



USAF photo

Electronic Warfare Meets Austerity

The Air Force has abandoned big centerpiece programs and will go with modest enhancements.

By John A. Tirpak, Executive Editor

The Air Force's electronic warfare force, identified for years with traditional conventional military operations, is under pressure to alter its ways. Once focused on centerpiece aircraft and big-war concepts, the Air Force is planning on a smaller scale. Collapse of EW budgets, combined with high-level Pentagon emphasis on irregular warfare, is reshaping USAF's electronic warfare capabilities.

The Air Force now will contribute mainly a number of embedded elements to the overall EW picture. It will rely on its stealth capabilities, the Compass

USAF photo



An F-16C Block 52 aircraft equipped with Miniature Air Launched Decoys (in red) joins an exercise over Nellis AFB, Nev.

Left: An F-16CJ bristling with missiles (and an ALQ-131 ECM pod) turns hard over the mountains of Tennessee during a training mission.

Call jammer aircraft, pod systems, and decoys, all the while depending on the other American services for crucial support.

“We’ve got to get out of our comfort zone,” said Maj. Gen. David J. Scott, head of Air Force operational capability requirements.

In an October speech to the Association of Old Crows—an electronic warfare group in the Washington, D.C., area—Scott said the Air Force knows how to execute so-called major combat operations, and tends to see most challenges through that lens. In the past, that has usually meant big platforms with big budgets.

However, USAF must now find ways to add EW capabilities at low cost, “institutionalizing” irregular warfare, and better coordinating with its sister services, he asserted.

“We’re going to need to ... sit down and say, ‘Here are the things we really need to do ... with less money.’”

Toward that end, the Air Force in fall 2009 asked industry to offer ideas on a new EW pod that could be carried by A-10s and F-16s, as well as some unmanned aircraft, that would be effective against the kinds of low-tech, asymmetric threats that US forces are encountering in Afghanistan and Iraq.

“We know how to [defeat] the SA-20” air defense system, which is among the most sophisticated in the world, Scott said, but in many ways, it’s tougher to neutralize low-tech systems.

“The difference in cost ... is significant” between Air Force systems and what unsophisticated adversaries use to “cause us problems.”

He said that the Chief of Staff, Gen. Norton A. Schwartz, has instructed his budget programmers to consider what costs new systems will impose on adversaries rather than simply designing better widgets.

The new pods would not only provide a new jamming capability—chiefly against satellite phones and other local forms of communication—but could save the Air Force from having to build an aircraft, like the MC-12 Liberty Project Aircraft, dedicated to the mission, Scott said in a November interview.

Such an approach hews to the service’s philosophy that it must seek



USAF Maj. Jamy Sirmans (l) instructs US Army soldiers on the use of a new jammer system designed to cut in half the number of remote-controlled IED attacks in theater.

USAF photo by TSgt. Lionel Castellano

multiple capabilities for all its systems, and not simply dedicate a single system to every requirement.

“Our intent is to try to see if there are any solutions that are readily adaptable in a shorter term,” said Col. Stephen Brown, Scott’s EW division chief.

Existing pods, he said, are oriented against the threats encountered in major theater wars. The new pods, ideally, would be based on systems already available off-the-shelf or adaptable from another system, that would work in a different part of the electromagnetic spectrum. The Air Force would like to field them by 2012.

A One-to-One Dwell

Using a pod would also give Air Force units greater flexibility, since the aircraft would be able to perform strike or intelligence-surveillance-reconnaissance missions.

“They’ll still be able to do that, on a different day, or on the same day, if called upon,” Brown said.

Moreover, the pods would relieve some of the demand being placed on the Air Force’s EC-130H Compass Call aircraft, which jam enemy communications and can also disrupt the triggering of roadside bombs.

USAF’s 14 Compass Call aircraft have been deployed almost nonstop for 18 years. Some haven’t even come home once since the wars in Afghanistan and Iraq began eight years ago, Scott noted.

“It’s been pretty tough” on the men and women involved with Compass Call, he said, adding that most are on “at least a one-to-one dwell,” meaning

they are deployed at least as long as the time they spend at home station.

Like all pre-C-130J variants, the Compass Call is a hard-used and old platform. The Air Force is conducting a fleet viability review to assess how much life the airframes have left in them, to help decide how much the aircraft can economically be upgraded with new capabilities.

The EC-130s are slated to receive a number of upgrades when they go in for programmed depot maintenance over the next few years. Brown said enhancements will be substantial. “We stand by this platform,” he said. “It’s one of our flagships; it’s DOD’s most capable [communications] jammer.”

The Compass Call is not just for irregular warfare missions; it is also the Air Force’s premier communications jammer in major combat operations.

The Air Force is not abandoning the ability to fight MCOs, Scott maintained.

“The United States Air Force believes we need a stand-in capability,” he told the Old Crows audience. “We believe that we need to get into a place, ... fight in that place, kill things in that place, and get out.”

Stealth features, he added, do not do that “completely,” and EW support will be needed.

Scott hastened to add that his words are not meant to suggest that there is something amiss with stealth systems. It is just that, as technology advances and the nation’s military foes develop increasingly sophisticated countermeasures to stealth, it would pay to give the adversary multiple problems to solve.



A Navy EA-18G Growler maneuvers for a sea landing aboard the Nimitz-class carrier USS Ronald Reagan.

The loss of an F-117 in Kosovo was reason enough to add insurance in this way, he said.

The sister services will provide a significant part of the needed support, Scott said.

He pointed out that he and a Navy admiral co-chair the Joint Air Dominance Organization. Its purpose is to gather representatives of all the services to listen to what the others are pursuing in the air-to-air and air-to-ground domains, and then work together to avoid duplicating capabilities or creating conflicts—that is, to avoid “jamming ourselves.”

The objective is to obtain “coherency and complementary pieces,” Scott said. “We’re parallel.”

In this decade, the Air Force twice decided to focus its effort on a big EW centerpiece—a B-52 bomber fitted with a large standoff jammer. Twice, it has abandoned that plan.

Both times, the problem was that the project’s requirements outstripped the available funds. As budgets seized up, Air Force officials were forced to seek a different way.

“I don’t think we’re bringing back the B-52,” Scott told the Old Crows.

For the standoff jamming function, the Air Force will continue to depend on the Navy, which is in the process of transitioning from its EA-6B Prowler jammers to EA-18G Growlers. The latter is a variant of the carrier-based F/A-18 Super Hornet strike fighter.

The Air Force has no dedicated escort jammers of its own; compelled to pare back its fighter forces in the 1990s, it eliminated its two main penetrating

electronic warfare platforms, the EF-111 Raven and the F-4G Wild Weasel.

A Service Exchange Program

The EF-111 had a capability very much like the Navy’s Prowler. In fact, those two aircraft used variants of the same jammer for escorting strike aircraft into enemy territory. The Air Force justified the retirement of the EF-111 in expectation that, by now, most of the fighter force would be stealthy. However, it is not.

“We don’t have the money to maintain a redundancy in these platforms,” Scott told the Old Crows. “The EA-18 and EA-6 are both great platforms, and the EA-6 is going to be around a while.”

Since the EF-111 and F-4G retired, the Air Force has sent exchange officers to the Navy to fly on the Prowler. The exchange proved highly useful to both services, Scott said, as there was a sharing of tactics and techniques, and both services had an intimate knowledge of how the other prosecuted airborne electronic attack.

Scott said he’d like to see a continuation of this two-service arrangement. He recognizes, though, that the Navy will at some point give up 120 four-seat EA-6s for only 90 two-seat EA-18Gs, meaning there would be fewer seats available for USAF electronic warfare officers.

“We would like to be jointly tied at the hip,” Scott said. “If we don’t get on the Growler, we may lose some of that [joint-mindedness]. ... We don’t want to lose the experience and the knowledge.”

It would not be feasible for the Air Force to buy EA-18Gs, Scott added. “It would be a small number, and we cannot maintain that kind of fleet.”

In major combat operations, Scott said, the Growlers will “blow a hole” in the outer ring of enemy integrated air defense systems. From outside the enemy IADS, F-16s, B-52s, and possibly other legacy-type aircraft will shoot swarms of Miniature Air Launched Decoys, or MALDs, into enemy territory.

Plans call for the assault of 250-pound MALDs to confuse enemy radars, which will not be able to tell the difference between full-size aircraft and the expendable missiles. A variant, the MALD-J



Crew chief SSgt. Alex Rosales readies an EC-130H Compass Call aircraft for launch at Bagram Airfield, Afghanistan.



Defense planners hope that 250-pound Miniature Air Launched Decoys (MALD), such as the one shown here in an artist's conception, will confuse enemy radar.

(for jammer), will also fly in to jam enemy radars at close range.

Meanwhile, Joint Air-to-Surface Standoff Missiles, or JASSMs, and other stealthy cruise missiles would also enter enemy territory to destroy air defenses or other high-value command and control targets.

Stealthy F-22 and F-35 fighters and B-2 bombers, by virtue of their low observability and onboard electronic countermeasures, will be able to fly through enemy airspace undetected, and help destroy enemy defenses, creating corridors for nonstealthy older fighters such as the F-15, F-16, and A-10 to come through.

They, too, will have a self-protection capability, in the form of updated versions of the ALQ-119 and ALQ-131 jamming pods.

Scott said the Air Force is “brainstorming” an armed version of the MALD, one whose warhead could destroy an enemy radar instead of simply jamming or confusing it.

“If they’re not coming back, and they’re going to land somewhere, and they do have a guidance system, then why not put a weapon in it?” When the strike force is departing, “and it’s there, and it’s done its job, can it hit a target?” Scott said the idea may bear fruit in “two or three years.”

The Air Force is also looking at the inherent capabilities of the F-22 and F-35, with their active electronically scanned array (AESA) radars for radar-killing or jamming functions. It’s not easy, Scott said, since any emission by an aircraft reveals its presence.

He allowed that the Air Force is also thinking hard about the role that unmanned aircraft will have in a future electronic attack concept of operations.

“We are looking at ... [an] MQ-X,” he said, which would add stealthiness to the attributes of an unmanned aircraft in the class of the MQ-9 Reaper or MQ-1 Predator.

Learning From the Enemy

“We haven’t defined that yet,” he said, because the service is also rethinking some of its concepts and terminology. The terms “stand-in” and “standoff” jammer may become obsolete because such categories may not apply in a future battlefield.

As Scott put it, it might be worthwhile to think of “permissive, ... contested, [and] ... highly contested” airspace to describe the environment in which the systems will operate. Air Force Materiel Command chief Gen. Donald J. Hoffman has proposed such a different nomenclature.

It’s also likely that the MQ-X would have to have internal jamming capabilities, because hanging a pod on the aircraft would detract from its stealthiness.

The Army has a role to play in the EW discussion, Scott said, because it conducts its own jamming function and wants to make it a bigger part of what its own unmanned aircraft do, the better to defeat buried roadside bombs.

With the broadened service involvement, some call for establishing an executive agent for EW and airborne electronic attack (AEA). Such status, conferred on a single service, gives that

branch authority to direct the related activities of its sister services. Scott, however, opposes that move.

“This mutual organization that we’ve got” is sufficient to keep the services coordinating on AEA and EW, Scott said, and it’s working “coherently.”

It’s not like space, he said, where the Air Force was executive agent. The domain is not as “huge” and neither are the budgets, he said.

“What you’re going to have to do is cover the spectrum together, and do it in a manner that saves the taxpayers money,” Scott said.

Despite the concerns over funds, Scott said the AEA and EW field is reasonably well-funded into the future. Schwartz has taken a personal interest in seeing a rational and effective electronic warfare capability, and in the Fiscal 2011 program objective memorandum, USAF took significant steps.

“We’re very interested in helping out the EC-130,” said Scott. “We’re very interested in the capabilities of fifth generation radars, very interested in the capability of pods that enable us against the adversary threats that are out there.”

Scott said USAF may also apply some of the adversary’s tricks. “We can learn some things from them, too,” he said.

Asked to look ahead and pinpoint electronic warfare’s toughest nut to crack, Brown warned about what some have begun to call “hybridized” air defenses. These feature applications of new, powerful, and inexpensive electronics to update older air defense systems.

“A lot of commercial, off-the-shelf technology generates very quickly,” Brown said. “It’s just a very quick cycle of development to keep up with.”

Scott, asked the same question, said, “It’s everything. ... It’s across the entire spectrum of operations.”

Brown said the Air Force is laboring on an electronic warfare roadmap—one of several this decade—which will “break up our problem and look at near-term, midterm, and long-term approaches.” It won’t look simply at hardware, but “across doctrine, organization, training.”

The Air Force should not have a major command focused on EW, Scott said, because the entirety of the electromagnetic spectrum is used by the entire service; it is not limited to an easily segregated mission area.

“We have ... a system of systems,” Scott said. “That’s what it is, a family of systems. It’s not just AEA, it’s aircraft that have AEA embedded in them.” ■