

## **X-45A To Demonstrate Multi-Vehicle Capabilities At Dryden**

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Two Boeing [NYSE: BA] X-45A technology demonstrators began a new series of flight tests at NASA's Dryden Flight Research Center, Edwards Air Force Base, Calif., on Nov. 4 that, when complete, will demonstrate how both vehicles can fly together in coordinated operations.

As part of this new phase of testing, called Block 2, the Boeing Joint Unmanned Combat Air System (J-UCAS) program will also demonstrate and validate added communications links for air-to-ground and air-to-air coordination and the ability to successfully release inert small smart bombs. The communications links will allow for mission control from not only Edwards Air Force Base where the test program is based, but also from a remote, beyond-line-of-sight location in Seattle.

"Until now, we have been focused on demonstrating the basic airworthiness of the air vehicles, our contingency management and command and control architectures, and basic operator controls and displays," says Darryl Davis, program manager, Phantom Works J-UCAS program, for Boeing. "Because this phase of testing will really start to demonstrate the transformational capabilities of the J-UCAS X-45, it's an important and exciting step forward for the program."

This series of tests consist of between 30 and 35 sorties, including about a dozen involving the T-33 J-UCAS X-45 Surrogate aircraft. Equipped with an avionics pallet fully representative of the X-45A system, the T-33 mimics the X-45A in flying autonomously but also has a pilot for taking control if necessary.

As in the recent X-45A test flight, the series of tests is beginning with a few single-ship checkout operations before moving to coordinated operations between an X-45A and the T-33 surrogate and finally to coordinated operations of both X-45A demonstrators together. Two-ship coordinated taxi operations will precede coordinated flight tests, and a Small Smart Bomb will also be dropped from the X-45A during this testing period.

During earlier Block 1 testing, 48 discrete laboratory, simulation and flight demonstrations were conducted, primarily focused on initial systems checkout. The demonstrations included a total of 16 individual test flights of the two X-45A air vehicles. During initial Block 2 testing earlier this year, the program used the T-33 to successfully demonstrate how a J-UCAS can be integrated with manned aircraft in air-traffic-controlled airspace.

The Joint Unmanned Combat Air System X-45 program is a DARPA/U.S. Air Force/U.S. Navy/Boeing effort to demonstrate the technical feasibility, military utility and operational value of an unmanned air combat system for both the U.S. Air Force and the U.S Navy.

The X-45A technology demonstrators are currently verifying the core functionality of the software necessary for these and related missions. The X-45C/CN concept for the Air Force and Navy will demonstrate the military utility and operational value of the J-UCAS. The first flight for the X-45C will be in mid 2006.

The X-45CN design for the Navy will be based on the Air Force X-45C air vehicle, but will include changes required to demonstrate carrier suitability and other Navy-unique needs. These changes relate to structure, landing gear, a tail hook mechanism and advanced avionics required to demonstrate precision approach and landing. The first flight of the X-45CN air vehicle is scheduled for early 2007.

The J-UCAS is being developed by the Boeing Phantom Works, which is the advanced R&D unit and catalyst of innovation for the Boeing enterprise. By working with the company's business units, it provides advanced solutions and innovative, breakthrough technologies that reduce cycle time and cost while improving the quality and performance of aerospace products and services.

The Boeing Company is the world's leading aerospace company, with its heritage mirroring the history of flight. It is the largest manufacturer of satellites, commercial jetliners, and military aircraft. The company is also a global market leader in missile defense, human space flight, and launch services. Chicago-based Boeing has an extensive global reach with customers in 145 countries.

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