait to share the next chapter with you.*

*— Emily Funderburk, Editor, Naval Aviation News*

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***On the cover:*** *A Marine Corps KC-130J with Marine Aerial Refueler Transport Squadron 234, Marine Aircraft Group 41, 4th Marine Aircraft Wing, is refueled during exercise Intrepid Maven Oasis Aug. 5, 2024.* U.S. Navy photo illustration by Fred Flerlage; imagery by Marine Corps Sgt. Angela Wilcox

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

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*A U.S. Marine Corps MV-22 Osprey helicopter with Marine Medium Tiltrotor Squadron 263 (Reinforced), 22nd Marine Expeditionary Unit (Special Operations Capable), prepares to land aboard amphibious assault ship USS Iwo Jima (LHD 7), during onload operations while underway in the Atlantic Ocean, Aug. 16.*

# Versatile, Agile, Dependable and

# C-130 HERCU

*A KC-130J Hercules with Special-Purpose Marine Air-Ground Task Force Crisis Response-Africa rests on the flight line near Madrid, Spain, March 16, 2015.*

U.S. Marine Corps photo by Sgt. Paul Peterson

# Enduring:

# LES TURNS 70

*By Sean Scriber*

**The C-130 Hercules has been answering the call to defend the U.S. since Aug. 23, 1954, providing tactical airlift, humanitarian aid, air support and various other missions. Initially designed to be a medium cargo plane able to land in short, confined runways, the Hercules is used in more than 70 countries with more than 1 million flight hours. Last year marked the 70th year the C-130 has been in flight, and the aircraft continues to reach new heights.**

The nature of war has changed in the past seven decades, and the Hercules has evolved alongside it, while maintaining its strength and iconic four turboprop engines. The Hercules not only serves as a military vehicle; it also serves in humanitarian aid and has been a part of U.S. international relations. This platform has the honor of having generations of pilots operating it. This legacy has passed from parents to their children, from the aviators of yesterday to the aviators of tomorrow. Produced longer than any other platform, the aircraft dubbed the "Four Fans of Freedom" by Dr. Douglas Kennedy, assistant professor of history at the U.S. Air Force Academy, continues to soar the skies to protect life, liberty and freedom.

Photo courtesy of National Archives & Records Administration (NARA)

*A C-130 flies over Naval Air Station Patuxent River, Maryland, April 16, 1967.*

**"The C-130 has had more than 70 variants, 15 of which are produced by Lockheed Martin. From aerial command centers to weather observation and, on occasion, an aerial drone carrier, the Hercules performs its eclectic missions."**

Photo courtesy of NARA

*A C-130 tanker/transport aircraft refuels an RF-86 Crusader fighter aircraft over the Gulf of Tonkin, March 17, 1971.*

The C-130 has had more than 70 variants, 15 of which are produced by Lockheed Martin. From aerial command centers to weather observation and, on occasion, an aerial drone carrier, the Hercules performs its eclectic missions. The timeless design of the plane has allowed C-130s to be modified with pontoons for aquatic landings or sleds for scientific explorations in the Artic tundra. It has lent its services to nearly every mission capability needed for military or civilian applications.

The Hercules was introduced to the Navy in 1960 to assist in Antarctica. Since then, the platform has traded its sled landing gear for external fuel tanks. While the Navy uses the T model, the KC-130J Super Hercules has become a standout for the Marine Corps. This "super" plane takes the cargo capabilities of its other C-130 siblings and ups the ante by refueling helicopters, fixed-wing and tiltrotor aircraft mid flight. Equipped with extensive hoses and massive external fuel tanks, the Super Hercules supports an array of missions across U.S. naval forces and is an integral part of tactical advantage and mission success.

Photo courtesy of NARA

Photo courtesy of NARA

*Fat Albert, the C-130 Hercules aircraft used to transport equipment, fuel and the highly specialized maintenance crew for the Blue Angels Flight Demonstration Squadron, lands in Pensacola, Florida, during an annual open house and air show Nov. 11, 1989.*

Photo courtesy of NARA

*A Navy C-130 Hercules aircraft flies past Gibraltar.*

*New Zealand dog handlers from Scott Base, Ross Island, exercise their dog teams on the sea ice runway at then-Naval Air Station McMurdo Sound, Antartica, prior to long summer land expeditions. In the background are Air Development Squadron (VX) 6 C-130 Hercules, which were being used for the first year in Antarctica, Nov. 4, 1960.*

# The Dawn of C-130 Development and Operations Began in the Air Force

*By David Byrd*

Courtesy of U.S. Air Force

*The YC-130 prototype completed its first flight Aug. 23, 1954.*

The start of the Korean War brought to the forefront the Air Force's long-simmering need for improved tactical transport. On Feb. 2, 1951, the service issued a formal requirement for an aircraft capable of carrying 30,000 pounds of cargo or 90 troops, dropping its payload by parachute or using unimproved airstrips, and featuring a four-engine design with a minimum 2,000-mile range at full capacity. Although the resulting aircraft, the C-130, would never see action in the Korean conflict, it went on to become a workhorse of the Air Force, its sister services and international allies.

Lockheed Corp. quickly won the initial contract with its design and three years later, on Aug. 23, 1954, test pilots Stan Beltz and Roy Wimmer flew the company's YC-130 prototype for the first time. A resounding success, with an unprecedented eight-second takeoff roll and 30-degree climb out, by December 1956, Lockheed began delivery of operational aircraft to the Air Force. A new variant, the C-130B, with improved aerodynamics and fuel capacity, among other upgrades, began delivery in late 1958. It was the first of an alphabet soup of new C-130 models built over the ensuing decades.

The platform's versatility was reflected almost immediately in its expanded mission set. Lockheed converted several


Photo courtesy of Greg Goebel

*A replica of 56-0528, a C-130A-II "Sun Valley" reconnaissance aircraft shot down over Armenia on Sept. 2, 1958, on display at the National Cryptologic Museum, Fort Meade, Maryland.*

**"Being the 'workhorse' of the U.S. armed forces is no small task. The C-130 has supplied mission-critical manpower and materials to every American military conflict since the mid-20th century. "**

Though the Hercules was designed to carry tens of thousands of pounds, it is still one of the sky's most acrobatic fliers. Getting in and out of short, unconventional runways is in the job description for the Hercules, but this plane has also proven the ability to land on aircraft carriers, as was accomplished by Lt. James H. Flatley III when he landed on USS Forrestal (CVA 59). The C-130 can land just about anywhere at any time. While in the air, the Hercules is still a force to be reckoned with.

In 1964, a short-lived demonstration squadron, The Four Horsemen, was comprised of four C-130s. Though brief, this was not the last time the aircraft was seen as a soaring spectacle. The Hercules made its most enduring impression in 1970 when it proudly joined the U.S. Navy's demonstration squad, the Blue Angels. Affectionately nicknamed "Fat Albert," what was initially a Marine C-130T and now a C-130J, has awed audiences across the nation with its deft flying prowess alongside F/A-18E Super Hornets.

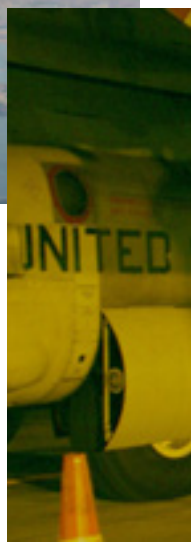
"The versatility of the KC-130J is what makes it so vital to the [U.S. Marine Corps] and a sought-after aircraft to pilot," said Capt. Luke Pederson, supporting the Tactical Airlift Program Office as Military Class Desk. "A single flight can include low-level flying, aerial refueling, aerial delivery, tactical arrivals, short field landings, or several other mission sets or tactics. Adding the ability to then be self-deployable, taking the Marines and equipment necessary to sustain deployed operations anywhere in the world at a moment's notice, truly makes the KC-130J one of the most exciting aircraft to fly. It was and will continue to be a privilege to support the Marine Air Ground Task Force and Marine Expeditionary Forces around the globe by piloting a KC-130J."

Being the "workhorse" of the U.S. armed forces is no small task. The C-130 has supplied mission-critical manpower and materials to every American military conflict since the mid-20th century. Whether cargo or manpower needs to be parachuted down or delivered while on the ground, the Hercules is up to the task.

Photo courtesy of NARA

U.S. Navy photo

*An NC-130H provides an in-flight test bed for a Radar Modernization Program under development for the next generation E-2C "Hawkeye" Carrier Airborne Early Warning aircraft, Oct. 28, 2002.*



U.S. Marine Corps photo by Lance Cpl. Andrew Skiver

*A Marine with Marine Aerial Refueler Squadron 352 pilots a KC-130J during an aerial delivery mission in support of Operation Inherent Resolve over the Middle East, Sept. 13, 2020.*

*The Navy conducts carrier suitability tests of the KC-130F Hercules aircraft aboard USS Forrestal (CVA 59).*

U.S. Navy photo by Photographer's Mate 2nd Class Carolla Bennett

*Food and equipment is unloaded from a Navy C-130 of Logistics Support Squadron (VR 64) for transport to Pakistan following a devastating earthquake October 2005.*

U.S. Navy photo by MC2 Cody Hendrix

*The Blue Angels arrive at Naval Air Station Pensacola, Florida, Aug. 17, 2020, with the team's new C-130J Super Hercules. 2020 marked the team's 50th year using the C-130 as its lead logistics aircraft.*

C-130As into reconnaissance versions of the aircraft, the C-130A-II, flown by the 7407th Combat Support Wing in Incirlik, Turkey. On Sept. 2, 1958, one such aircraft was shot down by Soviet Mig-17s over Armenia, killing all aboard, the first operational loss of a C-130. The C-130A-II was the first of several reconnaissance and surveillance iterations of the aircraft, to include the RC-130A and RC-130B, among others.

U.S. Air National Guard photo by Maj. Shay Price

*An LC-130 Hercules "Skibird" assigned to the 109th Airlift Wing, New York Air National Guard.*

The Air Force's 61st Troop Carrier Squadron flew 58 shuttle missions using ski-equipped C-130Ds to support "Operation Deep Freeze," a resupply mission to various naval stations in Antarctica, for two weeks beginning Jan. 23, 1960. Eventually, the Navy would secure its own C-130s, notably, the LC-130F for Antarctic support, the C-130G (performing submarine support) and the EC-130Q, acting as a communications aircraft under the Take Charge and Move Out (TACAMO) program. The Marine Corps (KC-130F and, later, KC-130J "Super Hercules") and Coast Guard (HC-130B/H/J and ED-130E) also employed the C-130 platform.

U.S. Air Force photo

*An EC-130J Commando Solo from the 193rd Special Operations Squadron.*

Air Force C-130s provided the backbone for U.S. humanitarian missions throughout the United States and the world, beginning in 1960 with an airlift of food and supplies to the war-torn Republic of Congo. Assistance to relieve famine, flood, earthquakes, hurricanes, and other natural and man-made disasters followed. From 1960 through the mid-1990s, the U.S. provided assistance more than 500 times, with C-130s supporting much of the airlift.

In the spring of 1962, the Air Force accepted its first C-130Es,

The heart of any mission is to protect and preserve human life. With its massive cargo capacity, the Hercules has brought in fire trucks, medical supplies and evacuation support in times of crisis. Notably, a C-130 rescued 452 refugees in a single flight from the fall of Saigon on April 29, 1975.

"During Operation Northern Watch, we were deployed as standby tanker crews with two KC-130s to a forward-operating base in Turkey [November 2000-March 2001]," said retired Master Sgt. Anthony Villa, current KC-130J production IPT systems engineer for the program office. "In the event that a pilot was shot down operating in the no-fly zone, we would provide fuel to the Air Force rescue helicopters. The aircraft we had on hand were [Bu.No.] 149815 and 160240. Aircraft 815 was accepted in 1962 and aircraft 240 was accepted in 1977. We were supporting some of the newest, most modern and sophisticated aircraft in the USAF inventory with two of the oldest, non-Night Vision Imaging System (NVIS), half-working fuel-quantity system, non-counter-measures-having KC-130s in the Marine inventory. We never missed a mission. We were 'alone and unafraid.'"

**"The heart of any mission is to protect and preserve human life. With its massive cargo capacity, the Hercules has brought in fire trucks, medical supplies and evacuation support in times of crisis. "**

Retired Staff Sgt. Charles Miller, the program office's former KC-130J IPTL, said, "During my tour at [Marine Aerial Refueler Transport Squadron] VMGR-352, I had the luxury to deliver a part of Naval Aviation history from Marine Corps Air Station Miramar, San Diego, California, to its final resting place at the Naval Aviation Museum in Pensacola, Florida. The KC-130F Bu.No.149798 S/N 282-3680 aircraft was delivered to the museum in 2006, but back in October/November of 1963, this same aircraft was a part of testing to see if a C-130 was feasible to land on aircraft carriers as a Super Carrier On-board Delivery. It conducted these carrier landings on USS Forrestal for 29 touch-and-go landings and 21 full-stop landings. Two screwdrivers, a crescent wrench and safety wire pliers for a cross-country flight from San Diego to Pensacola. No problem."

*Sean Scriber is a communications specialist for the Tactical Airlift Program Office at Naval Air Station Patuxent River, Maryland.*

U.S. Marine Corps photo by Cpl. Trever Statz

*Two F/A-18D Hornets with Marine All-Weather Fighter Attack Squadron 533 approach a KC-130J with Marine Aerial Refueler Transport Squadron 352 during a Special Purpose Marine Air-Ground Task Force—Crisis Response—Central Command aerial refueling exercise, Oct. 13, 2016.*

*A U.S. Marines Corps KC-130J Hercules lands on a refurbished runway during a touch and takeoff exercise.*

U.S. Marine Corps photo by Cpl. Gabriela Garcia-Gregorio

U.S. Marine Corps photo by Cpl. Gabriela Garcia-Gregorio

*Marine Corps Maj. John Coutoumas, a KC-130J Super Hercules aircraft pilot assigned to Marine Aerial Refueler Transport Squadron 153 (VMGR-153), left, and Capt. Kale Heckerson, a KC-130J Super Hercules aircraft pilot assigned to VMGR-152, right, conduct threat reaction maneuvering training during exercise Kodiak Mace 23, Alaska, May 25, 2023.*


U.S. Coast Guard photo by Dave Silva

*A Coast Guard Air Station Elizabeth City C-130J sits on the ramp with fuel truck. The C-130J is the latest incarnation of this enduring, multi-mission platform.*

essentially an extended-range and extended-payload variant of the "B" model. "E" models would become the mainstay for the Air Force C-130 fleet for a number of years, to include its role providing tactical airlift during the Vietnam War. In 1972, pilot Capt. William Caldwell and loadmaster Tech. Sgt. Charlie Schaub each earned an Air Force Cross in a C-130E during the battle for An Loc, landing their heavily-damaged aircraft with only one functional engine.

In late 1964, the Air Force expanded use of the C-130 with the development and initial flight of the HC-130H, designed for use by the Air Rescue Service. Eventually, 63 would be delivered to the Air Force, another three to the Coast Guard, and four were modified as JC-130H for spacecraft recovery.

Air Force Special Operations Command (AFSOC) in particular put the airframe to a dizzying array of uses. Ideally suited for urban operations and delivering low-yield munitions, the fifth-generation gunship AC-130J "Ghostrider" replaced AC-130U/W gunships ("Spooky" and "Stinger II," respectively) who in turn had replaced the Vietnam-era AC-130A/D/E/H models. Air Force Staff Sgt. John Levitow earned the Medal of Honor for his actions aboard an AC-130D in February 1969, and AC-130 gunships would play critical roles in operations Just

U.S. Air Force photo by Master Sgt. Christopher Boltz

*An AC-130J Ghostrider assigned to the 4th Special Operations Squadron.*

Cause, Desert Storm, Iraqi Freedom and Enduring Freedom, among others. EC-130J "Commando Solo" entered the AFSOC inventory to broadcast radio programs to adversary troops and citizenry alike, as well as conduct electronic attack. It replaced the EC-130E "Volant Solo," a veteran of Operation Urgent Fury in Grenada 1983. HC-130J "Combat King II" aircraft replaced another C-130, the HC-130P/Ns, as the only fixed-wing personnel recovery platform. And the command accepted its final MC-130J Commando II, designed for infiltration and exfiltration and resupply of Special Forces, in December 2024.

Little did, or could, World War II military planners know the need for tactical transport they identified would result in an aircraft that 70 years later would not only still be in business, but by 2025, have resulted in dozens of variants and still be used by more than 70 nations—with no end in sight for the versatile airframe.

*David Byrd is the former editor-in-chief of Naval Aviation News.*

# VAQ-133 Completes First Next-

*An EA-18G Growler, assigned to Electronic Attack Squadron (VAQ) 133, launches from the flight deck of aircraft carrier USS Abraham Lincoln (CVN 72).*

U.S. Navy photo by MC3 Valerie Morrison

**Electronic Attack Squadron 133 (VAQ-133), assigned to Carrier Air Wing (CVW) 9, returned Dec. 14, 2024, from the Abraham Lincoln Carrier Strike Group's (ABECSG) five-month deployment to the Middle East and Eastern Pacific to Naval Air Station Whidbey Island in time for the holidays.**

The 153 sailors, 18 aircrew and seven EA-18G Growlers of the "Wizards" of VAQ-133 departed Naval Air Station North Island, San Diego, July 13, 2024.

The Wizards' deployment marked a historic milestone, as the squadron became the first in the Navy to deploy with the ALQ-249 Next-Generation Jammer (NGJ). Throughout their rigorous training and deployment, the Wizards demonstrated the future of airborne electronic attack by developing new tactics, achieving the first NGJ arrested landing and tactically employing the system.

"This deployment showcased the cutting-edge capabilities of the NGJ and reinforced the critical role of the Growler community in modern warfare," said Cmdr. Erik Dente, commanding officer, VAQ-133. "More importantly, it demonstrated the skill, dedication and perseverance of every VAQ-133 sailor and the families, friends and loved ones who supported them at home. I could not be more proud of the sailors, aircrew and support teams who made this deployment an overwhelming success."

The Wizards began and concluded their deployment in U.S. 7th Fleet, executing key training missions in support of U.S. Indo-Pacific Command and participating in a Multi-Large Deck Exercise (MLDE) with the Italian Navy's ITS Cavour Carrier Strike Group and conducting operations in the South China Sea to promote a free and open Indo-Pacific.

The strike group was ordered to the U.S. Central Command (CENTCOM) area of responsibility to bolster U.S. military force posture in the Middle East, deter regional escalation, degrade Iranian-

# -Generation Jammer Deployment

U.S. Navy photo

*An EA-18G Growler, attached to Electronic Attack Squadron (VAQ) 133, launches from aircraft carrier USS Abraham Lincoln (CVN 72).*

backed Houthi capabilities and defend U.S. forces to promote security, stability and prosperity.

While operating in the Middle East, the Wizards played a key role in supporting CENTCOM objectives, participating in dual-carrier operations with USS Theodore Roosevelt (CVN 71), flying critical combat missions to ensure the safety of deployed U.S. forces, and aiding in strikes to degrade Houthi weapons storage capabilities.

"This deployment will go down in history," said VAQ-133 Command Master Chief Frederick Tuiel, summing up the deployment. "While it wasn't filled with port visits, it was defined by impactful combat operations—experiences our sailors will share for years to come. Bringing everyone home safely makes the accomplishment even sweeter."

The squadron earned the Commander Electronic Attack Wing Pacific (CVWP) Golden Wrench Award for maintenance excellence. Wizard maintainers sustained 100% Growler mission-readiness throughout the deployment, enabling the successful completion of all assigned missions.

"The dedication of the sailors of VAQ-133 was second to none," Dente said. "Their hard work kept our Growlers fully mission capable and ensured every mission was a success. Whether from administration, operations, safety, maintenance, intelligence or food service and support divisions, it took

*An EA-18G Growler, attached to Electronic Attack Squadron (VAQ) 133, launches from the flight deck of aircraft carrier USS Abraham Lincoln (CVN 72).*

U.S. Navy photos

## Navy Declares Initial Operational Capability for Next-Generation Jammer Mid-Band System

The Navy declared Initial Operational Capability (IOC) for the Next-Generation Jammer Mid-Band (NGJ-MB) system in December 2024, bringing a quantum leap in capability over legacy systems with drastic increases in power, target flexibility and jamming technique for Naval Aviation operations worldwide.

"Next-Generation Jammer Mid-Band improves our fleet's warfighting advantage in the electromagnetic spectrum," said then Rear Adm. John Lemmon, Program Executive Officer for Tactical Aircraft Programs. "This system provides enhanced capabilities to deny, distract and disorient adversaries' radars, protecting our naval aviators and allowing them to carry out their missions in contested airspace."

The fleet got a preview of the jammer's high-end capabilities during Abraham Lincoln Carrier Strike Group's five-month deployment in 2025. Electronic Attack Squadron (VAQ) 133 deployed with the system aboard USS Abraham Lincoln (CVN 72), marking the first time NGJ-MB was used both deployed and in combat.

IOC signals the design, testing and production of this capability meet the logistical needs of the carrier air wings and EA-18G Growler squadrons.

"What an incredible day for the U.S. Navy, our Australian partners and the airborne electronic attack (AEA) community," said Capt. David Rueter, Airborne Electronic Attack Systems program manager. "The achievement of NGJ-MB IOC is a positive reflection on the hard work, innovation and resilience from a dedicated team of government and industry professionals who have developed and fielded this critical capability to the warfighters."

The NGJ-MB system, developed by Raytheon, an RTX business, is part of a larger NGJ system that will augment and ultimately replace the legacy ALQ-99 Tactical Jamming System currently used on the EA-18G Growler. NGJ-MB uses the latest digital, software-based and electronically-scanned array technologies and provides enhanced AEA capabilities to disrupt, deny and degrade enemy air defense and ground communication systems.

"NGJ-MB will boost our fleet's ability to maintain spectrum dominance. Yielding new capabilities is critical for addressing current and future threats. The era of isolated surface-to-air missile systems, which operate within a non-agile and limited frequency range, is behind us," said Lt. Cmdr. Michael Bedwell, EA-18G naval flight officer and NGJ-MB deputy integrated product team lead.

The Airborne Electronic Attack Systems Program Office is responsible for acquiring, delivering and sustaining AEA systems, providing combatant commanders with capabilities that enable mission success.

*From the Airborne Electronic Attack Systems Program Office.*


> **“Initial Operational Capability (IOC) signals that the design, testing and production of this capability meet the logistical needs of the carrier air wings and EA-18G Growler squadrons.”**

U.S. Navy photo by MC3 Michael Singley

*An EA-18G Growler, assigned to the "Wizards" of Electronic Attack Squadron (VAQ) 133, launches from the flight deck of aircraft carrier USS Abraham Lincoln (CVN 72).*

every sailor to build and maintain the combat power required during our operations.”

In addition to operational accomplishments, the deployment included port calls to Guam in August and Kuala Lumpur in November, offering sailors a chance to recharge and experience diverse cultures while supporting U.S. partner nations.

ABECSG completed more than 11,600 flight hours comprised of 5,500 sorties and more than 4,400 fixed-wing aircraft launches and arrestments throughout its five-month deployment. The embarked next-generation, multi-platform CVW 9 enables advance mobile projection of naval air power and forward operational presence.

CVW 9 consists of nine squadrons flying the F-35C Lightning II, F/A-18E/F Super Hornet, EA-18G Growler, E-2D Hawkeye, C-2A Greyhound and MH-60R/S Seahawk. The squadrons are the “Tophatters” of Strike Fighter Squadron (VFA) 14; the “Black Aces” of VFA 41; the “Vigilantes” of VFA-151; the “Black Knights” of Marine Fighter Attack Squadron (VMFA) 314; the “Wallbangers” of Airborne Command and Control Squadron (VAW) 117; the “Wizards” of (VAQ) 133; the “Raptors” of Helicopter Maritime Strike Squadron (HSM) 71; the “Chargers” of Helicopter Sea Combat Squadron (HSC) 14; and the “Rawhides” of Fleet Logistics Support Squadron (VRC) 40.

ABECSG consists of the flagship USS Abraham Lincoln (CVN 72), embarked staffs of Carrier Strike Group (CSG) 3 and Destroyer Squadron (DESRON) 21; Carrier Air Wing (CVW) 9; integrated air and missile defense Arleigh Burke-class guided missile destroyer USS Frank E. Petersen Jr. (DDG 121); and DESRON 21’s USS Spruance (DDG 111) and USS Michael Murphy (DDG 112).

Arleigh Burke-class guided-missile destroyers USS O’Kane (DDG 77) and USS Stockdale (DDG 106) remain deployed in the 5th Fleet area of operations supporting global maritime security operations.

*Story courtesy of Carrier Strike Group 3.*

# Navy Celebrates 80 Years of Flight

*By Lindsay Wooleyhand*

**During World War II, in the early days of military aerospace test and evaluation, before formal test training regimens existed, military aviators had an average life expectancy of less than nine weeks—those who survived earned the esteemed title of test pilot.**

Since its inception in 1945, the U.S. Naval Test Pilot School (USNTPS) has been at the forefront of teaching flight test and evaluation. It cultivates an exceptional cadre of elite multi-domain aerospace test professionals, including industry and foreign partners, tasked with evaluating and fielding the most advanced aerospace technologies.

What began as a necessity in the post-World War II era evolved into a rigorous and dynamic institution that is not only vital to U.S. military aviation, but has also influenced aerospace development worldwide. During the past 80 years, USNTPS has trained more than 4,800 students from no fewer than 17 countries and operates 48 aircraft representing 14 type/model/series—more than any other squadron in the Navy. The school revolutionized Naval Aviation by setting a new standard for flight test education—one rooted in safety, innovation and cutting-edge techniques—to conduct full-spectrum test and evaluation of aircraft and airborne systems.

Prior to the creation of USNTPS, flight test and evaluation in the Navy was informal, with volunteer test pilots and flight test engineers, relying on little more than skills and bravery. Early test pilots were responsible for evaluating, modifying and delivering new aircraft, with survival alone sometimes earning them the


U.S. Navy photo

*A TA-4J Skyhawk attack aircraft sits in front of the U.S. Naval Test Pilot School (USNTPS) in Patuxent River, Maryland.*

# Test at U.S. Naval Test Pilot School

title of test pilot. The system left considerable room for improvement.

"The early days were a lot more about a pilot's willingness to test than formalized training," said Rich Harris, a curriculum liaison and retired U.S. Naval special warfare combat crewman serving USNTPS since 2007. "We joke about how someone would walk into a room full of pilots and ask, 'Who wants to try out the new airplane?' If they survived, they became a test pilot. That's not really the way it worked, but it usually did involve on-the-job-training and the need to formalize that training became increasingly more apparent."

In early 1945, Cmdr. Sydney Sherby led the committee to recommend a course of instruction for Navy flight test pilots at the Navy's Flight Test Center—what is now the Naval Air Warfare Center Aircraft Division—at Naval Air Station (NAS) Patuxent River, Maryland. In response to the growing need for well-trained test pilots, and with Sherby's help, the Navy established what was then known as Flight Test Pilots' Training Program on March 12, 1945, which would later become the U.S. Naval Test Pilot School in 1958.

Aiming to create a formalized education system that prepared aviators for the complex demands of flight test, the program's mission was clear: to properly train newly assigned pilots and enhance the expertise of those already in service. Pilots and engineers needed the knowledge and tools to test, evaluate and improve aircraft systematically. They had to return from flights not only with suggestions for

**"We joke about how someone would walk into a room full of pilots and ask, 'Who wants to try out the new airplane?' If they survived, they became a test pilot."**

U.S. Navy photo by Adam Skoczylas

*Senior instructor Dr. Vernon Gordon, right, leads an Oct. 3, 2018, class at USNTPS at Naval Air Station Patuxent River, Maryland. The 11-month curriculum includes 530 hours of academic instruction in fixed-wing, rotary-wing and airborne/unmanned systems.*


U.S. Navy photo

*The school operates two U-6A Beavers as part of the qualitative evaluation program, which exposes students to the handling characteristics of a wide variety of unique aircraft.*

*The backbone of jet training at USNTPS, the two-seat T-38 Talon is used to train students in a number of roles, including aircraft handling and flight characteristics, transonic performance and system integration. Primarily flown by the U.S. Air Force, USNTPS currently has 10 T-38Cs.*


U.S. Navy photo by Erik Hildebrandt

improvements, but also with the ability to articulate the reasoning behind those changes—they needed the what, the how and the why.

This focus on real-world application continues today, as a rapidly changing technological landscape leads to changing requirements prioritized based on cost, schedule and mission performance.

"That's where pilots and engineers come in," Harris said. "They figure it out. It all comes back to what the fleet needs, which is why USNTPS relies on fleet aviators. Fleet experience is real-world, hands-on experience, not just theoretical. It allows us to go back to the pilots and ask, 'How is this system actually working?'"

Since the institution's inception, USNTPS continually evolves. What started as a 12-week night school has transformed into a full-time, yearlong program that incorporates both theoretical and hands-on training. This shift reflects the growing complexity of aviation technologies and the increasing demand for skilled testers. USNTPS has adapted by bringing in new content, incorporating advanced simulation tools and adding field-based experiences that prepare its graduates for the pressures of modern Navy and Marine Corps aerospace test programs.

"We emphasize the mindset," said

**February 21, 1945:** Cmdr. Sydney Sherby establishes a committee to recommend a formal education program for flight test pilots and engineers in the Navy.

**March 12, 1945:** Fourteen pilots and engineers convene the first class of the U.S. Navy's new Test Pilot Training Division.

**October 3, 1953:** Cmdr. James B. Verdin (Class 8) sets a world record for speed flying an F-4D Skyray.

**1954:** Members of Classes 8 and 9 participate in the first trials of an angled aircraft carrier deck, steam catapult and the Mk-7 arresting gear—innovations that fundamentally changed the nature of carrier aviation.

**August 1957:** Royal Air Force Flying Officer Sidney Hughes conducts the first planned low-altitude ejection from a Martin-Baker Mk-5 ejection seat aboard a Grumman F9F-8T Cougar at NAS Patuxent River.

**1958:** The Test Pilot Training Division is renamed the U.S. Naval Test Pilot School (USNTPS).

**1961:** USNTPS creates a separate rotary wing curriculum.

**May 5, 1961:** Alan B. Shepard Jr. (Class 5) becomes the first American in space during his 15-minute, 302-mile suborbital flight in the Mercury spacecraft Freedom 7.

1945 1950 1960

Cmdr. Travis Hartman, commanding officer and USNTPS alumnus. "We don't just teach a process—we teach students to be master thinkers, capable of solving complex, ill-defined problems under pressure while fielding suitable solutions within time and budget constraints. Because of this, our graduates become very adaptable."

According to Hartman, a cornerstone of USNTPS's success is its approach to education. Unlike traditional academic programs, the balanced focus is also on developing master practitioners. These students, who will go on to execute high-stakes flight tests, are prepared not only to assess aircraft but also to make recommendations that impact actual missions and save lives.

**"We aren't just teaching theory. Our students will go on to be the ones executing the test plans and maneuvers. The stakes are incredibly high."**

U.S. Navy photo

*USNTPS F/A-18F Super Hornets fly over NAS Patuxent River, Maryland.*

*USNTPS flies five UH-60L helicopters, four of which have a variable stability system (VSS) that effectively turns the helicopter into a flying simulator, allowing instructors to change the aircraft's flight characteristics in real time; students can then experience flight behavior they previously only learned in the classroom.*

U.S. Navy photo by Erik Hildebrandt

**Oct. 11, 1968:** Wally Schirra (Class 8) and two crewmates make the first crewed flight of the Apollo moon-landing program. Apollo 7 goes on to make 163 orbits around Earth over 260 hours and 9 minutes of flight.

**October 1970:** Class 58 welcomes foreign partner pilots from Italy, Japan and Australia.

**June 1975:** USNTPS moves to Hangar 110, adjacent to the Naval Air Test Center's rotary-wing hangar. The move consolidates the school's flying and academic work for the first time.

**June 1983:** Lt. Colleen Nevius (Class 83) becomes the first female naval aviator to graduate from USNTPS.

**Dec. 10, 1982:** Gina Moy (Class 82) becomes the first female civilian aeronautical engineer to graduate from USNTPS.

1970 1980

U.S. Navy photo by Erik Hildebrandt

*The T-6B Texan II, built by Textron Corporation, is a tandem-seat, turboprop trainer whose mission is to train Navy and Marine Corps pilots and flight officers. USNTPS has been flying the Texan II since 2010.*

U.S. Navy photo by Erik Hildebrandt

*USNTPS uses the Vietnam-era OH-58C Kiowa for rotary-wing training. USNTPS is the only U.S. military institution with a formal rotary-wing curriculum and the only test pilot school in the world with a dedicated airborne systems curriculum.*

"Being a part of USNTPS means that the instructors, as well as the students, have skin in the game," Hartman said. "We aren't just teaching theory. Our students will go on to be the ones executing the test plans and maneuvers. The stakes are incredibly high."

This commitment to real-world application is at the heart of what sets USNTPS apart.

This hands-on approach is further enriched by the school's varied international presence, which adds a global dimension to its training. With students from 17 allied nations, each brings unique experiences that contribute to the breadth and depth of the program. In partnership with the three other major test pilot schools, the Navy and Marine Corps select officers to attend and instruct at the Empire Test Pilots' School in Boscombe Down, United Kingdom; the École du Personnel Navigant d'Essais et de Réception (EPNER) in Istres, France; and the U.S. Air Force Test Pilot School at Edwards Air Force Base, California. This exchange of knowledge, coupled with the varied backgrounds of the students and instructors, adds an invaluable holistic perspective to the schools.

Additionally, USNTPS partners with the U.S. Army, serving as its test

**January 28, 1986:** Michael Smith (Class 66) perishes along with six crewmates aboard the space shuttle Challenger after its explosion shortly after launch.

**June 1994:** Twins Mark and Scott Kelly (Class 105) graduate from USNTPS. The "NASA Twins" are the first and only set to travel to space to date. The brothers served as subjects for research on the effects of space travel on the human body when Scott spent an additional year in orbit while Mark remained on earth as a control subject.

**1996:** The first "flying classroom," a modified P-3C Orion, dubbed the Airborne Systems Testing and Research Support (ASTARS) aircraft, goes into service at USNTPS, enhancing airborne systems training for test pilots under instruction.

**February 2003:** The Outstanding Student Award is renamed in honor of Cmdr. Willie McCool (Class 101) following his death. McCool perished alongside his six crewmates when the space shuttle Columbia disintegrated reentering Earth's atmosphere from orbit.

**Jan. 13, 2005:** Col. Steve Kihara becomes USNTPS' first commanding officer from the U.S. Army.

1990 2000

pilot school, which also strengthens the school's training environment. The Army sends 10 to 11 pilots and engineers annually to attend USNTPS, providing instructors, aircraft and a rotation of leadership, including the roles of executive officer and commanding officer. This inter-service collaboration contributes to the program's well-rounded training and prepares students to work across multiple branches of the military.

This collaboration is just one example of how USNTPS's influence extends beyond its immediate schoolhouse. The school's impact on flight test education in Naval Aviation is far reaching and enduring. USNTPS graduates, including nearly 100 who have become astronauts, have played a crucial role in the development and deployment of major technologies. The test pilots, engineers and leaders trained at the school continue to shape the future of military aviation, tackling complex problems and pushing the boundaries of technology. From aircraft to weapons systems, to sensors and links, the minds trained at USNTPS have shaped the very technologies that keep the U.S. military at the forefront of global defense.

"Our graduates have been integral to the success of every major Navy and Marine Corps aerospace technology since


U.S. Navy photo

*An F/A-18 Hornet sits on the flightline at NAS Putuxent, Maryland.*

U.S. Navy photo by Erik Hildebrandt

*Designed as a multi-mission aircraft to provide high-priority transportation of personnel and cargo, USNTPS uses the twin-engine C-12 Huron "King Air" to train students in flying qualities, flight test techniques and modern avionics systems testing.*

**May 2014:** First student final project is conducted on a UAS using an MQ-9C Reaper autonomous unmanned aircraft.

**November 3, 2014:** Cmdr. Tony Wilson (Class 132) makes the first arrested carrier landing flying the F-35C aboard USS Nimitz (CVN-68).

**January 2019:** Class 156 becomes the first to receive training in unmanned airborne systems as part of its regular syllabus.


2010 2020 2025


*A C-26A Metroliner ASTARS III sits on the ramp at Patuxent River, Maryland. USNTPS uses the aircraft to train students in the airborne systems flight test.*

U.S. Navy photo


U.S. Navy photo

*J.J. McCue, NAVAIR Esteemed Fellow, discusses aerodynamics principles and flight test techniques with USNTPS Class 133.*


U.S. Navy photo by Lindsay Wooleyhand

## Navy Test Pilots Take Center Stage in

A new exhibit showcasing developmental test pilots, flight officers, engineers and the history and influence of the U.S. Naval Test Pilot School (USNTPS) launched in April 2025 at the Patuxent River Naval Air Museum.

The exhibit, "80 Years of the U.S. Naval Test Pilot School: Honoring the Past, Inspiring the Future," brings Southern Maryland—home of developmental flight test for the Navy and Marine Corps—an up-close look at the profession of flight test and the training institution where it all starts.

"USNTPS transformed flight test education and inspired generations of leaders who push the boundaries developing Navy and Marine Corps aerospace technology," said USNTPS Commanding Officer Cmdr. Travis Hartman. "This exhibit is a tribute to that legacy and looks forward to the future of aviation innovation. We are excited to share this with visitors and, hopefully, future testers."

**"The U.S. Naval Test Pilot School's legacy is one of excellence, innovation and adaptability—values that continue to guide the school as it celebrates its 80th anniversary and looks toward the future."**


U.S. Navy photo

*Primarily used by the U.S. Army, the Airbus light-utility helicopter UH-72A Lakota also serves to train USNTPS students in rotary-wing performance and flying qualities. It has served in that capacity since 2009.*

the end of World War II," Hartman said. "They've played a role in developing and fielding the systems that have kept this nation safe. That legacy continues to this day."

The U.S. Naval Test Pilot School's legacy is one of excellence, innovation and adaptability—values that continue to guide the school as it celebrates its 80th anniversary and looks toward the future. Whether training the next generation of test pilots or collaborating with global partners, USNTPS remains a critical force in advancing military aviation technology and preparing aviators and engineers to push the boundaries of what is possible, while serving as a testament to the importance of structured, yet dynamic, flight test education.

As Hartman puts it, "As an institution, we're always changing because our field of expertise is always changing as technology advances. We're never static. Our history of dynamism has kept this institution relevant for 80 years, with the minds we've trained going on to develop the technologies that have kept this country safe. Our mission remains the same: to continue teaching the minds that will shape the future of aviation."

*Lindsay Wooleyhand is a strategic communications specialist with the U.S. Naval Test Pilot School.*

## New Exhibit at Patuxent River Naval Air Museum

Through a series of engaging displays, visitors can learn about the critical and sometimes dangerous role developmental test pilots, flight officers and test engineers play in early aircraft and subsystem development. The exhibit highlights key milestones of USNTPS' historical development and provides insight into test pilot student life, including its demanding curriculum that shapes the aviation industry's cadre of flight test professionals. Designed to inform and inspire future talent, the exhibit aims to spark curiosity and ambition in aspiring test pilots and future aerospace professionals.

USNTPS is an institution recognized worldwide for its rigorous academic program and excellence in developmental flight test training, serving test pilots across all military services and many international partners. The Navy's test pilot school also serves as a dedicated test training institution for the U.S. Army and has graduated nearly 100 NASA astronauts to date, including John Glenn, Alan Shepard and Wally Schirra.

The exhibit was developed in partnership with the Naval Air Warfare Center Aircraft Division (NAWCAD), parent command to USNTPS. The school is a first stop for most of NAWCAD's developmental test pilots and flight officers before they begin assignments testing aircraft at one of six developmental test squadrons.

The exhibit is open through 2026.

NAWCAD operates test ranges, laboratories and aircraft in support of test, evaluation, research, development and sustainment of everything flown by the Navy and Marine Corps. Based in Patuxent River, Maryland, the command also has major sites in St. Inigoes, Maryland; Lakehurst, New Jersey; and Orlando, Florida.

*From Naval Air Warfare Center Aircraft Division Public Affairs.*

# NRL PROTECTS

# NAVAL ASSETS: Land, Sea and Air

*By Emily Winget*

**The relentless assault of salt-laden sea spray generated by coastal wave action poses a significant and persistent threat to the integrity of Department of War assets near and far from shorelines. This corrosive environment accelerates the deterioration of critical military and naval resources, challenging their lifespan.**

U.S. Navy photo illustration by fred Flerlage; photo imagery by PO3 Jason Johnston

"Ensuring the readiness of our naval assets is paramount to the Navy's mission, and understanding the insidious threat of corrosion, even far from the waterline, is a critical component of that readiness," said Capt. Jesse Black, U.S. Naval Research Laboratory's (NRL) commanding officer. "By advancing our understanding of corrosion, we can develop innovative solutions to protect our ships and equipment, ultimately saving valuable time for our sailors and safeguarding our vital assets."

Alex Johnson is a National Research Council postdoctoral fellow with NRL's Chemistry Division Center for Corrosion Science and Engineering. He studies the impact of corrosion from saltwater aerosols on naval assets to better understand how breaking waves produce a mist that can cause costly damage.

"This research is crucial for understanding the potential for corrosion on naval ships, aircraft and equipment, even those located at a distance from the water," Johnson said. "By quantifying the distribution and deposition of salt aerosols, we can better assess the corrosion risk associated with different locations and environments."

Johnson is conducting research at the NRL Laboratory for Autonomous Systems Research Littoral Bay Wave Pool to simulate ocean conditions and learn how saltwater aerosols are generated and transported by waves, bubble bursting and interactions between the land-sea interface.

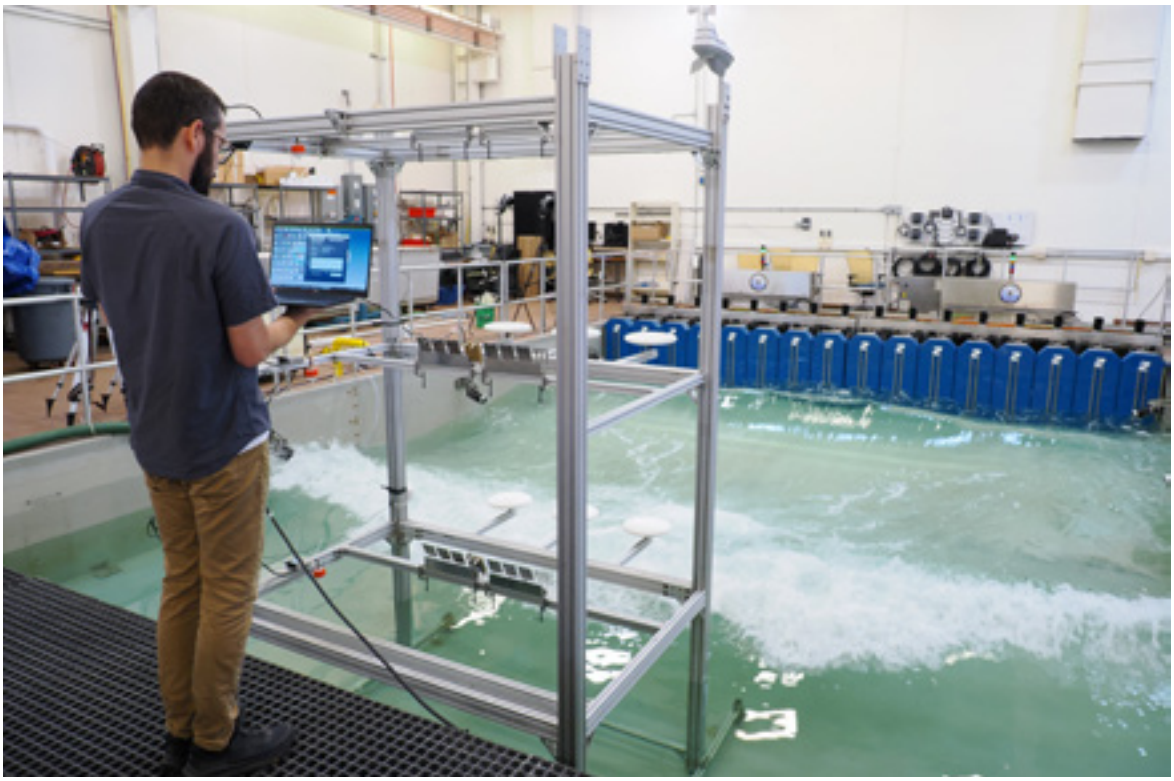
Johnson strategically placed 3D-printed, specially designed airfoils above the wave pool, subjecting them to typical environmental conditions found along a shoreline. He aims to determine how far and how much salt spray can travel to learn how the spray can impact naval assets located away from the immediate shoreline.

"We have observed that there is a zone of enhanced corrosion proximate to the shoreline. The corrosivity is worse right at the surf zone and then rapidly decreases over hundreds of meters," said Raymond Santucci, materials engineer in NRL's Corrosion Science Section. "Over longer distances, the corrosivity is lesser and decreases more gradually but has an impact much further inland. Whether we are conducting field testing, or DoW is deploying assets at installations, the exact distance matters when you are close to the coast."

Distance matters to both surface and subsurface vessels, as well as to naval aircraft that are exposed to sea salt aerosols during flight within the marine boundary layer—the lowest part of the atmosphere directly impacted by the ocean—and while stationed on flight decks or at land-based installations.

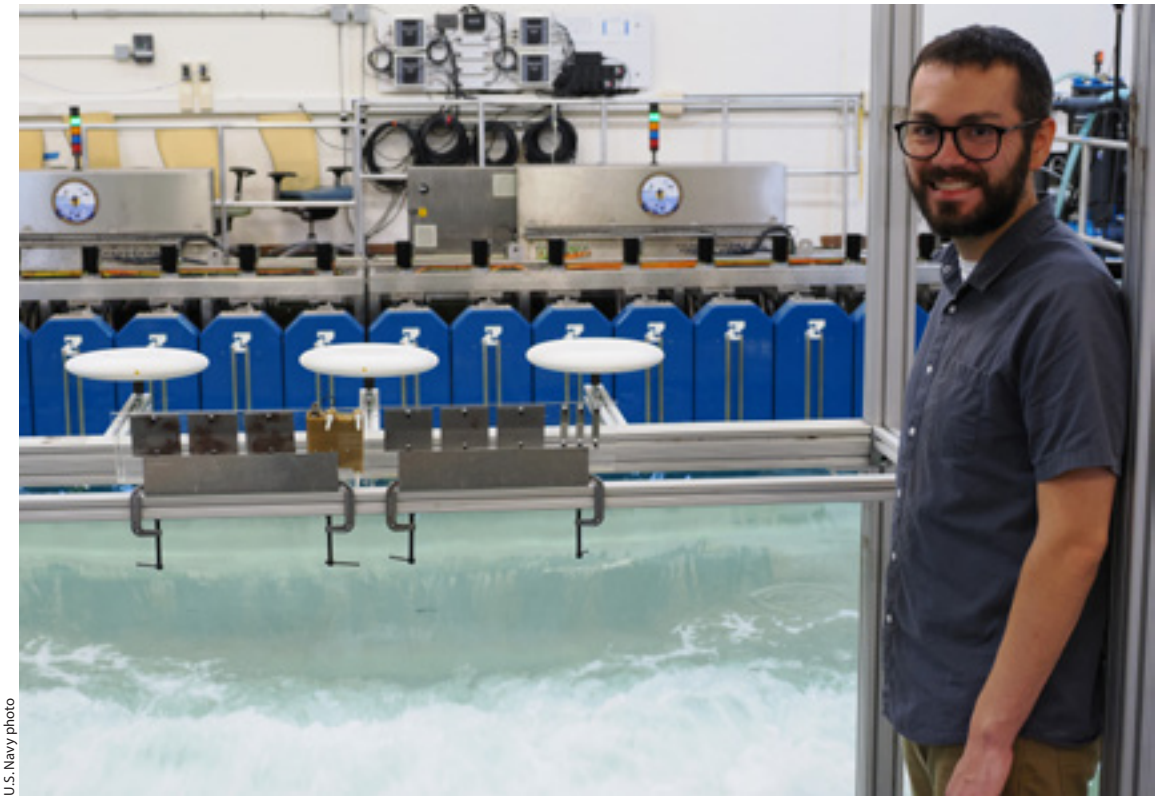
"The design and sustainment of DoW assets is improved if the corrosion risk of the operating environment is better characterized," Santucci said.

Currently, maintenance protocols (i.e., rinsing, washing, covering, inspection and repairs) are determined by factors such as the severity of the deployment location, the flight altitude above sea water and proximity to the ocean. The existing protocols do not consider corrosion caused by traveling sea salt aerosols. Time, manpower, materials and money can be better allocated if preventative and corrective maintenance is calibrated correctly for



U.S. Navy photo

*Alex Johnson, U.S. Naval Research Laboratory (NRL)-National Research Council (NRC) postdoctoral fellow with NRL's Chemistry Division, Center for Corrosion Science and Engineering, studies the impact of corrosion from saltwater aerosols at the NRL Laboratory for Autonomous Systems Research (LASR) Littoral Bay Wave Pool, in Washington, D.C., Sept. 24, 2024.*



U.S. Navy photo

*Alex Johnson stands next to symmetric airfoils used to measure the dry deposition of chloride and sulfate. The airfoils are used to study the impact of corrosion from saltwater aerosols at the NRL Laboratory for Autonomous Systems Research (LASR) Littoral Bay Wave Pool in Washington, D.C.*

**"The goal of the experiment is to characterize dry deposition, airborne concentration and particle mass size ranges of sea spray aerosol with height in a controlled setting that mimics the land-sea interface."**

the severity of the location. This is where Johnson's research comes in.

"The results of this research will lead to better corrosion modeling and the ability to tailor corrosion maintenance based on specific service conditions, thereby optimizing resource usage," Santucci said.

In Johnson's experiment, the Littoral Bay was equipped with wave actuators for controlled wave crashing to generate sea spray. The pool was filled with "instant ocean" to simulate ocean water, and a scaffolding structure was used to mount equipment for a five-day exposure.

"The goal of the experiment is to characterize dry deposition, airborne concentration and particle mass size ranges of sea spray aerosol with height in a controlled setting that mimics the land-sea interface," Johnson said.

To further enhance the realism of the study, Johnson plans to introduce a slope to the wave pool to create an artificial shoreline. Testing with the sloped configuration is scheduled to commence in summer 2026.

"Our corrosion data varies wildly for locations close to a shoreline. We hypothesize that this is due to differences in the local bathymetry, or character, of the beach," Santucci said. "The exact same wave approaching different types of coasts will result in different breaking waves, which results in different sea spray aerosol production. To adequately capture this effect in a controlled research setting, an artificial shoreline is needed to explore the pertinent variables."

Even without the artificial shoreline, the team has validated the method to generate and assess sea spray aerosols from breaking waves.

"We also investigated the height at which the aerosols traveled and analyzed corrosion along an approximately 3-meter-high tower. We found that most of the large, salt-rich aerosols did not travel as high as the smaller aerosols," Johnson said. "This, in turn, correlated to the higher corrosion rate of metals closer to the water surface than those higher up the tower. For future work, we also want to investigate the horizontal distance these aerosols will travel, which can also help us assess the corrosion risk of infrastructure and assets near the coastline."

This research has the potential to impact naval operations significantly by providing valuable data on the long-term effects of saltwater aerosols on naval assets in all coastal environments: land, sea and air.

*Emily Winget is a public affairs specialist with the U.S. Naval Research Laboratory.*

# SUPER HORNET AT 30

## *Sustaining a Legend, Shaping the Future*

*By Sarah Ehman*

**As the F/A-18 Super Hornet celebrates 30 years of distinguished service, its legacy continues to evolve with the F-35 Lightning II, the MQ-25 Stingray and E-2D Hawkeye flying alongside it. Operating in unison, these platforms strengthen the Navy's ability to project power, ensure maritime security and dominate any battlespace.**

*Lt. Clint Vance signals an F/A-18F Super Hornet assigned to the "Bounty Hunters" of Strike Fighter Squadron (VFA) 2 to launch from the flight deck of the Nimitz-class aircraft carrier USS Carl Vinson (CVN 70) in the South China Sea, Jan. 12.*

U.S. Navy photo by MC3 Nate Jordan

The air was cold and clear over the tarmac at Lambert Field in Missouri on Nov. 29, 1995. The temperature hovered just above freezing, and a light southeast wind swept across the runway, where a sleek new fighter jet rumbled, ready for takeoff.

At 11:15 a.m., McDonnell Douglas test pilot Fred Madenwald advanced the throttles and the first F/A-18E Super Hornet, known as E-1, took to the sky. Its engines cut through the crisp Missouri air, marking the beginning of what would become a decades-long story of innovation, service and adaptability.

The Super Hornet has since become known as the backbone of American carrier aviation. It has flown into combat, supported humanitarian missions, deterred threats and projected U.S. power around the world.

In the coming years, the F-35C and the Navy's next-generation strike fighter will together provide the carrier air wing's tactical aviation capacity, with the new aircraft gradually augmenting and ultimately replacing the F/A-18E/F Super Hornet and EA-18G Growler. This multi-aircraft synergy highlights the

U.S. Space Force photo by Dalton Prejeant

*The Strike Fighter Squadron (VFA) 122's West Rhino Demo Team performs a precision aerial maneuver during the Great Colorado Air Show at Northern Colorado Regional Airport, Sept. 20.*

# SUPER HORNET: DECADES OF LEGACY

## '90s

### First Flight

***November 29, 1995,*** at St. Louis International Airport

Photo courtesy of Boeing

### Early Concepts and Planning

## '00s

### Initial Sea Trials

John C. Stennis (CVN 74)
Completed in 5 days

- ✔ 64 landings and launches
- ✔ 54 touch-and-gos

Photo courtesy of Boeing

U.S. Navy photo by MCSN Chris Williamson

*F/A-18F Super Hornets, assigned to the "Black Knights" of Strike Fighter Squadron (VFA) 154, line the flight deck of the Nimitz-class aircraft carrier USS Theodore Roosevelt (CVN 71), Jan. 25, 2024.*

U.S. Air Force Photo by Staff Sgt. John C.B. Ennis

*A pair of U.S. Navy F/A-18E Super Hornets assigned to the Nimitz Carrier Strike Group conduct a combat air patrol over the U.S. Central Command area of responsibility, Aug. 7.*

## Initial Combat Action

***November 2002*** during Operation Southern Watch

## Block II

- Active Electronically Scanned Array (AESA) radar
- Improved sensors & avionics
- Increased range
- Precision weapons capability

## First Cruise

***July 2002*** with VFA-115 aboard USS Abrahm Lincoln (CV 72)

## Predominant Fleet Aircraft

The F/A-18 Super Hornet became the predominant aircraft in the U.S. Navy carrier fleet in 2006

U.S. Navy timeline graphic by Paige Marino; photo imagery by U.S. Navy

strength of Naval Aviation and the collective capability of a unified air wing.

"We remain the strongest and most formidable force in the world, and each asset of the carrier air wing, like the Super Hornet, brings unique capabilities to ensure we stay lethal, adaptable and ready for the fight," said Rear Adm. Joseph Hornbuckle, program executive officer for Tactical Aircraft Programs (PEO(T)). "Naval Aviation is always prepared and ready to support our warfighters wherever they are to defend our homeland, our partners and allies, and our way of life."

"I had the privilege of flying the Super Hornet into combat after 9/11 in the skies over Afghanistan and then again in the skies over Iraq and Syria," said Capt. Michael Burks, who has served as the F/A-18 and EA-18G Program Office program manager since 2023. "With at least two more decades of flying for the Super Hornet, we continue to modernize and upgrade this airplane to keep it as lethal and survivable as possible as the

U.S. Navy photo by PO2 Class Ryan Kledzik

*Pilots conduct preflight checks on an F/A-18F Super Hornet assigned to the Fighting Swordsmen of Strike Fighter Squadron (VFA) 32 on the flight deck of the aircraft carrier USS Dwight D. Eisenhower (CVN 69) "Ike," Dec. 11, 2016.*

## International Partnerships

***March 2007*** Australia purchase decision

***March 2010*** First delivery to Australia

***February 2018*** Kuwait purchase decision

## Air-to-Ground Attack & Air-to-Air Combat

***June 2017*** USN F/A-18E downs a Syrian Air Force Sukhoi Su-22 "Fitter" fighter-bomber, the first by an American fighter since 1999

**'10s**

## Maximized Air Power

Key role in campaigns such as:

- ✔ Operation Enduring Freedom
- ✔ Operation Iraqi Freedom
- ✔ Operation Inherent Resolve

U.S. Navy photo by MC2 Matthew Nass

*Naval aviators signal an F/A-18E Super Hornet from the "Knighthawks" of Strike Fighter Squadron (VFA) 136 from the landing signal platform on the flight deck of the Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75) in the Atlantic Ocean, Aug. 1, 2024.*

tactical environment evolves. That is one of the reasons it's been so successful from E-1 to now."

## New Design, New Capabilities

The Super Hornet was born out of a need to replace the aging F-14 Tomcat aircraft and the A-6 Intruder. Rather than starting from scratch, designers evolved the F/A-18 into a larger, more powerful and longer-range variant—one that could carry the Navy into the 21st century. The Super Hornet was the near-term, generational leap of the original Hornet.

The Super Hornet was designed for versatility from the outset and boasts 25% more wing area, 33% more internal fuel and increased payload capacity than its predecessor. The Super Hornet was built to go farther, fight harder and stay airborne longer. Twin engines gave it the power to launch from carrier decks in all conditions, advanced avionics and survivability features made it capable across a wide range of missions, and its design allowed for quick adaptation to new technologies.

Like many long-running defense programs, the Super Hornet faced tough scrutiny early on. Some questioned the decision to modify an existing de-

### Block III

- Reduced radar signature
- New avionics suite that brings enhanced situational awareness into the cockpit
- Advanced cockpit system
- Distributed Targeting Processor Network and Tactical Targeting Network Technology

### Service Life Modification

- Increased service life of 10,000 flight hours
- Reduced burden on maintainers, supply system and depot-level assets

## '20s & Beyond

### Predominant Aircraft into 2030s

New capabilities and advancements to stay ready, reliable and relevant

U.S. Navy timeline graphic by Paige Marino; photo imagery by U.S. Navy

sign rather than invest in a new platform. Others worried the aircraft would not deliver the speed, stealth or survivability needed for high-threat environments and questioned the jet's ability to remain relevant long term.

In the wake of Cold War drawdowns and evolving global threats, that tension helped push the program toward rapid, iterative improvements, absorbing lessons from the fleet and responding with advances in sensors, systems and survivability, like active electronically scanned array radar, advanced targeting pods and other enhancements that have kept the platform in step with evolving operational threats.

Photo courtesy of Boeing

*The U.S. Navy awarded The Boeing Company a $1.3 billion contract March 19, 2024, for the purchase of Block III F/A-18 Super Hornets and delivery of a technical data package vital to the sustainment of the platform.*

## The Future Flies with the Super Hornet

Even at 30, the Super Hornet continues to level up. The newest version—the Block III Super Hornet—looks like the same jet, but inside, it's smarter, tougher and built for future flight.

The Block III brings a host of upgrades to help pilots stay ahead in fast-changing battlespaces:

- An advanced cockpit system gives pilots faster access to mission data
- Features that improve survivability in high-threat environments
- A powerful new computer processor and data-sharing network allow it to connect seamlessly with other aircraft, ships and command centers
- The airframe itself has been reinforced to fly up to 10,000 hours, extending its service life into the 2040s

The Navy's future air wings will include fourth-, fifth- and sixth-generation strike fighters, unmanned aircraft and advanced electronic warfare platforms. This multi-aircraft synergy highlights the strength of Naval Aviation—not just in individual airframes, but the collective capability of a unified air wing: a lethal, flexible and resilient air wing. The Block III Super Hornet remains a core component of that force, and its adaptability ensures it will keep pace with changing threats and technologies, even as new platforms come online.

"That adaptability became the aircraft's greatest strength," Burks said. "What you see today is the result of hard-earned trust—earned on the flight deck, in the field and over decades of operational use."

## Versatility in Service

As program manager, Burks oversees the efforts of active-duty military, Navy civilian service and contractor personnel within the F/A-18 and EA-18G program office who are working to support, sustain and advance the Super Hornet and its close cousins, the legacy Hornet and the EA-18G Growler. Add to that the fleet aviators, maintainers, industry production line workers and so on—one can quickly understand that while the Super Hornet's longevity is a technical triumph, it's also a human one. Its legacy represents thousands of careers—pilots, maintainers, engineers, deck crews, logisticians, software developers, test teams and project managers—people who, together, have built a lasting platform through deliberate, disciplined effort.

"People from all walks of life and areas of Naval Aviation feel some tangible connection to this aircraft," Burks said. "Whether they've worked on the production line, whether they were engineers that did design work, whether they wore the uniform or are wearing it right now. The history of this aircraft—which is still being written—represents and honors the enduring impact of those who started and those who are sustaining what is probably one of the greatest runs in Naval Aviation for any platform out there."

After entering fleet service in 1999, the aircraft flew its first strike mission in 2002 in support of Operation Southern Watch in Iraq, soon becoming a central player in post-9/11 military operations. During operations Iraqi Freedom and Enduring Freedom, aviators flew Super Hornets in strike missions over Iraq and Afghanistan, provided close air support for troops on the ground and helped establish air superiority in contested skies.

U.S. Air Force photo by Staff Sgt. Tiffany A. Emery

*A U.S. Navy F/A-18 Super Hornet flies near a U.S. Air Force KC-135 Stratotanker at MacDill Air Force Base, Florida, after being refueled near Joint Base Pearl Harbor-Hickam, July 18, 2024.*

U.S. Marine Corps photo by Sgt. Victoria Decker

*U.S. Marine Corps Capt. Landon Keller, an F/A-18 Super Hornet pilot with Marine Fighter Attack Training Squadron 101, Marine Aircraft Group 11, 3rd Marine Aircraft Wing (MAW), prepares his aircraft Jan. 15, 2020.*

U.S. Navy photo by MC2 Maxwell Orlosky

*An F/A-18E Super Hornet attached to the "Rampagers" of Strike Fighter Squadron (VFA) 83 approaches the flight deck of the world's largest aircraft carrier, USS Gerald R. Ford (CVN 78), Sept. 9, 2024.*

During a dedication ceremony in 2024 when Super Hornet E-1 was inducted as an exhibit at the National Transportation Museum in St. Louis, Missouri, retired Vice Adm. Frank Morley said, "At no other time in Naval Aviation history have we had one aircraft that was the versatile airplane that did everything."

Before he retired as the principal military deputy for the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RDA)), Morley's career included service as an F/A-18 E/F test pilot with Air Test and Evaluation Squadron (VX) 23, where he was the fifth pilot to fly the Super Hornet and the first to land aboard a ship. He later served as program manager for the F/A-18 and EA-18G Program Office.

"This airplane was built purposely for more capacity, power, weight, cooling and bring back," Morley said. "That has shown itself well because we continually upgrade the software, we continually

U.S. Navy photo by MCSN Daniel Kimmelman

*An F/A-18E Super Hornet, attached to Strike Fighter Squadron (VFA) 151, launches from the flight deck of the Nimitz-class aircraft carrier USS Abraham Lincoln (CVN 72), Aug. 23.*

Marine Corps photo by Cpl. Jerry Edlin

*The U.S. Navy Blue Angels perform a stunt as part of the 2022 Kaneohe Bay Air Show, Marine Corps Base Hawaii, Aug. 13, 2022.*

update the weapons, and we continually update the avionics to keep this airplane extremely relevant."

Super Hornets, alongside every platform of deployed air wings aboard Navy carriers, play a vital role in safeguarding maritime security in the Red Sea. Through relentless combat air patrols and precision strike missions, they protect both commercial and military vessels against threats, ensuring freedom of navigation in this critical region.

## Forging Ahead

Now entering its Block III era, the Super Hornet features advanced cockpit systems, stealth coatings, improved connectivity and extended airframe life. The latest production aircraft will arrive right off the line with Block III features while Service Life Modification efforts provide Block II aircraft with Block III capability and increase their service life from 6,000 to 10,000 hours. These enhancements are designed to keep the Super Hornet lethal and survivable in highly contested environments while seamlessly integrating with the Navy's next-generation platforms.

In 2024, the Navy placed a final order for 17 Block III Super Hornets, extending Boeing's production line in St. Louis through early 2027. While this marks the conclusion of new-build Super Hornets for the U.S., it does not signal the end of the platform's legacy. With more than

600 Super Hornets in service and the 100th Block III jet recently delivered, the aircraft will continue to provide significant combat capability into the 2040s.

"We have at least two more decades of flying for the Super Hornet; it's still the workhorse," Burks said. "The planes coming off the production line are going straight to the fight. This effort is vital to making sure that our flight lines are filled, our pilots can continue to be trained and proficient and ready, and that we have the most lethal airplanes possible going into the forward theater."

For more than 20 years, Super Hornets have launched from U.S. carriers around the world. Whether in the Western Pacific, Arabian Gulf or Mediterranean Sea, they've provided forward presence, power projection and global reassurance. Thirty years after its first flight, the Super Hornet remains one of many Naval Aviation platforms that makes Naval Aviation exceptional with persistence, adaptability and purpose. In the 2030s, the Navy's sixth-generation strike fighter will add to that excellence, augmenting and ultimately replacing the Super Hornet and EA-18G.

The Super Hornet has faced its share of challenges—but it has also delivered repeatedly. It has responded to crises, supported allies, flown deterrence missions and brought help to those in need, and, in doing so, carried forward the Navy legacy. That legacy reached a major milestone in 2025, when the F/A-18 and EA-18G program surpassed 12 million cumulative flight hours, a staggering number that few military aircraft families in history have reached.

It's a legacy that fits squarely within the broader story of America's sea services. As the U.S. Navy and Marine Corps celebrate 250 years of history this year, the Super Hornet and each platform of the carrier air wing stand as testaments to modern innovation and aviation excellence—forging the future on a foundation of service.

*Sarah Ehman is a communications specialist with the F/A-18 and EA-18 Program Office.*

U.S Navy Photo

*A formation of Air Test and Evaluation Squadron (VX) 31 "Dust Devils" aircraft, including an EA-18G Growler, an AV-8B Harrier II+, an F/A-18E Super Hornet and an F/A-18D Hornet, flies over Point Mugu's Sea Range in California during a photo exercise.*

## F/A-18, EA-18G Surpass 12 Million Flight Hours

The Navy's F/A-18 Hornet and EA-18G Growler aircraft fleet has surpassed 12 million flight hours, marking an important milestone for one of the most enduring families of aircraft in modern Naval Aviation. This achievement underscores the capability, reliability and availability of these aircraft, which have served as the backbone of the Navy and Marine Corps air power for decades.

Put into perspective, the aircraft have completed the equivalent of 500,000 days, or nearly 1,370 years, of nonstop flight defending national interests and ensuring global security.

"When you call the roar of these aircraft 'the sound of freedom,' it holds real weight," said Capt. Michael Burks, program manager for the F/A-18 and EA-18G Program Office. "Throughout their service, the F/A-18 and EA-18G family has supported nearly every major U.S. military conflict of the past 40 years and continues to adapt to rapidly changing threat environments. From the initial deployment of the Hornet to the advanced capabilities of the Super Hornet and Growler, these aircraft have delivered forward presence, tactical airpower and critical electronic warfare capabilities around the globe."

Since the F/A-18 Hornet was first introduced in the 1980s, it has quickly become a versatile and capable fighter and attack aircraft. Its successor, the F/A-18E/F Super Hornet, and its electronic warfare counterpart, the EA-18G Growler, introduced significant advancements in radar, avionics, payload capacity and electronic attack.

Key modernization efforts include Super Hornet Service Life Modification, which extends Super Hornet service life from 6,000 to 10,000 flight hours, and the delivery of Block III Super Hornets, which are equipped with advanced sensors, enhanced survivability and a redesigned cockpit for improved pilot performance. Growler Block II modifications will enhance mission systems, enable future capability growth and strengthen the Navy's electronic warfare superiority.

"This milestone is a significant achievement and a reflection of the generations of sailors, Marines and civilians who sustain, fly and innovate these platforms every day," Burks said. "Twelve million flight hours demonstrates our commitment to delivering world-class capability, enabling our warfighters to execute their missions with an asymmetric advantage and return home safely."

The flight hour milestone comes at a notable time for Naval Aviation, coinciding with the 30th anniversary of the Super Hornet's first flight in November, and as the Navy and Marine Corps celebrate 250 years of service.

*From the F/A-18 and EA-18G Program Office.*

# TITANS OF

# Sailors Gather to Celebrate

*By Commander, U.S. 2nd Fleet*

**Thousands of sailors gathered Oct. 5 at Naval Station Norfolk, Virginia, as part of America's Navy's 250th "Titans of the Sea" all-hands call celebration. Surrounded by the Nimitz-class nuclear-powered aircraft carrier USS Harry S. Truman (CVN 75) and the Wasp-class amphibious assault ship USS Kearsarge (LHD 3) on Pier 14, sailors, veterans and their families joined together for a historic salute to the world's most powerful Navy.**

*U.S. Navy sailors applaud a submarine demonstration during a "Titans of the Sea" Presidential Review, Oct. 5.*

U.S. Navy photo by MC2 Justin Kemble

# E THE SEA

# 250 Years At Sea, Ashore

*Six Arleigh Burke-class guided-missile destroyers prepare for a live fire shoot during the "Titans of the Sea" Presidential Review aboard aircraft carrier USS George H.W. Bush (CVN 77) Oct. 5.*

U.S. Navy photo by MCSN Kaitlyn Bailey

*President Donald J. Trump addresses nearly 15,000 sailors from Norfolk-based commands and guests during an all-hands call at Pier 14, alongside the Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75), Oct. 5.*

U.S. Navy photo by MC2 Justin Kemble

The guest of honor and keynote speaker was President Donald J. Trump. Also in attendance were First Lady Melania Trump, Secretary of War Pete Hegseth, Secretary of the Navy John C. Phelan and Chief of Naval Operations Adm. Daryl Caudle.

"It is a true honor to be here with thousands of our nation's finest sailors at the largest naval facility in the entire world. We gather on this historic waterfront to celebrate 250 years of strength, tenacity and unwavering courage by the greatest fighting force," Trump said.

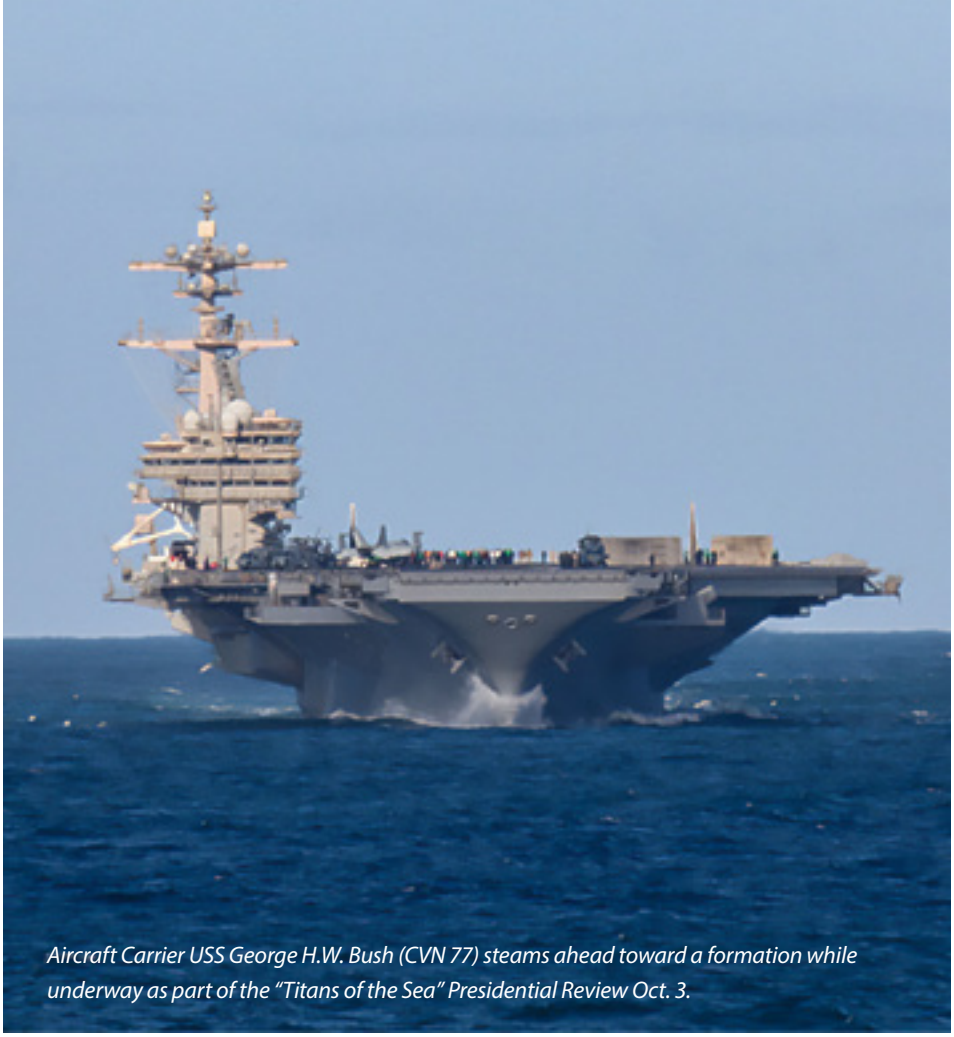
"In every era and every part of this globe, our sailors have fought with courage in their hearts, patriotism in their souls and salt water in their veins."

Prior to the start of the pier events, the Nimitz-class nuclear-powered aircraft carrier USS George H.W. Bush (CVN 77) hosted a "Titans of the Sea" Presidential Review in the Atlantic Ocean for Trump and his official party. The demonstration aired live on the piers at Naval Station Norfolk and showcased some of the Navy's most advanced aircraft, ships and weapon systems in action.

The units involved in the Presidential Review included George H.W. Bush, Virginia-class submarine USS Iowa (SSN 797) and guided-missile destroyers USS Gonzalez (DDG 66), USS Cole (DDG 67), USS Ross (DDG 71), USS Donald Cook (DDG 75), USS Mason (DDG 87), USS Farragut (DDG 99) and USS Delbert D. Black (DDG 119). Navy SEALs assigned to Naval Special Warfare Group 2 executed a fast-rope insertion and boarding event on Gonzalez. Aircraft from Carrier Air Wing (CVW) 1 filled the skies above George H.W. Bush with a formation flyover, targeting drills and several aerial demonstrations showcasing the unmatched capabilities of Naval Aviation.

"Two hundred and fifty years ago, the Continental Congress made a bold bet: who controls the seas, controls the future. This was the birth of our Navy, a testament to our historic significance," Phelan said. "Today, we showed the world what American seapower means: deadly precision, meticulous execution, raw power and the will to use it."

The Presidential Review at sea combined



*Aircraft Carrier USS George H.W. Bush (CVN 77) steams ahead toward a formation while underway as part of the "Titans of the Sea" Presidential Review Oct. 3.*

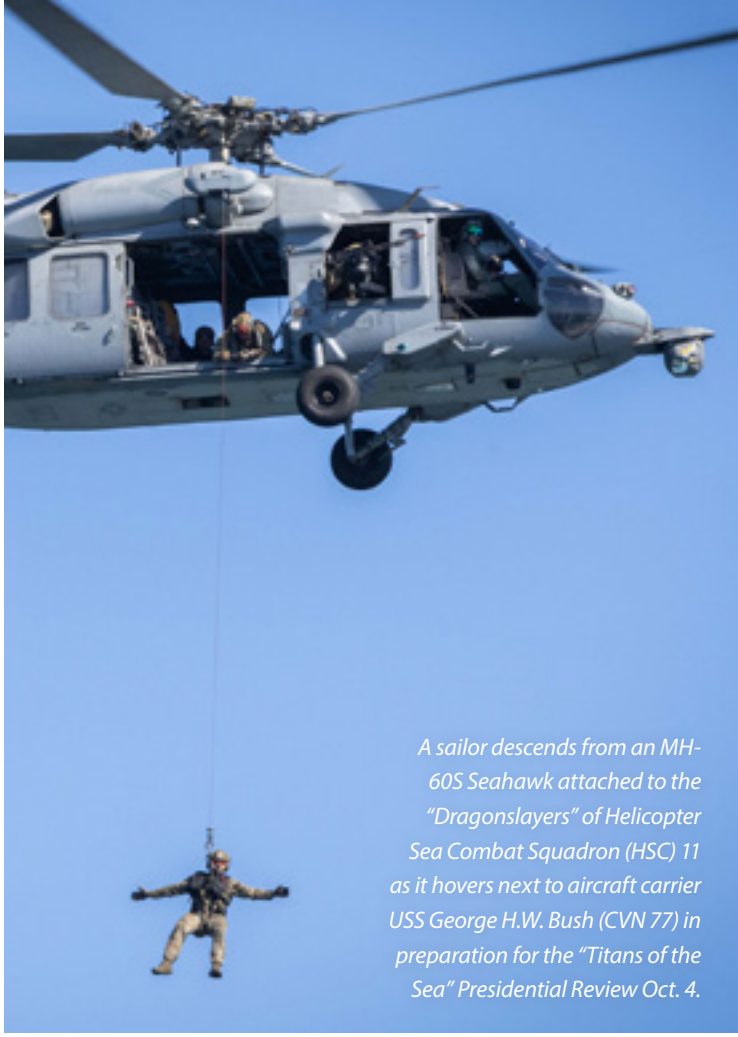
U.S. Navy photo by Lt. j.g. Matthew Weinberger

*Eight F/A-18 Super Hornets, two F-35C Lightning IIs and one E-2D Hawkeye conduct a carrier airwing flyover above the aircraft carrier USS George H.W. Bush (CVN 77) during the "Titans of the Sea" Presidential Review Oct. 5.*

U.S. Navy photo by MCSN Alexander Sticklen

*An F-35C Lightning II attached to Strike Fighter Squadron (VFA) 86 flies over the Nimitz-class aircraft carrier USS George H.W. Bush (CVN 77) during the "Titans of the Sea" Presidential Review dress rehearsal Oct. 4.*

U.S. Navy photo by MC1 Robert S. Price



*A sailor descends from an MH-60S Seahawk attached to the "Dragonslayers" of Helicopter Sea Combat Squadron (HSC) 11 as it hovers next to aircraft carrier USS George H.W. Bush (CVN 77) in preparation for the "Titans of the Sea" Presidential Review Oct. 4.*

U.S. Navy photo by MCSN Francisco Linares



*The Arleigh-Burke class guided-missile destroyer USS Ross (DDG 71) fires a Standard Missile 2 (SM-2) during the "Titans of the Sea" Presidential Review Oct. 5.*

U.S. Navy photo by MCSA Juan SerratosGuzman

*An F/A-18F attached to the "Pukin' Dogs" of Strike Fighter Squadron (VFA) 143 conducts a pass over aircraft carrier USS George H.W. Bush (CVN 77).*

U.S. Navy photo by MCSA Juan SerratosGuzman

*Arleigh Burke-class guided-missile destroyers fire type 2 standard missiles while underway as part of the "Titans of the Sea" Presidential Review Oct. 3.*

U.S. Navy photo by MCSN Jayden Howard

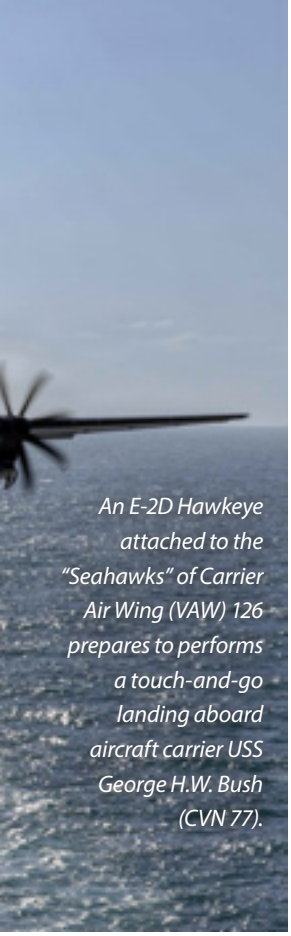
*Three P-8 Poseidons fly over the Nimitz-class aircraft carrier USS George H.W. Bush (CVN 77) in preparation for the "Titans of the Sea" Presidential Review Oct. 4.*

U.S. Navy photo by MCSN Abigail Reyes

*Aircraft carrier USS George H.W. Bush (CVN 77) transits the Atlantic Ocean while four F/A-18E Super Hornets, attached to the "Pukin' Dogs" of Strike Fighter Squadron (VFA) 143, drop bombs for a "Wall of Water" showcase in support of the "Titans of the Sea" Presidential Review.*

U.S. Navy photo by MC2 Mitchell Mason

*An MV-22B Osprey attached to the "Nighthawks" of Marine Helicopter Squadron One (HMX-1) lands on the flight deck aboard aircraft carrier USS George H.W. Bush (CVN 77) in preparation for the "Titans of the Sea" Presidential Review.*



An E-2D Hawkeye attached to the "Seahawks" of Carrier Air Wing (VAW) 126 prepares to performs a touch-and-go landing aboard aircraft carrier USS George H.W. Bush (CVN 77).

U.S. Navy photo by MCSN Abigail Reyes

President Donald J. Trump, center, First Lady Melania Trump, right, and Rear Adm. Alexis Walker, commander, Carrier Strike Group 10, participate in a "Titans of the Sea" Presidential Review aboard aircraft carrier USS George H.W. Bush (CVN 77).

U.S Navy photo by MC2 Daniel Gonzalez

An MH-60S Seahawk attached to the "Dusty Dogs" of Helicopter Sea Combat Squadron (HSC) 7 launches flares during an air demonstration Oct. 5.

U.S. Navy photo by MCSN Alexander Sticklen

An F-35C Lightning II assigned to the "Rough Raiders" of Strike Fighter Squadron (VFA) 125 maneuvers above the Nimitz-class aircraft carrier USS George H.W. Bush (CVN 77) Oct. 5.

U.S. Navy photo by MCSA Zachary Steward

U.S. Navy photo by MCSN Abigail Reyes

a series of training events into one milestone demonstration. While opportunities for ships, aircraft and submarines to train together occur regularly, a demonstration of this magnitude rarely happens due to the extensive coordination required across various warfare areas.

"Today the president witnessed firsthand the unmatched combat power of the United States Navy. What he saw up close—our ships, submarines, aircraft and special operations forces demonstrating what makes our Navy so special, so lethal. These forces represent only a fraction of what our Navy delivers around the world every single day," Caudle said. "But more important than the platforms and capabilities are the sailors who bring them to life. They are professional, patriotic Americans—warriors who stand ready at a moment's notice to defend our nation and its interests. It is their skill, courage and dedication that make ours the most formidable Navy in history."

Commander, U.S. 2nd Fleet, Vice Adm. Doug Perry and his staff oversaw the execution of the Presidential Review and the seamless transition to the pier celebration.

"We were honored to host the president, secretary of war and secretary of the Navy in the Atlantic. For 250 years, America's warfighting Navy has sailed the globe in defense of freedom and honed our ability to conduct prompt and sustained combat operations at sea. Today we were able to demonstrate why our Navy remains the elite fighting force in the modern world," Perry said. "The Navy's legacy continues today in our sailors, whose readiness and professionalism remain the foundation of our nation's security."

The "Titans of the Sea" Presidential Review and Naval Station Norfolk all-hands call are two of many events taking place throughout the country to showcase maritime capabilities as part of the U.S. Navy's 250th birthday.

U.S. 2nd Fleet, reestablished in 2018 in response to the changing global security environment, develops and employs ready maritime forces to fight across multiple domains in the Atlantic and Arctic to ensure access, deter aggression and defend U.S., allied and partner interests.

*An MH-60S Seahawk from Helicopter Sea Combat Squadron (HSC) 25 prepares to land on the flight deck of the forward-deployed amphibious assault ship USS America (LHA 6) while conducting flight operations in the Coral Sea, July 1.*

U.S. Navy photo by MCSN Sam McNeely

# INTO THE FIGHT, INTO THE SEA:

## HSC-25's Search and Rescue Mission

*By Petty Officer 2nd Class Amy Mullins*

**Embarked aboard the forward-deployed amphibious assault ship USS America (LHA 6), Helicopter Sea Combat Squadron (HSC) 25 Detachment 6 trains hard to carry out one of the Navy's most demanding and essential missions: search and rescue (SAR). Whether someone is lost at sea, injured on land or caught in a life-threatening situation, HSC-25 is trained and ready to respond at a moment's notice.**

SAR missions require more than just skill, however—they demand constant teamwork, intense physical and mental preparation, and well-maintained aircraft that can perform under pressure. Aircrew assigned to HSC-25 regularly conduct mock recovery missions to prepare for real emergencies. These drills can involve rescuing a swimmer lost at sea, recovering someone who has fallen overboard or locating a missing hiker. But, training isn't just about practicing known scenarios—it's also about preparing for the unexpected.

Naval Aircrewman (Helicopter) 2nd Class Gabriel Andaya, DET 6 Operations lead petty officer, is a crew chief, rescue swimmer and door gunner with HSC-25. He explains being a rescue swimmer is both physically and mentally demanding. Swimmers must be ready to swim in 20-foot waves for at least 30 minutes, all while managing equipment, staying aware of their environment and helping someone who may be panicked, unconscious or injured.

"A rescue swimmer is expected to know the aircraft systems to help locate a survivor and set up the cabin for rescue," Andaya said. "Once on scene, we assess the situation: Are they entangled? Do they have flotation? Are they conscious or unconscious? Everything changes based on the survivor's condition."

A typical day of training can quickly go from calm to intense.


*An MH-60S Seahawk from Helicopter Sea Combat Squadron (HSC) 25 prepares to land on the flight deck of the forward-deployed amphibious assault ship USS America (LHA 6) while conducting flight operations in the Coral Sea, July 1.*

U.S. Navy photo by MCSN Sam McNeely

**"Since its formation in 1984, HSC-25 has launched 2,445 missions, resulting in 762 medical evacuations and 475 lives saved from the waters and jungles across the Pacific island chains."**

One moment, it is a routine flight. The next, there is a call on the radio: A vessel is capsizing nearby. From that moment, Andaya said, "You have two minutes to change out of flight gear and into swimmer gear to begin the search."

Aircraft issues or changing conditions often force swimmers to adapt their plans mid-mission. Even in training, survivors may lack flotation and accidentally put the swimmer at risk as they try to stay above water.

## Staying Calm Under Pressure Is Key

"Your job is to take control of the situation. But, it's not over once the survivor is safe. The rescue swimmer and crew chief are also responsible for providing care during the flight back," he said.

While training is essential, the real impact of HSC-25's mission comes into focus during live rescues.

Andaya recalled a particularly memorable mission that shows the heart behind SAR.

"On a Sunday afternoon in Guam, I got a call about a man on a remote island, 104 nautical miles away, who had a broken pelvis and was bleeding internally. The local hospital was too small to treat him, and he had about four hours before his condition would become critical."

The landing zone was a small park-


U.S. Navy photo by MCSN Sam McNeely

*Sailors chock and chain an MH-60S Seahawk from Helicopter Sea Combat Squadron (HSC) 25 to the flight deck of the forward-deployed amphibious assault ship USS America (LHA 6) while conducting flight operations in the Coral Sea, July 7.*

ing lot, with just 40 feet of rotor clearance. Fuel was limited, and there was no nearby refueling option, giving the team only 20 minutes on the ground. On top of that, the sun had set—the entire operation required night vision goggles. Andaya and his team landed safely, retrieved the patient and provided in-flight care as the SAR medical technician administered medicine. After a 2-hour and 15-minute flight, they arrived at a hospital with advanced care. The next day, they learned the patient's surgery was successful and he had stabilized.

"It wasn't the craziest flight I've ever had," Andaya said, "but I definitely slept better that night, knowing I helped someone when they were at their lowest."

Every successful mission depends on more than just the crew in the air. The MH-60S Seahawk helicopter, also known as the Knighthawk, is a complex aircraft requiring constant care. The maintenance crew performs daily inspections and emergency repairs to ensure it is always mission ready.

In the cockpit, pilots handle communication and maintain a stable hover. The crew chief deploys swimmers and communicates water conditions, while the rescue swimmer secures and assists the survivor.

## Behind Every Flight Is a Unified Goal: Save Lives—Fast and Safely

Since its formation in 1984, HSC-25 has launched 2,445 missions, resulting in 762 medical evacuations and 475 lives saved from the waters and jungles across the Pacific island chains.

HSC-25 also supports a wide range of missions beyond SAR, including Helicopter Visit Board Search and Seizure (VBSS); Maritime Interdiction; Non-Traditional Intelligence; Surveillance; and Reconnaissance (NTISR); VERTREP (Vertical Replenishment); and Close Air Support using Hellfire missiles, rockets and crew-served weapons.

None of this would be possible without the coordination between skilled aviators, rescue swimmers, maintainers and mission planners.

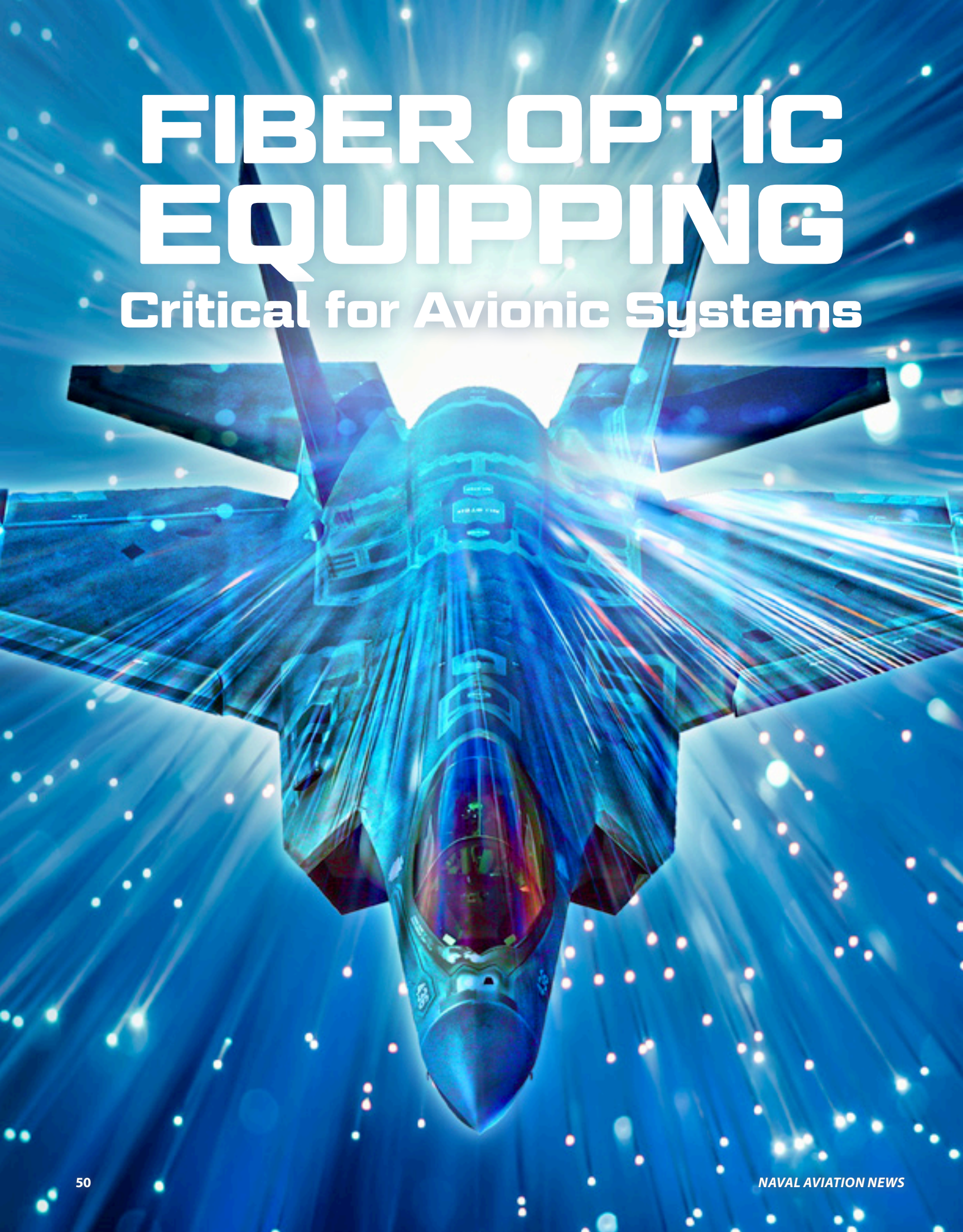
HSC-25 is the Navy's only forward-deployed MH-60S expeditionary squadron, flying missions across the U.S. 7th Fleet. They support USS America (LHA-6) and all ships connected to the America Strike Group under Commander Task Force 76, providing anti-surface warfare, special operations support, combat logistics, SAR and humanitarian aid capabilities. HSC-25 remains ready to protect lives—anywhere, anytime, under any conditions.

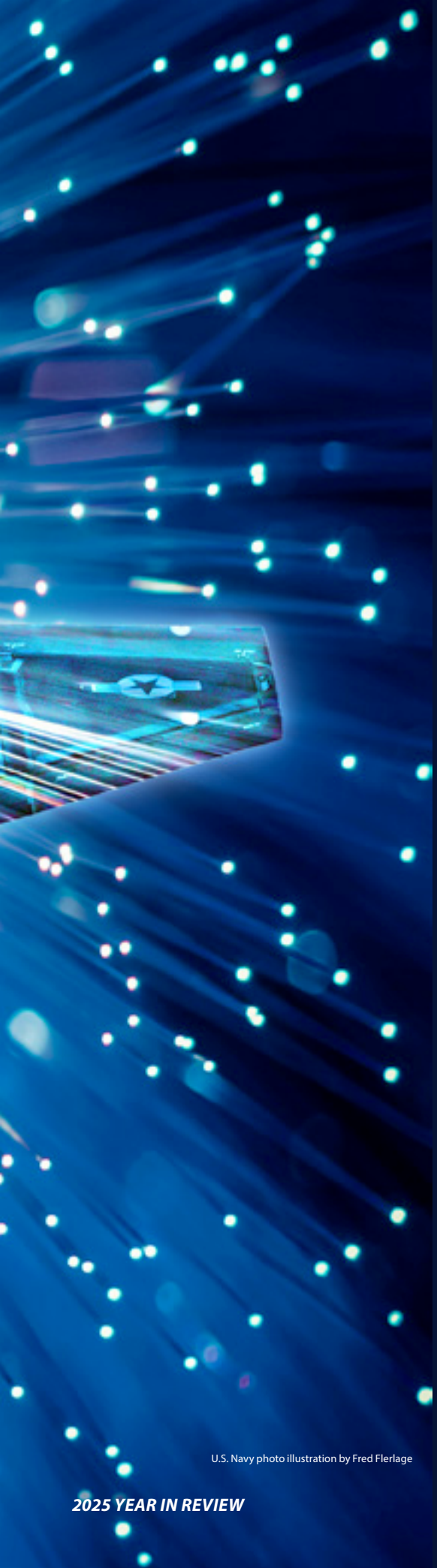
America, lead ship of the America Amphibious Ready Group, is underway conducting routine integrated operations in U.S. 7th Fleet area of operations. U.S. 7th Fleet is the U.S. Navy's largest forward-deployed numbered fleet that interacts and operates routinely with allies and partners to preserve a free and open Indo-Pacific region.

*Petty Officer 2nd Class Amy Mullins is a public affairs officer for USS America (LHA-6).*

# FIBER OPTIC EQUIPPING

## Critical for Avionic Systems





U.S. Navy photo illustration by Fred Flerlage

*By the Air Combat Electronics Program Office*
*Avionics Architecture Team*

**The need for high-speed communication is real and critical. In an era with hypersonic weapons, sixth-generation fighters and a proliferation of autonomous systems, the ability to collect vast amounts of sensor data and make time-critical decisions faster has never been more paramount to surviving on the 21st century battlefield.**

To emphasize this importance, imagine a group of hypersonic missiles are closing in on an aircraft at Mach 5. If the plane can detect hypersonic missiles at 80 miles out, the pilot has one to two minutes to respond versus 15 to 20 seconds to respond at 20 miles out. For Naval Aviation, response time can mean maneuvering, employing electronic or physical countermeasures, or firing a missile. Keep in mind the response does not happen instantaneously, nor does it have a 100% chance of being effective (if only there was sufficient time for multiple response attempts to maximize the probability of survival).

To maximize response time in varying mission situations, aircraft are employing more powerful sensor solutions to detect threats at longer distances. These sensors include various forms of electro-optical, radar and electronic warfare suites. To detect threats at longer ranges while maintaining the same coverage area, aircraft must capture significantly more raw data by either increasing sensor resolution, capture rates or number of sensors. Increasing the amount of sensor data an aircraft captures is not as easy as it sounds and creates a variety of secondary technological challenges. These secondary challenges involve the processing and transporting of the

Photo courtesy of Colins Aerospace

*Pictured is a crewman wearing an F-35 Gen III Helmet-Mounted Display System.*

raw sensor data in the same or faster time interval so the pilot can then respond appropriately. The first secondary challenge—processing—can be sped up through a combination of improved hardware, parallelized computing and developing more efficient processing approaches. The other secondary challenge involves transporting data around the aircraft. Raw sensor data is not inherently useful by itself; it is merely a collection of structured numbers. Further processing is needed to extract meaning from the raw sensor data. The challenge is that this raw sensor information is not always captured by the same avionics system that processes the sensor information. The sensor data must be transported by some means from the sensor to an avionics computer that can be located up to tens of meters away from a given sensor.

## Fiber Optic Versus Electrical Signaling

There are two primary ways of transporting the raw sensor information around naval aircraft: electrical and fiber optics. Electrical signaling has been the incumbent approach on aircraft since digital avionics systems became available in the 1960s. For more than 50 years, this approach has worked well and still does for many applications. However, to better understand the need for fiber optics, transporting information around an aircraft can be divided into two types of problems: 1) transporting information within an avionics system (short distance); and 2) transporting information out of an avionics system to a physically separated avionics system (long distance). When signals are transported at a short distance or when the data rate is low, electrical signaling is the preferred signaling method.

As the amount of data to be transported between avionics systems further increases, it becomes increasingly difficult to send a higher volume of data more than a short distance using electrical signaling while maintaining signal integrity.

Additional factors like signal attenuation, crosstalk, signal reflections, electro-magnetic interference and environmental elements become increasingly difficult to overcome. The key is to be combat effective, in that an aircraft must operate reliably over a wide range of austere conditions. This can include freezing arctic environments, a corrosive saltwater environment or scorching desert conditions. In addition, there can be a large amount of electric noise in and around the aircraft that makes reliable high-speed electric communications challenging. Electronic noise can come from generators, AC power lines, motors, RF signals

| Situation Electrical | Fiber Optic Signaling | Signaling |
|---|---|---|
| Short Distance Low Data Rate | ✔ | ✔ |
| Short Distance High Data Rate | | ✔ |
| Long Distance Low Data Rate | ✔ | ✔ |
| Long Distance High Data Rate | | ✔ |

*Figure 1: Preferred signaling approach in different situations*

and adjacent electrical cables. Fiber optics has the advantage of being high speed as well as immune to electromagnetic interference (EMI). And when ruggedized, it can operate over the range of needed environmental conditions. These qualities, in addition to others like reduced size, weight, power and longer lifespan, make fiber optics the ideal candidate for high data rate system-to-system avionics communications.

## How Fiber Optics Meet Naval Aviation Mission Needs

While fiber optics is the optimum solution for high-speed system-to-system communications for military aircraft, there have been some challenges slowing its adoption and implementation. Over the last several years, the needs of data centers and the aerospace industry have diverged. The drive for higher speeds and lower cost fiber optic components has led to a series of compromises on the structural and environmental robustness of a sizable percentage of these components. This is due to most of the fiber optics market being aimed toward indoor usage, i.e., in data centers where a far lower range of temperatures and environmental extremes are present. For military aircraft to meet future system-to-system high speed data transmission needs—that of advanced fiber optics technologies that can operate at high speed (25 gigabytes per second [Gbps], 100 Gbps or more) and meet harsh environment requirements—it must be matured and ruggedized.

The Navy is supporting multiple efforts through small business innovation research (SBIR) to develop digital avionics high-speed and high-power optical components. This includes transmitters, receivers and transceivers operating at 100 Gbps or more, as well as wavelength division multiplexing technologies and fiber optical cables for avionics high-speed applications. In addition, the Navy has been funding the development of innovative fiber optic packaging methods, fiber optic components that meet the operating environment per military specification, and fiber optic components with improved power budget. It also includes improved fiber optics system architectures, methods for fiber optic component qualification, improvements in the fiber optic installation and installation verification process, and various types of fiber optic support equipment.

The current and future investments in fiber optics technologies are critical to maturing and ruggedizing industry fiber optic technologies. They also advance the supporting technologies required to maintain capabilities of the fiber optics components throughout the long lifecycle of military aviation platforms. The Navy continues to be involved in open standards development to provide better guidance and specification requirements for the technologies under development.

Overall, current and future focused dedication into ruggedized fiber optic high-speed technologies is essential for enabling faster system-to-system communications on military aviation platforms. This more faster communication capability can be used to enable enhanced capabilities for maintaining technological dominance well into the 21st century and provide our warfighters the edge they need to succeed.

*From the Air Combat Electronics Program Office Avionics Architecture Team.*

**"As the amount of data to be transported between avionics systems further increases, it becomes increasingly difficult to send a higher volume of data more than a short distance using electrical signaling while maintaining signal integrity."**

U.S. Navy photo illustration by Fred Flerlage

# Seconds to Spare: A SAILOR'S FIGHT FOR LIFE IN THE EYE OF THE STORM

*By Mass Communication Specialist 2nd Class Julianna J. Lynch*

**The order to cancel evening flights came down at 8:15 p.m. April 7, a reprieve from a rapidly approaching storm that promised to shroud USS Gerald R. Ford (CVN 78) in darkness and rain. But, before the last helicopter could be secured, a different kind of emergency ripped through the ship—a sailor collapsing, an emergency call over the 1 Main Circuit (1MC) and a desperate race against time and Mother Nature.**

Cmdr. Sean Rice, the executive officer assigned to Helicopter Sea Combat Squadron (HSC) 9, was preparing for a 9 p.m. flight when word came of the cancellation of the last two cycles of the evening. Severe convective weather threatened the divert airfields, making conditions too dangerous for flight operations. The storm was moving faster than anticipated, and its arrival at Ford's location was imminent.

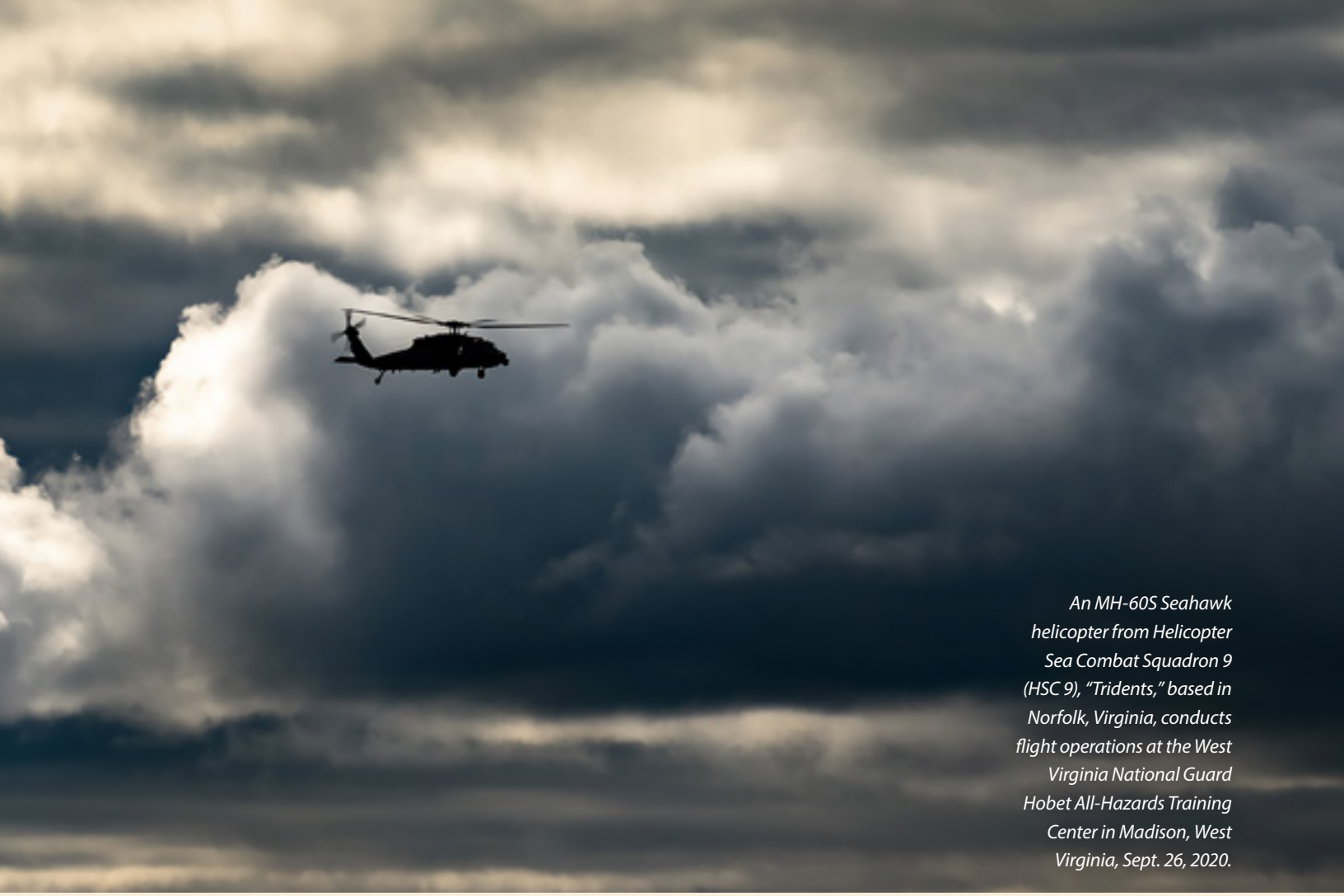
Abruptly, the rapid, insistent peal of bells reverberated through the narrow passageways of the ship, and "Medical emergency, medical emergency!" could be heard over the 1MC (the shipboard public address circuits on Navy vessels). The ship's medical team sprang into action. When they arrived at the gym, they found sailors performing CPR on an unresponsive crewmember. The patient had been running on the treadmill, then stopped, convulsed and collapsed on the floor between rows of equipment.

Lt. Elizabeth Uecker, Ford's physician assistant, called Lt. Carlos Robles, the ship's nurse, from the scene.

"It's happening. We are doing CPR. We need medications, and you need to get up here!"

Robles' boots pounded the floor as he ran to the crash cart in Main Medical, pulled medications and told the nurse anesthetist to grab his gear for intubation.

In the gym, the Medical Response Team was on round six of CPR. They worked in sync, their movements precise and practiced. They placed defibrillator pads on the sailor as the team gave



*An MH-60S Seahawk helicopter from Helicopter Sea Combat Squadron 9 (HSC 9), "Tridents," based in Norfolk, Virginia, conducts flight operations at the West Virginia National Guard Hobet All-Hazards Training Center in Madison, West Virginia, Sept. 26, 2020.*

U.S. Army National Guard photo by Edwin L. Wriston

rescue breaths. The first rhythm check came back—ventricular fibrillation, no pulse. As the defibrillator charged, every pair of eyes in the room watched the monitor. They delivered the shock and CPR resumed. Another check—no pulse.

After 15 rounds of CPR and the administration of epinephrine, the patient's pulse returned, signaling he could be moved down to Main Medical.

After intubation and stabilization, the Corpsmen transported the patient swiftly through the ship to Main Medical. The path ahead was a gauntlet: across the gym, down a ladderwell, through the maze of aircraft in the hanger bay, into the medical staging area elevator and finally down to the second deck and into Medical. There, Lt. Cmdr. Jordan Robinson, the ship's surgeon, immediately took control as they made the decision to transport the sailor off the ship to the nearest Level 1 trauma center. The medical team reassessed the patient's vital signs, confirmed and secured the airway, started necessary medications and quickly completed lab work to stabilize the patient for the flight ahead.

In the Combat Direction Center, an undercurrent of tension ran through the group as flight preparations kicked into overdrive. Capt. Christopher Williams, Ford's executive officer, moved with focused urgency to mobilize the medical evacuation (MEDEVAC) coordination team. Several departments—Operations, Security, Weapons, HSC-9 and Destroyer Squadron (DESRON) 2—were called in to execute a plan.

The storm still loomed, its unpredictability casting doubt on whether the helicopter could make it to Shands Medical Center in Jacksonville, Florida, at all. Each choice involved a calculated risk.

Lt. j.g. Melvin Williams, Rice's co-pilot, and Naval Aircrewman 3rd Class Haevinn Kahala, both assigned to HSC-9, sprinted to the aircraft. They prepared the helicopter and ensured the cabin was ready for a litter-bound patient in desperate need of care. At the same time, two of the squadron's seasoned medical professionals—Hospital Corpsman 2nd Class Damiano Bonadonna and freshly-qualified aircrew paramedic Naval Aircrewman 2nd Class Sean Winterburn—volunteered to join the crew and provide critical medical support during the perilous flight.

"The HSC-9 pilots and crew had the helicop-

U.S. Navy photos by MC2 Maxwell Orlosky

*Naval Aircrewman (Helicopter) 3rd Class Dane Palmer is hoisted by an MH-60S Seahawk, attached to the "Tridents" of Helicopter Sea Combat Squadron (HSC) 9, on the flight deck of the world's largest aircraft carrier, USS Gerald R. Ford (CVN 78), during training, Nov. 7, 2024.*

ter ready and spinning long before we were even close to sending the patient," said Cmdr. Kristina O'Connor, Ford's senior medical officer. "They were monitoring the storm with precision, getting constant updates on the weather and adjusting their flight path on the fly. Once the patient was loaded, without hesitation, they were off."

**"With 60 nautical miles to go, sudden turbulence tossed the helo from side to side, lightning intensified and the headwind roared to nearly 50 knots, but the patient's condition demanded they press on."**

Everything was set in motion. The storm was the only thing standing between the crew and their destination. They had identified Shands Medical Center as the closest safe haven, but even as they plotted the course, weather reports from Florida's divert airfields showed conditions were deteriorating rapidly.

The ship's meteorologists delivered vital updates. The radar painted a dire picture: A violent line of storms was churning from the coast of the Carolinas south to Florida, positioned squarely between the ship and Jacksonville. But, there was a break in the storm's progression that allowed for a narrow opening in the weather, and the crew saw their chance to move southward toward the city. Rice and his crew chief, Naval Aircrewman 1st Class John Kainoa, gathered all required information and proceeded to the helicopter.

At 10:45 p.m., the crew launched into the night sky, immediately greeted by sheets of rain, intense lightning and towering clouds. Engulfed by the storm, they aimed for a tiny sliver of clear sky—the helicopter's only visible path. An additional airborne helicopter from Helicopter Maritime Strike Squadron (HSM) 70 provided real-time weather information for Rice's crew to avoid the storm and maintain visual conditions as long as possible. Despite their vital assistance, the weather gave them no choice but to punch through the rain and clouds and proceed via instrument navigation.

Robles, Bonadonna and Winterburn worked to stabilize the patient during the transit. The patient's vital signs were deteriorating. While battling turbulence that shook the aircraft violently, and

operating under the dim glow of limited light, they administered lifesaving medication with precision, their hands steady despite the chaos around them. Every decision, every movement, was deliberate as they worked in near darkness with unwavering focus.

With 60 nautical miles to go, sudden turbulence tossed the helo from side to side, lightning intensified and the headwind roared to nearly 50 knots, but the patient's condition demanded they press on. Rice called for deviation—a plea for a lower altitude from the shore-controlling agency. Even though they might lose radar contact, the orders came to descend to 3,000 feet. Rice then requested a further drop to 2,000 feet, demanding maximum performance of the aircraft while knowing the calculated risks he needed to take to deliver his crew and their patient safely.

Slowly, the headwind began to fade, and the sky began to quiet as the lightning retreated. As the clouds began to part, the dim, distant lights of the Jacksonville skyline emerged through the haze—offering a promise of safety amid the storm. But, the situation remained critical. Shands Medical Center came into view, and the crew executed a flawless approach. The aircraft touched down at 12:07 a.m. The medical team transferred the patient swiftly to Shands' Intensive Care Unit.

"In more than 3,000 hours of military flying experience, this was by far the most challenging and dangerous weather conditions I have ever encountered on any flight, much less one at night, long range from ship," Rice said.

The sailor's initial prognosis was less than 15% chance of survival. But, the crew refused to concede, and despite the odds, the patient is recovering. A mission that could have ended in tragedy became a testament to courage, skill and teamwork.

Rice and Williams both received Navy Commendation Medals, and Robles, Kainoa, Kahala, Winterburn and Bonadonna received the Navy and Marine Corps Achievement Medal on April 13 in recognition of their lifesaving efforts and heroic actions.

*Mass Communications Specialist 2nd Class Julianna J. Lynch is a communications specialist with USS Gerald R. Ford (CVN 78).*

U.S. Navy photo By PO2 Julianna Lynch

*Sailors assigned to Helicopter Sea Combat Squadron (HSC) 9 receive awards in recognition for their life-saving efforts and heroic actions during a medical evacuation while abord USS Gerald R. Ford (CVN 78). From left to right: Naval Aircrewman 3rd Class Haevinn Kahala, Naval Aircrewman 2nd Class Sean Winterburn, Hospital Corpsman 2nd Class Damiano Bonadonna and Naval Aircrewman 1st Class John Kainoa received the Navy and Marine Corps Achievement Medal while Lt. j.g. Melvin Williams and Cmdr. Sean Rice, the executive officer of HSC-9, received the Navy and Marine Corps Commendation Medal.*

# MARINES, AIR FORCE FIGHT AS
# IN NAVY'S JOINT SIMU

*An F-35B Lightning II touches down during the aircraft's first landing on Marine Corps Air Station New River, North Carolina, September 2019.*

*By Naval Air Warfare Center Aircraft Division Public Affairs*

**For the first time, Marine Corps F-35 Lightning II and Air Force F-22 Raptor pilots trained as a joint fighting force March 24-27 in the Naval Air Warfare Center Aircraft Division's (NAWCAD) Joint Simulation Environment (JSE) at Naval Air Station Patuxent River, Maryland.**

The training event brought eight Marine Corps F-35s to train alongside four Air Force F-22s in the DOW's most advanced digital test and training range.

"This milestone is a game-changer that ushers in a new era of interoperability for aviation's combat community and served as a pivotal exercise getting NAWCAD ready to make this joint training standard for Navy and Air Force fighters starting this spring," said former NAWCAD Commander Rear Adm. John Dougherty IV.

During the event, F-35B and F-35C pilots from Marine Fighter Attack Squadrons (VMFA) 122, 225 and 311 trained with several F-22 pilots from the Combat Air Forces and test community. Over two days, F-35 and F-22 pilots practiced fifth-generation fighting together in 17 simulated combat missions against advanced enemy threats only available at JSE. After each mission, the pilots reviewed their performance using cockpit video and audio recordings.

"The cross talk [while training in the JSE] is unparalleled in terms of being able to talk tactics [and] actually get in the same room with people," said F-22 pilot Capt. Brett Myer. "It helps iron out a lot of the small details that really matter when it comes down to it."

Real-world training on open-air ranges at this scale is expensive, difficult to coordinate and lacks a realistic threat environment. The JSE solves this problem by providing defense aviation a secure simulated range that puts pilots in threat environments not replicable in real life.

"At the end of the day, it's going to be the people that win our nation's wars," said VMFA-225 pilot Maj. Patrick Kaufer. "Having those person-to-person connections between the Air Force, the Navy and the Marine Corps [in the JSE] is the most important part and biggest objective that we're able to achieve."

Developed by NAWCAD engineers and industry partners, the JSE is a digital training and test facility that features realistic domed simulators with actual defense hardware, software and adversary aircraft. The immersive environment enables pilots flying F-35 and F-22 to practice complex combat scenarios and receive instant feedback, accelerating the learning process and honing their skills. Tactical groups training in the JSE fly more sorties in one week than they fly over a year on open-air ranges.

NAWCAD's JSE is formally integrated into the Navy's Strike Fighter Tactics Instructor Program—commonly known as TOPGUN—and efforts are underway to incorporate JSE training across additional warfighter programs.

# JOINT FORCE FOR FIRST TIME

# LATION ENVIRONMENT

*An F-22 Raptor assigned to the 1st Fighter Wing, Joint Base Langley-Eustis, Virginia, arrives at Royal Air Force Lakenheath, England, October 2018.*

U.S. Navy photo illustration by Fred Flerlage

NAWCAD expanded JSE's capabilities with the addition of a highly realistic E-2D Advanced Hawkeye in 2025, and add the F/A-18 Super Hornet and EA-18G Growler in 2026.

NAWCAD's military, civilian and contract personnel operate test ranges, laboratories and aircraft in support of test, evaluation, research, development and sustainment for all Navy and Marine Corps aviation platforms. Based in Patuxent River, Maryland, NAWCAD also has major sites in St. Inigoes, Maryland; Lakehurst, New Jersey; and Orlando, Florida.

*From Naval Air Warfare Center Aircraft Division Public Affairs.*

*A pilot trains in the Joint Simulation Environment (JSE) at the Naval Air Warfare Center Aircraft Division in Patuxent River, Maryland. Tactical pilots from the Marine Corps and Air Force conducted the first joint training exercise, flying simulated combat missions together in F-35 and F-22 fifth-generation fighter jets in the JSE March 24-27.*

U.S. Navy photo by Terri Thomas