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Extra UAV sensors boost surveillance capabilities

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The U.S. Army will use a General Atomics' MQ-1C Gray Eagle unmanned aerial vehicle (UAV) this spring to flight-test a new system of multiple sensors that can be controlled by ground troops or aircraft crews.

Called Triclops, the system adds a sensor under each wing to the fuselage sensor carried by UAVs. If Triclops works as well in flight as in the laboratory, the Army will deploy it to Afghanistan as soon as December so combat forces can test it in operations, says Tim Owings, Army deputy project manager for unmanned aircraft systems (UAS).

"It gives us the ability to increase the efficiency of the deployment of our systems by making a single air vehicle able to serve multiple users," Owings says.

A key element of Triclops is new bidirectional data-link software, developed by Kutta Tech of Phoenix, that permits troops or manned aircraft crews equipped with a modified One System Remote Video Terminal (OSRVT) to control one of the sensors and its electro-optical/infrared camera and laser designator/rangefinder while an automated control flies the UAV. Current OSRVTs are receive-only systems, allowing users to see a UAV's video but not control the sensor. The bidirectional video terminal (BDRVT) requires a special cable and antenna and incorporates a graphic user interface that lets users direct a sensor's camera to a point of interest with a touch screen and stylus. A platoon leader on the ground or aircraft crewmember will only control one ball at a time, but the UAV's operator will be able to control all three at once from a ground station.

Triclops will enable a soldier or aircrew with a BDRVT to control a sensor by activating a touchscreen command and moving the sensor wherever it's needed, Owings says. "If

you're looking at an [improvised explosive device] emplacement and have individuals fleeing in opposite directions, you could continue to track those individuals. Or if you're over a particularly hot battlefield situation and want to view multiple stare points, you have that option."

The additional sensors will be mounted on mid-wing hardpoints. The test version of Triclops will use Raytheon's AN/AAS-53 Common Sensor Payload on the MQ-1C, a UAV the Army has been using in limited numbers in Iraq and Afghanistan. "Longer-term, we will probably end up going with a lower-cost sensor, if we build this [system] in large numbers," Owings says.

If Triclops proves to be effective in Afghanistan, the plan is to install the system on three of the Army's UAVs—the MQ-1C, the medium-altitude MQ-5B Hunter from Northrop Grumman, and the RQ-7B Shadow, a catapult-launched platform from AAI Corp. Although the Gray Eagle flies at 15,000-20,000 ft., Hunter flies at 8,000-10,000 ft., and Shadow at 6,000-8,000 ft., their sensors produce full motion video of roughly equal quality, according to Owings.

The initial Triclops flight tests will be conducted at General Atomics' El Mirage flight operations facility in Adelanto, Calif., and at Dugway Proving Ground, Utah. Before sending Triclops to Afghanistan, the Army will include it in its Manned/Unmanned System Integration Capability (Music) exercise at Dugway in September, where crews will demonstrate manned/unmanned operations using an AH-64D Apache Block III attack helicopter controlling a Gray Eagle UAV.

Music will include a demonstration of the service's new Universal Ground Control Station (UGCS), from which the same operators can control the Shadow, Hunter and Gray Eagle UAVs. The Army plans to field UGCS in 2012 and make it the standard control station for all of its UAVs by 2016. The troops who are taking part in the Music exercise are also slated to demonstrate a smaller, handheld version of the UGCS that is

designed to fly multiple small UAVs.

The UAS project office was able to get Triclops ready for flight-testing in near-record time—barely a year—in part because the contractors spent their own money on it.

"We started last spring," Owings says. "It was something that we literally drew on a barroom napkin and said, 'If we did this, it could be a game-changing type of technology.' Two weeks later, we were in the lab prototyping it." ■



Initial flight tests of a reconfigured UAV take place this spring in California and Utah.



The Triclops flight test will use Raytheon's AN/AAS-53 Common Sensor Payload as the underwing sensors.