

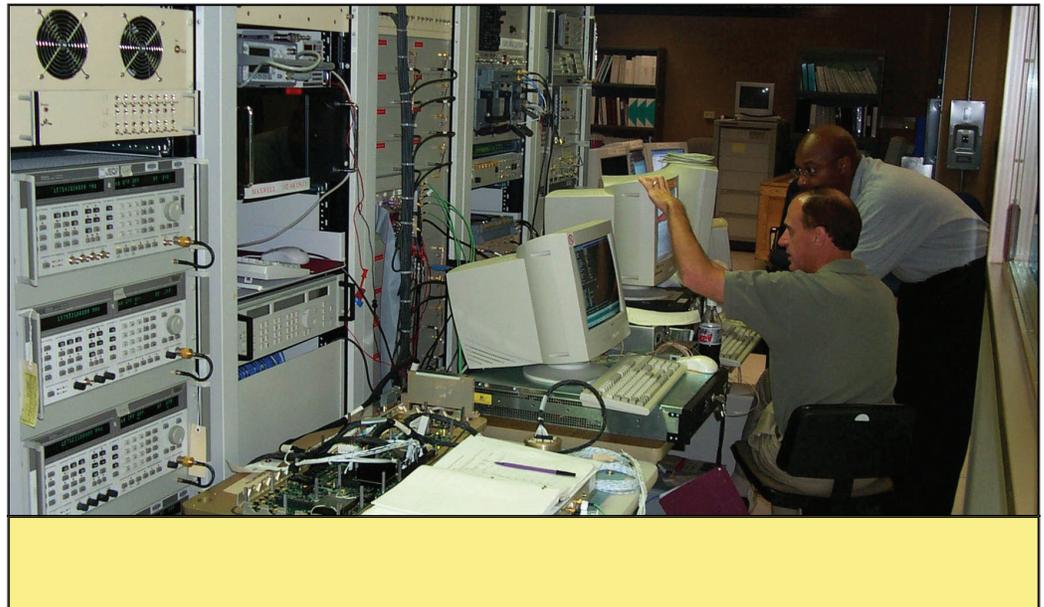


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Science and Technology for Tomorrow's Air and Space Force

Success Story

SENSORS DIRECTORATE SUCCESSFULLY EVALUATES JASSM ANTI-JAM GPS TECHNOLOGY



The Sensors Directorate's Advanced Concepts Exploration Team successfully evaluated the Joint Air-to-Surface Standoff Missile (JASSM) Advanced Global Positioning System (GPS) receiver, using the Antenna WaveFront Simulator (AWS) Virtual Flight Testing (VFT) environment. Directorate engineers used this VFT analysis as a preflight predictor of their JASSM GPS anti-jam performance during a live captive carrier flight test at Holloman Air Force Base, New Mexico as a cost and schedule reduction effort. The JASSM System Program Office also used this flight test to demonstrate the viability of VFT evaluations to assess GPS anti-jam effectiveness for missile applications—a first for the directorate.



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Accomplishment

Working with Lockheed Martin Owego and Orlando, the directorate team integrated the JASSM antenna data, missile trajectory, Holloman AFB jammer laydown, JASSM advanced GPS receiver, and ideal inertial aiding simulation with the VFT. Engineers integrated the JASSM's Missile Computer Unit and Inertial Measurement Unit simulation with the VFT configuration. The directorate then expanded the VFT simulation to include a navigation warfare scenario to thoroughly characterize the performance of the JASSM navigation system.

Background

The directorate developed the AWS to support the evaluation of GPS anti-jam systems for aircraft applications. They recently reconfigured the AWS to model radio frequency ionospheric scintillation effects on GPS receiver performance.

This unique hardware-in-the-loop has now evolved into a VFT capability to meet the ever-increasing challenges associated with GPS modernization and anti-jam research. Directorate engineers interfaced the GPS Interference and Navigation Tool, an Air Force Standard Analysis Toolkit, with the AWS to provide a VFT environment that generates resultant measures of effectiveness.

This capability, coupled with additional modeling and simulation features, such as satellite dynamics, Inertial Navigation System aiding, high-power jammers, and realistic antenna modeling, provides a unique simulation test bed to thoroughly characterize a wide variety of GPS anti-jam technologies. In the JASSM in-house project, this capability clearly demonstrated the viability of using the VFT environment for long-range missile applications.

Sensors
Emerging Technologies

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (02-SN-18)