Marines Want iPads to Control Robo-Copter Brains

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It’s been less than a month since the Marines flew their first robotic supply helicopter on its debut combat mission in Afghanistan. Already, the amphibious combat branch is working on the next generation of pilotless cargo copter — one that’s an order of magnitude more sophisticated, and can be controlled by an iPad or other tablet.

The Navy, on behalf of the Marines, launched the so-called Autonomous Aerial Cargo Utility System program late last year. According to program documents, the goal of the six-year-program is to produce an “unmanned and potentially optionally-manned” robot to “provide affordable and reliable rapid response cargo delivery to distributed small units in demanding, austere locations and environments.”

Robotic supply vehicles, including the Marines’ remote-controlled K-MAX (pictured) plus driver-less Army cargo trucks and even autonomous forklifts, are one subject of my new book *From A to B*, just out from Potomac Books.

But AACUS, pronounced “ache-us,” isn’t meant to be just one robot design. Rather, it’s the *brains* of many models of robot. The idea is to produce a set of sensors, software, computers and controls that can be installed aboard almost any Vertical-Take-Off-and-Landing aircraft, including helicopters and potentially tiltrotors or even ducted-fan vehicles. “We want to show that we can plug-and-play across different rotorcraft and VTOL aircraft and get some level of guaranteed performance,” Missy Cummings, the program director, tells Danger Room.

Cummings is the perfect leader for the program. A former Navy F/A-18 jet fighter pilot, Cummings went on to design robots for MIT. For several years, she focused on building Unmanned Aerial Vehicles that required only minimal input from an unskilled operator using an iPhone or similar device. “Our philosophy is that humans have important jobs they need to do, and should not worry about low-level

housekeeping, telling a UAV to go from point to point," she told Danger Room two years ago. "UAVs are smart, and can do that on their own these days."

If the project works out as planned, the AACUS supply robots will fly between combat outposts with no direct human control, scanning their surroundings, detecting obstacles and enemies and even zooming in for quick deliveries after spending only seconds mapping out a landing zone using lasers, radar or other sensors. The 'bots will only need people to tell them when and where to deliver something, by tapping out a few commands on a smart tablet.

The program takes an incremental approach to developing the hardware. The first step is to select two contractors to build early prototypes, matching Cummings' technology with existing airframes. Lockheed Martin, a backer of the Marines' current K-MAX robot copter, is a likely bidder. So are Boeing and Northrop Grumman, developers of the A160 and Fire Scout unmanned helicopters, respectively.

The best two bidders will compete in an increasingly realistic set of tests starting in 2014, swapping the AACUS brains across multiple airframes. By 2018, Cummings wants to pick a winner — and start building production models for combat use.

Initially, the AACUS 'bots will handle supply runs in environments too dangerous for human pilots. Later, the pilotless copters could handle medevac missions, too. Cummings asks people to imagine a furious battle in difficult terrain. "Your buddy took a bullet to the chest and no manned helicopter is crazy enough to land." A Marine whips out a handheld device, taps a button or two and, within minutes, a medical robot is hovering overhead.

There are applications in the civilian world, too, Cummings says. "You could use it in Alaska" or other remote places with bad weather and rough terrain.

Cummings admits that it's an ambitious vision. "There's no guarantee we'll be able to make this work," she says. But even a near-miss could result in much-improved robots for a range of missions. "We are going to make substantial improvements."

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