News Release

Defense Advanced Research Projects Agency

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X-45A J-UCAS BEGINS BLOCK 2 FLIGHT DEMONSTRATIONS

The Joint Unmanned Combat Air Systems (J-UCAS) program has begun flight testing the two Boeing X-45A aircraft with the system's newest (Block 2) software. Block 2 will demonstrate key aspects of the J-UCAS – multiple air vehicles conducting cooperative and coordinated operations with the capability to deliver weapons in a dynamic environment.

X-45A Air Vehicle 1 completed its first flight with the new software on November 4, 2003, at the NASA Dryden Flight Research Center at Edwards Air Force Base, Calif. The second X-45A vehicle flew with the new software on November 13.

Block 2 is a major step in advancing system-level capabilities and maturing the concept of a versatile network of high performance unmanned aircraft cooperating to achieve mission objectives. Key capabilities to be demonstrated with this new block of software include: control of multiple vehicles by a single operator, transfer of control between operators over a satellite communications link, and the ability to dynamically update mission plans while in flight.

To date, the program has successfully completed 13 of 40 planned Block 2 demonstrations, on the ground, in simulation, and with flight tests. These events have explored operator decision-aiding, integration with external command and control assets, and the distributed control of multiple air vehicles (demonstrated in high-fidelity computer simulations). The program completed Block 1 flight demonstrations in February 2003.

As Block 2 flights continue, the J-UCAS program will demonstrate a number of new capabilities:

- **Internal Weapons Release:** The X-45A will release an inert small smart bomb at the Navy's China Lake test range. This will be the first time that a GPS-guided weapon has been released from an unmanned system, as well as the first time a weapon has been released from an internal weapons bay on an unmanned aircraft.
- **Automated Dynamic Mission Replanning:** The system will automatically create new mission routes in response to changes in its external environment. When a new (simulated) threat radar system is observed by the system, the mission control system will create a new flight path to "avoid detection." This will be the first time that a real-time dynamic mission planner is demonstrated by an unmanned aircraft.

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- **Multi-Vehicle Coordinated Flights:** Two X-45A air vehicles will fly in formation using offsets to the same mission plan. Aircraft state information will be shared between the aircraft using an inter-vehicle data link (Link-16). This capability has never before been demonstrated with unmanned or manned vehicles.
- **Multi-Vehicle Distributed Control:** An operator at NASA Dryden will control two X-45A aircraft as they follow a combat mission plan. The operator will hand-off control of the two aircraft in flight via satellite to another control system in Seattle, Wash. This will be another first.

The J-UCAS program is a joint DARPA/Air Force/Navy effort to demonstrate the technical feasibility, military utility, and operational value of a networked system of high performance, weaponized unmanned air vehicles to effectively and affordably prosecute 21st century combat missions. The program's current mission focus includes suppression of enemy air defenses, surveillance, and precision strike. The system is being developed to integrate into the emerging global command and control infrastructure. The Boeing X-45A and the Northrop Grumman X-47A are tools for demonstrating the initial technical feasibility of the J-UCAS concept. Boeing and Northrop Grumman are now developing the next generation of vehicles (the X-45C and X-47B, respectively) to demonstrate the military utility and operational value of the J-UCAS concept.

More information on the program is available at http://www.darpa.mil/j-ucas.

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