Boeing photo by Ed Turner

USAF photo by Sara Vidoni

Gadgets Every Gunship

The AC-130J needs new eyes and new weapons to kill its enemies and bring airmen home again.

USAF photo by SrA. Christopher Callaway

Lt. Gen. Bradley Heithold, Air Force Special Operations Command boss, wants a drone that can fly under weather to gather target coordinates and transmit them back to his gunships.

Air Force Special Operations Command's AC-130 gunships are facing increasingly challenging threats while enemies exploit its inability to see through clouds to operate freely in foul weather. "You've got to put the airplane over the objective" and safely ingress and egress, noted AFSOC Commander Lt. Gen. Bradley A. Heithold at the Air Force Association's Air & Space Conference in September.

Given the proliferation of man-portable air defense systems on the battlefield today, "the world in which we can do that continues to shrink," he added. In current operations against ISIS, "my AC-130 gunships are flying every single night delivering violence to my customer," except when weather hampers their ability to see the target, Heithold said. "The enemy is maneuvering, massing against an objective, oftentimes because of the cover of weather, and we need to take that away."

AFSOC is rapidly pursuing two hi-tech solutions: a high-energy laser weapon to counter surface-to-air threats and tactical offboard sensing to peel back the clouds and make the next gunship an all-weather battleplane. "Those two things I think are ripe right now; the technology is mature enough" to pursue in a very serious way, Heithold said.

GETTING SERIOUS

"I've challenged my folks [to] get a high-energy laser on an AC-130J by the close of the decade," he said, adding that he believes "we can do it." A legacy AC-130W Stinger II airframe is already earmarked to become a laser test bed and AFSOC has begun sketching out performance requirements and operating concepts. "I have to show that I'm serious about pursuit of this high-energy laser," Heithold pointed out. "When I said this is my 'close-of-decade thing,' we're showing in a serious way that we want to pursue this."

The Air Force's Advanced Tactical Laser program several years ago matured directed energy weapon technology to the point where it's both feasible and practical. "We learned a lot from the Advanced Tactical Laser. . . . That took the whole back of a C-130, but it did, in fact,

Lockheed Martin photo

Needs

By Aaron M. U. Church, Associate Editor

work," Heithold noted. "To me, the hard part of this will be directing the beam" to destroy incoming weapons before they hit the aircraft. The laser will need to be able to track a missile-size object flying at supersonic speeds and disable its seeker—from a moving platform.

Ground based systems are already capable of taking out incoming mortars before they impact a friendly base. "Now you've got to put it [on] an aircraft," Heithold said, explaining the challenge. He said industry is confident they can overcome the technical hurdles to keep the gunship a viable, potent weapons platform.

Unlike the 12,000-pound ATL, the new laser weapon won't have the whole back end of a C-130 to itself. The weapon must weigh less than 5,000 pounds and fit within the space allocated to the gunships' 30 mm or 105 mm gun. "I don't want to have to take a gun off the airplane, but I'll give [industry] that much space," said Heithold.

AFSOC foresees a secondary offensive role for the weapon against specialized targets where sneaky destruction is useful, such as disabling vehicles before a snatch-raid. Burning a hole through an aircraft wing or boat engine is sufficient to render it useless.

"You set the trap and then disable the escape mechanisms, … nobody hears or sees anything" until they attempt to escape. AFSOC is already studying how to use the weapon effectively against hardened targets but "not, I repeat, *not*, against humans," emphasized Heithold. A laser weapon would give the AC-130J an almost endless magazine of shots, its ample fuel load allowing the generation of electricity to power the weapon as long as it's aloft.

The solution to denying the enemy cover of weather is elaborate but "not that daunting a challenge" technologically, Heithold said. "What we want to do is take the sensor off of the gunship and drop it out of the back."

FLYING A COYOTE

The idea is to push a small remotely piloted aircraft out of the common launch tube, normally used to deploy precision guided weapons such as the Griffin missile. The RPA would parachute to a predesignated altitude before deploying its wings and setting up an orbit under the cloud deck. It would then feed live imagery back to the AC-130, giving the crew a real-time view of the target. A joystick aboard the gunship would allow an operator to steer the sensor, but the RPA would fly itself until it was no longer needed, and then crash.

"Whatever the sensor's looking at, I'm sending coordinates back. Once I've got the coordinates, it directly feeds it into my fire-control system" and the gunship can fire at the target coordinates, Heithold said.

L-r: The Advanced Tactical Laser, mounted on a C-130 test bed, flies over the New Mexico desert; a new AC-130J Ghostrider readies for takeoff at Eglin AFB, Fla.; a laser weapon damages a truck to demonstrate its effectiveness against ground targets. AFSOC is serious about getting a high-energy laser on an AC-130J by the end of the decade.

Although AC-130s can launch Small Diameter Bombs or even fire a 105 mm round at a set of coordinates today, the crew can't see if they've hit the target or by how far they've missed. With the RPA, "once I know where the round hit I can adjust fire" to destroy the target and also avoid inadvertently shooting something else.

AFSOC is already flying an internal proof-of-concept using the electrically powered, three-foot-long, 14-pound Coyote RPA, controlled from a laptop computer aboard the aircraft, Heithold said. Air Force Materiel Command is conducting a longer-term feasibility study evaluating all available RPA platforms, or even development of a new one.

Heithold said he wouldn't be surprised if the AC-130J goes to war with a derivative of the original laptop-controlled Coyote concept, though. "As innovative as our command is, [that] might be the one we take to the battlefield," he said, recalling the gunships' own legacy. "We took [the gunship] to the battlefield in Vietnam as a proof of principle and it never came home." That hastily deployed concept spawned a new kind of aerial weapon that has fought in every major engagement since. ✪