



October 28, 2015

## Manned flight simulator continues to advance modeling and simulation after 30 years

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From left, Delegate Tony O'Donnell; Delegate Deb Rey; Rachel Jones, assistant to Senator Mikulski; Amy Markowich, director of the Integrated Battlespace Simulation and Test Department; Chad Miller, division head of the Simulation Division; and County Commissioner Todd Morgan participated in the rededication ribbon-cutting ceremony held at the Manned Flight Simulator facility Oct. 15 at Patuxent River, Md. (U.S. Navy photo)

**NAVAL AIR SYSTEMS COMMAND, Patuxent River, Md.** — This year marks the 30<sup>th</sup> anniversary of NAVAIR's [Manned Flight Simulator](#) (MFS) facility, a center of excellence for aircraft simulation. What began as a place to perform ground testing of the F/A-18 mission computer prior to in-flight testing has grown into an innovative cross platform facility for modeling and simulation (M&S), and test and evaluation (T&E) of integrated warfighting capabilities.

Thirty years ago, MFS opened its doors for T&E. Today, it stands as a premier facility having hosted many greats such as John Eugene Cernan, the last man to walk on the moon; Tom Clancy, well-known author; Leon Panetta, former secretary of defense; and Dick Ruttan, renowned test pilot. The MFS facility has grown to support multiple M&S capabilities for various platforms.

Utilizing M&S throughout the acquisition life cycle is vital for reducing risk and saving program funding. At the celebration of MFS' "pearl" anniversary, Amy Markowich, director of the Integrated Battlespace Simulation and Test Department, explained the importance of



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M&S and how facilities such as MFS affect the future of the fleet.

“Modeling and simulation is a key enabler to achieving efficient and effective capability in the fleet,” Markowich said. “There was a time, actually not that long ago, when there were no computers in aircraft systems, no thoughts of computer models, and everything was developed and tested in flight. These flight tests took a great deal of time and were often risky.

“Today, facilities such as MFS harness the power of real-time computing to rapidly develop and thoroughly test powerful new capabilities for our fleet, using models and simulations to complement and minimize flight test for T&E, which can be efficiently accomplished on the ground. This enables programs to identify deficiencies early in development and fix them before deployment.”

Although the facility began with only two simulation cockpits, it now houses nine high-fidelity simulators, including a six-degree-of-freedom motion base providing acceleration/deceleration cues. With an advanced “roll-in, roll-out” methodology, MFS is capable of moving platforms in and out of labs quickly, allowing the facility to adapt rapidly and meet program’s evolving requirements.

MFS supports DoD, DoN and NAVAIR’s vision of using advanced M&S across all platforms. The simulators can also connect to actual aircraft in the Air Combat Environment Test and Evaluation Facility’s (ACETEF) anechoic chamber via 1153 and Link 16 or integrate into range testing to create a true live, virtual and constructive (LVC) environment.

“It is imperative that the [research, development, T&E] community continues to drive open standards and government-managed interfaces across our modeling and simulation enterprise,” Markowich said. “Interoperability of M&S greatly enhances re-use and enables the development of live, virtual and constructive modeling environments that can be shared across all government and industry.”

M&S is a key component for programs to save cost and schedule.

“Simulators play a major role in supporting safety-of-flight analysis prior to flight test and optimizing cost of flight test,” said Michael Piland, F-35 flight test simulation team lead. “When you can [simulate] instead of fly, you’ve saved a dollar. Simulation is a tool that the testers are using to be able to check out the aircraft’s capabilities before they turn it over to the fleet.”

Today, MFS continues to provide flexible simulation capability to test military aircraft, avionics and system software. The facility provides simulation capabilities to support aircraft system ground and flight test activities. The simulators are used for flying qualities and performance evaluations, avionics integration testing, mission scenario rehearsal,



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accident investigations, prototype evaluations, installed systems testing, and prototype simulator design.

MFS is poised to play a major role in T&E and LVC for at least another 30 years.

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Watch the video to learn more!



Manned Flight Simulator began construction at Patuxent River, Md., in the spring of 1984 and finished in the fall of 1985. (U.S. Navy photo)



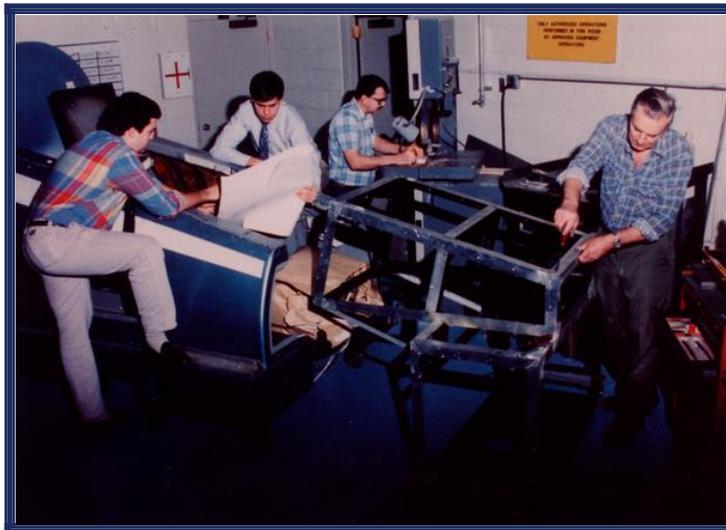
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The first stand-up F/A-18A simulator at Manned Flight Simulator was used to test the mission computer prior to in-flight testing. (U.S. Navy photo)



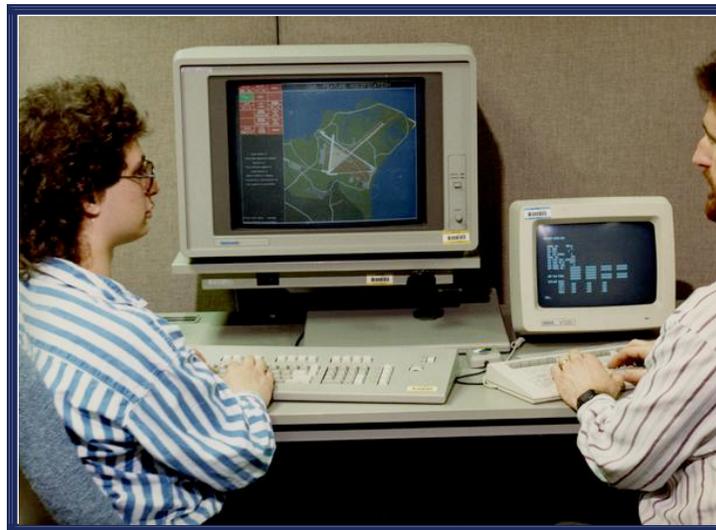
An F-4 procedures trainer is heavily modified to serve as a generic cockpit for fixed wing tactical aircraft in 1988 at the Manned Flight Simulator. (U.S. Navy photo)

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The MFS laboratory utilizes “roll-in/roll-out” full fidelity cockpits to optimize the use of lab space and resources, which means they can reconfigure assets in less than 30 minutes. Here, an F/A-18A cockpit is moved into the 40-foot dome display system in 1993. (U.S. Navy photo)



MFS engineers develop a Patuxent River visual database using a 1980s Era Visual System Modeler's Workstation. Engineers used these workstations to create ship and aircraft visual models as well as visual databases. (U.S. Navy photo)



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Former Chief of Naval Operations Adm. Jonathan Greenert completes a successful carrier trap using the "Magic Carpet" system at the Manned Flight Simulator July 31, 2014. Buddy Denham, a NAVAIR engineer and developer of the Magic Carpet software, explains how the system will significantly reduce pilot workload in bringing the Super Hornet aboard the carrier and reduce aircraft fatigue, extending the life of the aircraft and significantly reducing maintenance costs. (U.S. Navy photo)



The EA-18G undergoes Mission Level testing in the Air Combat Environment Test and Evaluation Facility's (ACETEF) anechoic chamber while integrated with MFS assets via Link 16. (U.S. Navy photo)



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Marine Corps Maj. Kevin Ryan undergoes oxygen deprivation training while operating a simulator at the Manned Flight Simulator facility. (U.S. Navy photo)