# Project Link: New T-45 Mixed Reality Trainer Improves Readiness

Shown is a T-45C prototype mixed reality cockpit view. Note: Dials, displays, and out-of-the-cockpit view are virtual images while the cockpit panels and buttons are seen in the "real world" via a video pass-through camera.
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PATUXENT RIVER, Md. – The Naval Aviation Training Systems and Ranges Program Office (PMA-205) and the Naval Air Warfare Center Training Systems Division (NAWCTSD) are bringing the future of training to student aviators with the new T-45C Goshawk mixed-reality simulator, also known as Project Link.

The Navy is pioneering emerging technologies through the Naval Aviation Training Next (NATN) program, focusing on extended reality (XR) for aviation training. XR encompasses virtual reality (VR), augmented reality, and mixed reality (MR), offering immersive experiences by blending virtual and real worlds.

Project Link is one of several efforts aligned under the NATN program advancing aviation training by exploring the use of XR trainers; providing individualized training syllabi; and improving performance assessment through updated methods, metrics, and measurements.

The NATN program is an innovative initiative by the U.S. Navy to use advanced technologies like VR and artificial intelligence to streamline and enhance the training process for new student naval aviators. While AR/VR/MR training solutions do not entirely replace other methods of training, the benefits of these systems can be profound.

Recent technological advancements made MR a promising solution for flight training, with MR trainers showing potential in supplementing operational flight trainers and offering greater realism and immersion through a blend of virtual and physical cockpit elements.

“I am excited about the feedback from Chief of Naval Air Training instructors and students on mixed reality technology,” said Capt. Kevin McGee, PMA-205 program manager. “Industry has been improving mixed reality over the past five to seven years and I believe MR is now mature enough to provide significant value in the virtual training environment, replacing some of the larger, more expensive visual projector systems that are employed in our pilot training systems.”

An initial capability evaluation of the T-45C MR simulator prototypes, conducted by the Naval Undergraduate Flight Training Systems Program (PMA-273), assessed their capability to support future procurement decisions for the undergraduate jet training pipeline. Despite closely resembling the T-45C Goshawk cockpit and using commercial head mounted display systems for visual projection, the prototypes faced some limitations in certain functionalities. The PMA-205/NAWCTSD team addressed the discrepancies and improved the system

fidelity, leading to the procurement of four training devices delivered to Meridian, Mississippi, in April. Through the Office of the Under Secretary of Defense for Research and Engineering's Accelerate the Procurement and Fielding of Innovative Technologies (APFIT) program, the Navy procured an additional 20 systems with eight to arrive in Meridian and 12 to be delivered to Kingsville, Texas, in 2025.

"These systems reached a level of readiness that allowed for their delivery and immediate integration into training programs. This successful outcome demonstrates the effectiveness of collaborative efforts in refining and advancing military training technologies," said Cmdr. Lee "Scampi" Sciarini, deputy director, Research and Technology Programs, Naval Air Warfare Center Training Systems Division (NAWCTSD).

Lt. Cmdr. Joseph Geeseman, PMA-205 Science and Technology Portfolio manager, emphasized the importance of fleet feedback during the development process.

"These user-evaluation events provide the development teams the opportunity to more narrowly focus their efforts, ensuring that the T-45C MR trainer end product not only meets training requirements, but also exceeds fleet expectations in the look, feel, and ease-of-use of these leading-edge training systems," Geeseman said.