Navy Demonstrates AI Autonomy on BQM-177A Target

The Navy’s Strike Planning and Execution (PMA-281) and Aerial Targets (PMA-208) programs demonstrate artificial intelligence-based autonomy on BQM-177A aerial target during a test event Aug. 5 at Point Mugu Sea Test Range, Calif. (Photo courtesy of Shield AI)

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NAS PATUXENT RIVER, Md. – The Navy’s Strike Planning and Execution (PMA-281) and Aerial Targets (PMA-208) programs recently partnered with Shield AI to demonstrate artificial intelligence-based autonomy on the BQM-177A aerial target.

During the Aug. 5 event at Point Mugu Sea Test Range in California, Shield AI successfully flew two BQM-177As – one demonstrating Advanced Vehicle Control Laws (AVCL), a core capability for integrating autonomy, and the other incorporating additional autonomous behaviors.

AVCL is a foundational software layer that enables aircraft to fly complex, dynamic maneuvers by translating high-level

mission commands into real-time flight control inputs. For the BQM-177A, AVCL allows for more threat-representative flight profiles and the kind of maneuvering seen in adversary tactics.

“The team has successfully demonstrated Advanced Vehicle Control Laws (AVCL) while adding some autonomy elements on our BQM-177A aerial target. When fully integrated, this capability will enhance the BQM-177A’s ability to execute more threat-representative maneuvers and simulate realistic interactions with fleet assets, providing more effective test and training scenarios for the Warfighter,” said Greg Crewse, PMA-208 program manager.

The BQM-177A replicates modern subsonic anti-ship cruise missile threats and supports a range of missions with its internal and external payload options. It plays a key role in both developmental and operational testing for fleet training.

Kratos, the BQM-177A’s manufacturer, integrated AVCL into the air vehicle as part of a broader development effort. Once fully implemented, AVCL will enable the BQM-177A to perform more advanced maneuvers and closer engagements, allowing the target to more accurately simulate interactions with manned ships.

“This is a significant step in demonstrating how the Navy can plan and execute missions with a combination of manned and unmanned aircraft. The use of a combination of virtual and low-cost live air vehicles allows us to evaluate the effectiveness of multi-platform missions at a fraction of the cost of a full-scale live exercise,” said Capt. Toby Keith, PMA-281 program manager. “Integrating autonomy into existing systems allows us to fly and evolve how we plan and execute autonomous platform missions before the air vehicles are even built.”

The Navy and Shield AI plan to conduct a second technology demonstration later this year, featuring up to two BQM-177As flying simultaneously. The event will test multi-platform coordination, mission planning, and human-machine interface integration to assess how operators interact with and direct multiple autonomous systems in real time.

The Navy awarded a contract to Shield AI in August 2024 to integrate its Hivemind AI pilot software and deliver a robust prototype test bed using the BQM-177A to demonstrate autonomous operations during flight. Hivemind allows aircraft to operate independently using real-time sensor data and onboard processing to make decisions, plan routes and execute maneuvers without remote input. The software is designed as an open, modular platform that can be used across a range of DoD systems.