Lockheed Martin Demonstrates Airspace Deconfliction Of Multiple Unmanned Aerial Vehicles

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Lockheed Martin's Unmanned Aerial Vehicle Airspace Management System (UAMS) solved one of the more difficult challenges facing military services and their industry partners by successfully demonstrating the ability to deconflict groups of in-flight UAVs during a test near Pittsburgh, PA.

Sponsored by the Army's Aviation Applied Technology Directorate, a team lead by Lockheed Martin Advanced Technology Laboratories (ATL) developed UAMS as a battalion echelon system that deconflicts flight paths of multiple, small UAVs with limited on-board sensors, communications and processing resources. UAMS also uses its own on-board sensors to "see-and-avoid" obstacles and other aircraft.

"The successful use of UAMS on in-flight UAVs caps three years of program development," said David Van Brackle, ATL's UAMS project manager. "Our work will improve safety and mission success for future UAV systems and for the Warfighters who depend upon them."

UAMS uses a ground-based airspace manager and UAV-based intelligent software agents to distribute the problem of airspace management. The system separates deconfliction into three activities: maintaining situational awareness and common, relevant operating picture; detecting conflict; and modifying flights paths. UAMS performs these activities on a centralized server or distributes them to the UAVs for deconfliction. It can also use a combination of both techniques, dynamically shifting among the three performance approaches based on the situation, user-defined policies based on terrain, communications load, server load, and other factors.

UAMS also uses sensor input to detect and react to obstacles, giving the UAV a "see-and-avoid" capability, allowing the UAV to react quickly while UAMS deconflicts the new path with other UAVs.

UAMS works over a range of operational environments, from large rolling terrain to smaller urban airspaces.

For the program, ATL developed the distributed, vehicle-information-management technology, concept of operations, and systems engineering. Teammate SRI provided avoidance-planning algorithms, and teammate SkEyes provided key avoidance sensor capabilities, including forward-looking, conic, laser radar and acoustic sensors.

Headquartered in Bethesda, MD, Lockheed Martin is a global security company that employs about 140,000 people worldwide and is principally engaged in the research, design, development, manufacture, integration and sustainment of advanced technology systems, products and services. The corporation reported 2007 sales of $41.9 billion.

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