



News Release

Defense Advanced Research Projects Agency

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IMMEDIATE RELEASE

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JOINT UNMANNED COMBAT AIR SYSTEMS' X-45A PROGRAM SUCCESSFULLY COMPLETES BLOCK 3 FLIGHT TESTING

During a combat air patrol mission to provide airborne coverage over an exercise area on February 4, two Joint Unmanned Combat Air Systems (J-UCAS) X-45A air vehicles successfully demonstrated basic autonomous reactive suppression of enemy air defenses functionality, concluding Block 3 software testing.

Block 3 testing, which began in October 2004, helped to demonstrate a number of the key capabilities required when unmanned combat air vehicles conduct operations in dynamic environments. Major accomplishments of this testing included:

Single Vehicle Autonomous Ground Operations. A single X-45A was commanded to taxi from a parking location to the active runway for takeoff. Along the way, it autonomously stopped itself and executed a pre-takeoff test to verify that its systems were functioning correctly. It then continued to the active runway and waited for the operator to command takeoff.

Single Vehicle Dynamic Taxi Control. A single X-45A was commanded to taxi, as in the single vehicle autonomous ground operations. Once in place on the runway, the operator cancelled the mission and the vehicle was commanded to return to park in an alternate location.

Multiple Vehicle Dynamic Taxi Control. Two X-45A vehicles were commanded as in the single vehicle dynamic taxi, but once on the runway, the operator cancelled the mission. While being redirected and rerouted off the runway, the two vehicles communicated with one another and taxied in formation about the airfield, maintaining a constant safe separation distance from each other.

Single Vehicle Beyond-Line-of-Sight Distributed Control. A single X-45A was launched from Edwards Air Force Base/NASA Dryden Flight Center under the control of an operator located at the local mission control station. While in flight, control of the vehicle was handed to an operator in a Seattle mission control station via a beyond-line-of-sight UHF SATCOM link. To verify command and control, the Seattle operator ordered a number of maneuvers and then passed control back to the local Edwards operator for landing.

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Multiple Vehicle Distributed Control. This demonstration was similar to the single vehicle distributed control demonstration but had both X-45A vehicles airborne when command and control was passed via line-of-sight communications from one mission control station at Edwards/Dryden to a separate mission control vehicle, also located at Dryden.

Reactive Suppression of Enemy Air Defenses. Also called the “Peacekeeping” mission, this demonstration had two X-45A vehicles patrol separate areas and detect computer-generated pop-up threats. Based on relative vehicle ground speeds to the threat’s location, and vehicle weapons load and fuel state, the vehicles made a determination on which vehicle had a better “shot.” The operator reviewed the attack plan developed by the system and approved the simulated attacks prior to execution.

Preparations are currently underway for testing the fourth and final block of X-45A software. Block 4 software efforts will increase computing and decision-making on-board the aircraft and expand the system’s ability to demonstrate operations in increasingly dynamic environments.

Block 4 demonstrations will have the X-45A vehicles continue to expand the operations envelope and function more autonomously by "hunting" for enemy threats and charting their own course to avoid the threats while moving into position to attack them. The aircraft will also demonstrate initial cooperative engagement functionality by deciding which vehicle has the optimal position to evaluate or to take action against a target.

The J-UCAS program is developing an integrated system incorporating multiple unmanned combat air vehicle platforms and a Common Operating System that are seamlessly linked to achieve shared, interactive control of worldwide operations. The software used and tested on the X-45A may be offered as a candidate for functionality in the development of the Common Operating System.

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The J-UCAS program is a joint Defense Advanced Research Projects Agency/U.S. Air Force/U.S. Navy effort to demonstrate the technical feasibility, military utility, and the operational value of a networked system of high-performance, weaponized, unmanned air vehicles to effectively and affordably execute combat missions. The J-UCAS Common Operating System will allow unmanned aircraft systems to intra-operate with each other and with the Global Information Grid. The J-UCAS system-of-systems concept plans to demonstrate the military utility and the operational value of airpower in the 21st century combat environment. More information on the J-UCAS program can be found at <http://www.darpa.mil/j-ucas>.

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