



News Release

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Autonomous Airdrop System Could Reduce Casualties, Aid Relief Operations

CAMBRIDGE, MA – The U.S. military conducted the first operational mission in Afghanistan in May with a system that allows it to drop supplies like food, water and ammunition from cargo planes far more accurately than it had done to date, potentially reducing troop casualties as well as giving the U.S. military another option for assisting with some humanitarian operations. The dramatic increase in accuracy for the 2,000 pound payload system is enabled by software developed by Draper Laboratory.



(photo credit): U.S. Army Natick Soldier Research, Development, and Engineering Center

The U.S. Army's Joint Precision Airdrop (JPADS) 2K system, which operates completely autonomously once dropped from a C-17 or C-130 aircraft, could lead the military to revamp its tactics for resupply by reducing the need for truck convoys that leave troops vulnerable to enemy fire.

U.S. and allied troops in Afghanistan receive roughly 75 percent of their supplies from trucks maneuvering along the Khyber Pass, where Taliban and Al-Qaeda attacks on ground vehicles and helicopters have resulted in high rates of casualties.

The military also needs the JPADS 2K system because harsh weather conditions in the winter months, as well as the mountainous terrain, have left the Pentagon without accurate options via ground or air to resupply troops in some locations in Afghanistan.

Those concerns led the US Army to begin a rapid development program in February 2010 for an improved precision airdrop capability that could avoid difficult ground terrain in order to accurately reach those troops. Draper responded by turning the capability around in less than a year for under \$1.5 million.

By landing supplies far closer to U.S. forces on the battlefield than was previously possible, the improved accuracy also vastly reduces the time that troops on the battlefield need to be exposed to potential enemy fire while recovering supplies. Draper demonstrated that the system could exceed the military's accuracy and obstacle avoidance goals while operating in terrain similar to that of Afghanistan during testing at Yuma Proving Ground during the past year.

The Army recently deployed an initial increment of JPADS 2K systems utilizing the Draper software to Afghanistan for use in Operational Enduring Freedom, and is currently developing plans to convert future deployed systems to Draper's software. Results for all systems exceeded the Army's goals during the first operational mission in May. The work is sponsored by the Army's PM Force Sustainment Systems as well as the Airdrop Technology Team at the Natick Soldier Research, Development and Engineering Center in Massachusetts.

The Draper-developed JPADS guidance, navigation and control software is non-proprietary, owned by the government, and applicable to a wide variety of hardware platforms, so it could be used in other missions like relief efforts. One potential example of humanitarian resupply in which high accuracy is required is if the U.S. government is delivering supplies to civilians and needs to ensure that the provisions do not fall into enemy hands.

Draper has successfully flown the software on platforms manufactured by several vendors with payload capacity ranging from five pounds, which could handle medical supplies, blood packets, or sensors, to 42,000 pounds, which could handle a truck or armored vehicle.

Draper Laboratory

Draper Laboratory is a not-for-profit, engineering research and development organization dedicated to solving critical national problems in national security, space systems, biomedical systems, and energy. Core capabilities include guidance, navigation and control; miniature low power systems; highly reliable complex systems; information and decision systems; autonomous systems; biomedical and chemical systems; and secure networks and communications.

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