GA-ASI Flies MQ-20A Avenger UAS Completely Autonomously

An Avenger MQ-20A, which recently flew using an artificial intelligence pilot. *GENERAL ATOMICS AERONAUTICAL SYSTEMS*

SAN DIEGO – General Atomics Aeronautical Systems Inc. used a company-owned Avenger MQ-20A unmanned aircraft system to fly a military aircraft using an artificially intelligent pilot deployed on an operationally relevant, open mission systems software stack on Sept. 12, the company said.

The Avenger's completely autonomous flight used the AI pilot for close to 30 minutes as a part of a cooperating live, virtual and constructive UAS swarm. The flight was performed as part of GA-ASI's ongoing commitment and investment into the development of advanced autonomy of AI and machine learning for UAS.

The flight made use of GA-ASI's novel Reinforcement Learning architecture to develop and validate an RL agent in an operationally relevant environment. RL agents provide a new and innovative tool for next-generation military platforms to make decisions under dynamic and uncertain real-world

conditions. The team flew “chase and avoid behavior” where real-time updates were made to the flight path to avoid adversaries using live fused tracks. Live tracks were provided to the system using the Infrared Search and Track sensor network supplied by Lockheed Martin.

“The flight was a tremendous success and demonstrated a number of groundbreaking capabilities in the race to operationalize autonomy for collaborative combat aircraft,” said GA-ASI Senior Director of Advanced Programs Michael Atwood. “It’s exciting to see how AI can be used to advance how and where we fly unmanned systems as the complexity of the battlespace increases. Our ‘chase and avoid’ agent’s ability to dynamically update the flight path as threats were identified is the first step towards building an ecosystem of collaborative autonomous combat aircraft.”

TacIRST is a new class of multifunction, embeddable sensor system with an open architecture. It was developed by Lockheed Martin to provide a range of capabilities for both crewed and uncrewed aircraft. “We anticipated the need for passive, long-range threat detection by autonomous aircraft and are proud to see this capability integrated successfully on the Avenger,” said Terry Hoehn, Director of Lockheed Martin’s Advanced Threat Warning Systems. “We look forward to further collaboration and testing with GA-ASI.”

The team used a government-furnished CODE autonomy engine and the government-standard OMS messaging protocol to enable communication between the RL agent and the Tactical IRST. By utilizing government standards, such as CODE and OMS, rapid integration of autonomy for collaborative combat aircraft becomes possible.

General Dynamics Mission Systems also supplied key technologies to the flight. The mission computer used to host the OMS software is part of the Digital Backbone Node family of systems from General Dynamics Mission Systems. The DBN

architecture enables rapid and secure deployment of evolving capabilities needed for CCA through application of the latest government open architectures, high-performance computing, advanced cooling, and a high-speed backplane with multi-level security to maximize battlefield collaboration between platforms.

This flight was another in an ongoing series of autonomous flights performed by GA-ASI using internal research and development funding to prove out important AI/ML concepts for advanced UAS.

ONR SCOUT Tests Tech for Monitoring Illicit Maritime Cargo

Vessels participate in an ONR SCOUT-sponsored experimentation event at Joint Expeditionary Base Little Creek-Fort Story, Virginia, at the entrance of the Chesapeake Bay. *U.S. NAVY / Max Hopkins, Demonstration Assessment Team, Naval Surface Warfare Center Indian Head Division*

ARLINGTON, Va. – To improve capabilities for monitoring aircraft and vessels carrying illicit maritime cargo such as drugs, for longer periods of time and over greater distances, the Office of Naval Research-sponsored SCOUT initiative recently conducted a dynamic experimentation event at Joint Expeditionary Base Little Creek-Fort Story, Virginia, at the entrance of the Chesapeake Bay.

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The goal of the event was to find creative solutions to pinpoint "dark targets" – aircraft or watercraft operating with little to no radio-frequency signatures – found in maritime operating areas covered by the Joint Interagency Task Force South, ONR said in a Sept. 19 release. It sought ways to

use unmanned technologies to expand intelligence, surveillance and reconnaissance capabilities beyond those of traditional maritime patrol aircraft such as the P-3 Orion and P-8 Poseidon.

JIATF-S currently works with U.S. Southern Command and partner naval forces to leverage all-domain technologies and unmanned capabilities to target, detect and monitor illicit drug trafficking in the air and maritime domains. This facilitates interdiction and apprehension to reduce the flow of drugs, as well as degrade and dismantle transnational criminal organizations.

ONR SCOUT is an ongoing, multiagency experimentation campaign for identifying alternative ways to bring unmanned technologies to warfighter problems, operationalize them and bring them to scale. SCOUT is committed to getting nontraditional, commercial-off-the-shelf, government-developed and/or government-sponsored technologies to the fleet rapidly.

“SCOUT is an innovation vehicle and investment strategy for the rapid development of autonomous platforms that address today’s warfighter challenges,” said Chief of Naval Research Rear Adm. Lorin Selby. “Through experimentation with partners like JIATF-S, we can connect innovators, industry, acquisition professionals and fleet stakeholders to attack and solve key operational problems.”

“This is a pressing issue for JIATF-S because every day multiple suspect vessels are near and in the area of operations conducting illicit trafficking,” said U.S. Coast Guard Lt. Cmdr. Duane Zitta, JIATF-S chief of operational demonstration and experimentation. “Because of this vast area, JIATF-S is looking for alternative capabilities and technologies to provide unmanned counter-operations that can detect and monitor suspect activity, ultimately helping

prevent illegal movement to the United States.”

The JEB Little Creek-Fort Story experimentation event was a partnership involving ONR SCOUT, JIATF-S, the Naval Research and Development Establishment, and industry partners in the Chesapeake Bay area. It was one of multiple sprint events (scenario-based demonstrations of technology capabilities and characteristics) held this year that will lead to a large-scale main experimentation event in March 2023.

During the Chesapeake Bay event, participants engaged in simulated drug-running and -hunting scenarios during “cat-and-mouse” games involving a specialized vessel owned by SOUTHCOM and JIATF-S, a “Gotcha” boat formerly used by drug traffickers and seized by JIATF-S, and various targets of interest.

Participants employed sophisticated sensor systems and technologies, ranging from coordinated unmanned aircraft systems to wide-area motion imagery. Data collected during the exercises was fed into an onsite maritime operations center and synthesized, providing operators with real-time information about targets and each technology’s performance.

The technology tested at JEB Little Creek-Fort Story will undergo further refinement and improvement before the March 2023 main experimentation event.

USCGC Oliver Henry Concludes Operation Blue Pacific Expeditionary Patrol

The Sentinel-class fast response cutter USCGC Oliver Henry (WPC 1140) accesses the mooring ball in Apra Harbor Sept. 18, following more than 16,000 nautical mile patrol through Oceania. *U.S. COAST GUARD / Petty Officer 2nd Class Sean Ray Blas*

SANTA RITA, Guam – The Sentinel-class fast response cutter USCGC Oliver Henry (WPC 1140) arrived at homeport in Guam on Sept. 19, following a patrol across Oceania, U.S. Coast Guard Forces Micronesia said in a release.

“The crew of Oliver Henry just completed a 43-day historic patrol across Oceania, where we patrolled and visited ports in the Federated States of Micronesia, Papua New Guinea and Australia. We also patrolled the exclusive economic zones of

those countries and Solomon Islands during our time," said Lt. Freddy Hofschneider, commanding officer of Oliver Henry. "Our trip was significant in that we validated the capability of the fast response cutters homeported here in Apra Harbor, Guam, showing what we can do to promote regional stability in terms of fisheries and continue to build a better relationship with our regional partners.

The crew conducted training, fisheries observations, community and key leader engagements and a multilateral sail. They covered more than 16,000 nautical miles from Guam to Cairns, Queensland, Australia, and returned with several stops in Papua New Guinea and one in the Federated States of Micronesia.

"The fact that we can take these 154-foot ships with a crew of 25 and a lieutenant commanding officer and push them so far over the horizon, even as far as Australia – which is what Oliver Henry just did – is an incredible capability for the region," said Capt. Nick Simmons, commander of U.S. Coast Guard Forces Micronesia/Sector Guam.

In Papua New Guinea, the crew spent time on Manus Island and Port Moresby. They visited HMPNGS Tarangau School, spent time in the community, and engaged with Papua New Guinea Defence Force and local officials.

In Cairns, they conducted engagements with Australian Defence and Home Affairs partners, the mayor of Cairns, and Cairns Regional Council representatives. They also took time to engage with the International Marine College. Upon departure, they participated in a multilateral formation sail with crews from Australia and Fiji as the other ships departed for Exercise Kakadu off Darwin.

During their stop in Pohnpei, Oliver Henry's crew hosted the U.S. Embassy team and an FSM National Oceanic Resource Management Authority – Fisheries Compliance Division

representative to cover patrol highlights and future opportunities. The Oliver Henry commanding officer visited the FSM National Police Maritime Wing headquarters to discuss multilateral efforts. Finally, members of the cutter's engineering team conducted a subject matter expert exchange with the crew of FSS Palikir, the last active Pacific-class patrol boat, on shipboard repairs and preventative maintenance.

The Oliver Henry is the 40th Sentinel-class fast response cutter. The ship was commissioned along with its sister ships, Myrtle Hazard (WPC 1139) and Frederick Hatch (1143), in Guam in July 2021.

International Naval Forces Partner in Seychelles to Build Cooperation

Cutlass Express participating forces perform visit, board, search, and seizure training in Victoria, Seychelles, Feb. 15. Cutlass Express, sponsored by U.S. Africa Command and conducted by U.S. Naval Forces Africa, is designed to improve regional cooperation among participating nations in order to increase maritime safety and security in the East Africa regions. *U.S. NAVY / Mass Communication Specialist 2nd Class Daniel Charest*

MANAMA, Bahrain – The world's largest multinational naval partnership, Combined Maritime Forces (CMF), launched a two-week mission in the Indian Ocean island nation of the Seychelles with other international organizations Sept. 18 to strengthen regional collaboration and enhance operational readiness, said Combined Maritime Forces public affairs.

CMF is leading Operation Southern Readiness in partnership with the Seychelles People's Defence Force, European Union Naval Force, United Nations Office on Drugs and Crime, and India which began partnering with CMF earlier this year. This is CMF's first iteration of Operation Southern Readiness.

"Seychelles is a strong regional maritime partner and we are very grateful for them hosting this new opportunity," said Vice Adm. Brad Cooper, commander of U.S. Naval Forces Central

Command, U.S. 5th Fleet and CMF. “We are also excited to work with other international partners, including India, to train and build capacity in a vibrant way.”

Nations including Australia, Canada, France, India, Italy, New Zealand, Saudi Arabia, Seychelles, the United Kingdom and the United States are slated to participate with personnel, ships and aircraft during several training events.

Multinational forces will conduct training on visit, board, search and seizure techniques; search and rescue operations; maritime law and information sharing.

“The training is designed to enable our partners to meet face-to-face and learn from one another and is only possible because of the teamwork and commitment from all partners,” said Royal Canadian Navy Cmdr. Alexis Dieryckx, CMF’s senior mission planner. “It’s all about building relationships because relationships are the fundamental building blocks for greater collaboration at sea.”

CMF consists of 34 member nations whose forces operate in the Red Sea, Gulf of Aden, Northern Arabian Sea, Gulf of Oman, Arabian Gulf and Indian Ocean.

CMF nations are united in upholding international rules-based order to protect the free flow of commerce, ensure regional maritime security and deter illicit activity by non-state actors.

Coast Guard Offloads More

than $475M in Illegal Narcotics in Miami

Bales of illegal drugs, worth an estimated $475 million, are offloaded onto pallets, Sept. 15, at Coast Guard Base Miami Beach, Florida. The illegal narcotics were offloaded by the crew of the U.S. Coast Guard Cutter Legare (WMEC 912). *U.S. COAST GUARD / Chief Petty Officer Stephen Lehmann*

MIAMI – The crew of the USCGC Legare (WMEC 912) offloaded approximately 24,700 pounds of cocaine and 3,892 pounds of marijuana, worth an estimated $475 million, Sept. 15, at Base Miami Beach, the Coast Guard Atlantic Area said in a release.

The drugs were interdicted in the international waters of the Caribbean Sea and the Eastern Pacific Ocean by crews from:

- His Netherlands Majesty's Ship HNLMS Groningen (P843) of the Royal Netherlands Navy and embarked U.S. Coast Guard Law Enforcement Detachment 101

- U.S. Navy ship USS Billings (LCS 15) and embarked USCG LEDET 401
- Coast Guard Cutter James (WMSL 754)
- Coast Guard Cutter Legare (WMEC 912)

“I am proud of the crew’s continued devotion to duty that made this offload possible,” said Cmdr. Jeremy M. Greenwood, commanding officer of Legare. “Through the coordinated efforts of the Legare, the LEDETs, HNLMS Groningen, CGC James, and the USS Billings crews, we significantly contributed to the counter-drug mission and the dismantling of transnational criminal organizations. The drugs seized through this coordinated effort will result in significantly fewer drug-related overdoses.”

The fight against drug cartels in the Caribbean Sea and Eastern Pacific Ocean, and the transnational criminal organizations they are associated with, requires a unity of effort in all phases; from detection and monitoring to interdiction and apprehension, and on to criminal prosecutions by international partners and U.S. Attorneys’ Offices in districts across the nation.

The Legare is a 270-foot Famous-class medium-endurance cutter stationed in Portsmouth, Virginia. Legare’s missions include Law Enforcement, Search and Rescue, Protection of Living Marine Resources, Homeland Security and Defense Operations, international training, and humanitarian operations. Legare patrols the offshore waters from Maine to Florida, the Gulf of Mexico, the Eastern Pacific, and the Caribbean.

Ishee Assumes Command of U.S. 6th Fleet and Naval Striking and Support Forces NATO

Vice Adm. Thomas E. Ishee relieved Vice Adm. Gene Black III as commander, U.S. 6th Fleet and commander, Naval Striking and Support Forces NATO in a change of command ceremony held onboard U.S. Naval Support Activity Naples, Italy, Sept. 15. *U.S. NAVY*

U.S. NAVAL SUPPORT ACTIVITY NAPLES, Italy – Vice Adm. Thomas E. Ishee relieved Vice Adm. Gene Black III as commander, U.S. 6th Fleet and commander, Naval Striking and Support Forces NATO (STRIKFORNATO) in a change of command ceremony held onboard U.S. Naval Support Activity Naples, Italy, Sept. 15.

Adm. Stuart Munsch, commander, U.S. Naval Forces Europe-Africa (NAVEUR-NAVAF) and commander, Allied Joint Forces Command Naples, presided over the ceremony. Munsch outlined Black's

extensive accomplishments as 6th Fleet commander and presented Black with the Distinguished Service Medal.

“Gene has sustained an unprecedented level of activity as the fleet commander for the Euro-Atlantic area, recalibrating our combined forces for dynamic operations, as the tenets of strategic competition dictate, to deter Russian aggression and stand ready to defend NATO,” said Munsch. “No one can look at the tenor you’ve set and argue that our adversaries haven’t factored your warfighting command of 6th Fleet and STRIKFORNATO into their calculus.”

As 6th Fleet commander and deputy commander of NAVEUR-NAVAF, Black provided regional, national and international leadership with credible Navy and NATO combat capabilities across the European and African areas of operations. He also spearheaded the establishment of a European Navy-Marine Corps task force (Task Force 61 Naval Amphibious Forces Europe/ 2d Marine Division (TF-61/2)). TF 61/2 is charged with command and control of high-end U.S. forces, including Amphibious Ready Groups and Marine Expeditionary Units; Reconnaissance and Counter-Reconnaissance Marines; and intelligence and collection units able to integrate with theater allies and partners.

“The establishment of Task Force 61/2 has brought an enhanced rapid response capability to the 6th Fleet area of operations and has displayed the strength and flexibility of the Navy-Marine Corps team,” said Brig. Gen. Andrew Priddy, commanding general of TF 61/2.

Additionally, Black’s leadership of STRIKFORNATO yielded the first transfer of authority of a U.S. Carrier Strike Group to NATO since the Cold War, setting a new standard in NATO cohesion and cooperation. 6th Fleet and STRIKFORNATO executed multiple phases of the Project Neptune series in 2021 and 2022, expanding transfer of authority of allied carrier strike groups and of the USS Kearsarge (LHD 3) ARG and 22nd MEU,

substantially increasing flexibility and cohesion throughout the alliance.

“Demonstrating and enhancing NATO’s high-end maritime warfare capabilities shows the world the true strength and teamwork of our alliance,” Black said of Neptune Shield, held in May 2022. “NATO’s capacity to conduct integrated operations in the maritime domain … validates more than seven decades of Alliance interoperability.”

Ishee, previously the Director of Global Operations for U.S. Strategic Command, spoke of his appreciation for the team he will lead, while outlining his vision and goals for the command.

“History is unfolding before our eyes, and our nation, the alliance, other allies and our partners around the world are relying on 6th Fleet and STRIKFORNATO to maintain freedom of navigation, defend our nations and the alliance, and support our partners,” said Ishee. “We will continue to build these enduring relationships through training and exercises, common values, and shared experiences and vision.”

Black has been selected for reappointment to the grade of vice admiral and assignment as deputy chief of naval operations for operations, plans, and strategy, N3/N5, Office of the Chief of Naval Operations, Washington, D.C.

U.S. 6th Fleet is permanently assigned to NAVEUR-NAVAF, and employs maritime forces through the full spectrum of joint and naval operations.

Commandant: Long-Range USV Will Be Primarily an ISR Platform That Launches Unmanned Assets

The Long-Range Unmanned Surface Vessel, being developed for the U.S. Marine Corps. *METAL SHARK*

ARLINGTON, Va. — The Long-Range Unmanned Surface Vessel (LRUSV) under development will primarily serve as an intelligence, surveillance, and reconnaissance platform for the U.S. Marine Corps once it is fielded, Marine Corps Commandant Gen. David H. Berger said Thursday during a virtual event hosted by Defense One.

Berger said the Marines are keenly interested in the distance the platform can cover, as well as its ability to launch other

unmanned assets.

“What does it allow us to do that we can’t do right now? One is range across the surface of the water,” he said. “The second is we’re going to use it primarily not as a kinetic platform, but as an unmanned vessel that can launch unmanned collection systems. Now you’re really doubling the reach of where you can collect, where you can inform yourself about what’s happening in front of you.”

He added that the platform can be used on the electromagnetic spectrum to deny adversaries from collecting information against U.S. Navy assets.

“So the long-range unmanned surface vessel, primarily for us we’re looking at it as an ISR platform on the surface of the water that allows us to stretch out, to see what’s in front of us at much greater depth,” Berger said, “and then launch unmanned platforms in the air or on the surface or subsurface even farther. If we had to do that by humans right now, it would be manned vessels, manned aerial platforms, limited by range and the fatigue level, the endurance level, of a human being.

“This allows us to generate a whole lot of tempo and keep a shield, keep a screen out in front of us much more persistently,” he said.

The platform is currently located in the Norfolk, Virginia, area and will soon be transported to Hawaii, Berger said.

Although the LRUSV may be focused on ISR missions, the vessel is likely to get some lethal capabilities as well. Multiple reports indicate the Marines plan to acquire loitering munitions that can be launched from autonomous boats like the LRUSV.

First Australian MQ-4C Triton to Arrive in Mid-2024, Official Says

The Australian government's first MQ-4C Triton was unveiled Sept. 15 in Palmdale, California. *NORTHROP GRUMMAN*

PALMDALE, Calif. – The Australian government will receive its first MQ-4C Triton unmanned aircraft at Royal Australian Air Force (RAAF) Base Tindal in the Northern Territory in 2024, an official said at an unveiling ceremony here Sept. 15.

Air Vice-Marshal Robert Denney, the RAAF head of Air Force capability, said during the ceremony that when the RAAF receives the aircraft, it will be used for many capabilities beyond its core intelligence, surveillance, and reconnaissance

functions.

“It will revolutionize the ways the Australian Defense Forces conduct operations with our allies,” he said.

The aircraft was unveiled at manufacturer Northrop Grumman’s high-altitude, long-endurance aircraft production site in Palmdale. Both Australian and U.S. government officials were on hand to talk about the Triton and the ongoing cooperation between Australian and U.S. defense forces.

Australia was a cooperative program partner in the Triton program as it was being developed. As a result, they will be able to share data with the United States that is collected by both countries’ Tritons.

Rear Adm. Stephen Tedford, program executive officer for Unmanned Aviation and Strike Weapons for the U.S. Navy, said during the ceremony that continued partnership between Australia and the United States will “allow both of our nations to better project military power, maintain our competitive edge, and maintain peace and stability in the region.”

He noted that Australian personnel had been embedded in the Triton program since 2009.

“Since that time, this platform has expanded its capabilities far beyond those it started with,” he said. “I am confident that our dedicated team … will work tirelessly to deliver this aircraft and many more to come.”

The MQ-4C provides persistent ISR capabilities in a maritime environment, making it useful as a long-endurance surveillance platform in the Asia-Pacific region.

Northrop Grumman started building the first Australian Triton in October 2020 at its facility in Moss Point, Miss. In December 2021, the fuselage and one-piece wing were joined

together in Palmdale. Production completion is planned for 2023 ahead of delivery in 2024.

Littoral Combat Ship USS Coronado Decommissioned

Capt. Marc Crawford, center, commodore of Littoral Combat Ship Squadron ONE, gives the order to decommission Independence-variant littoral combat ship USS Coronado (LCS 4) during a decommissioning ceremony Sept. 14. *U.S. NAVY / Mass Communication Specialist 2nd Class Vance Hand*

SAN DIEGO – Independence-variant littoral combat ship USS Coronado (LCS 4) was decommissioned in San Diego, Sept. 14, the Navy said in a release.

As on operational unit, Coronado and its crew played an

important role in the defense of the nation and maritime freedom. As a test and training ship, Coronado and its Sailors were key to determine the operational configuration and deployment capabilities of today's LCS platform.

"Today we recognize the great contribution Coronado and its crew made in developing the operational concepts foundational to the current configuration and deployment of littoral combat ships," said Rear Adm. Wayne Baze, the ceremony's guest speaker and commander of Expeditionary Strike Group 3. "Thanks to Coronado, the future of LCS looks bright."

Coronado and its Sailors contributed a tremendous amount of work and time to ensure the future success of the LCS program during the ship's time in naval service. The ship worked alongside allied and partner nations while on a 14-month rotational deployment to the Indo-Pacific in 2017, including inaugural port visits to Cam Ranh, Vietnam and Lamut, Malaysia. While deployed, Coronado supported presence operations and maritime security operations to include the advancement of the LCS manned-unmanned teaming concepts through successful targeting exercises with an embarked MQ-8B Fire Scout. The ship's successful operations demonstrated the relevance of LCS as a platform that provides flexible options and tactical advantages.

"Since April 5th, 2014, Coronado has been the vanguard for proving the capabilities of the LCS platform and establishing the mission sets," said Cmdr. Spike Lamson, Coronado's commanding officer. "The dedication of her crews and supporting teams have guaranteed the future success of this class of ship and the crews that will operate them over-the horizon. I am proud to have served alongside her Sailors, and I am grateful for the opportunity to give Coronado the farewell she deserves."

Built by Austal USA in Mobile, Alabama, Coronado was commissioned April 5, 2014, at Naval Air Station North Island.

The ship deployed to U.S. 7th Fleet, integrated with a carrier strike group, performed exercises with partner navies and conducted joint maneuvers with other U.S. Navy warships. Upon decommissioning, Coronado will be designated as Out of Commission, In Reserve asset, and its Sailors will receive follow-on orders to new assignments.

The first USS Coronado (PF 38) served in World War II and was decommissioned in 1945. The second USS Coronado (AGF 11) served in U.S. 2nd, 5th and 6th Fleets and as the flagship for Commander, U.S. 3rd Fleet. The second Coronado was decommissioned in 2006 and sunk during Exercise Valiant Shield in 2012.

AeroVironment Introduces Puma VNS, a Visual-Based Navigation System for Small UAS

An illustration of a Puma small UAS equipped with the new Puma VNS, which determines the precise location of an aircraft during flight without relying on GPS. *AEROVIRONMENT*

ARLINGTON, Va. – AeroVironment Inc. on Sept. 15 introduced Puma VNS, a visual-based navigation system for Puma 2 AE and Puma 3 AE small unmanned aircraft systems that will enable GPS-denied navigation across increasingly GPS-contested environments.

The system will provide operators with continually advanced navigation capabilities, features and functionality through anticipated software and hardware updates, the company said in a release. The system will also enable the integration of future autonomy capabilities.

“Puma VNS gives operators an unprecedented advantage in the battlefield,” said Trace Stevenson, AeroVironment vice president and product line general manager for SUAS. “Operators now can execute missions with more confidence in GPS-contested environment with the system’s new navigational capabilities.”

The next-generation navigation system features a suite of down-looking sensors that gather imagery data and track

features on the ground, as well as an embedded compute module to process and determine the precise location of an aircraft while it is in flight. Designed with the operator in mind, the system automatically transitions to and from GPS-denied navigation mode without any input from the operator.

Puma VNS is available as an add-on option for new Puma 3 AE system orders and as a retrofit kit for fielded Puma 2 AE and Puma 3 AE systems.