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Attack On Bombs

U.S. Air Force program weaves surveillance and intelligence to find roots of IED attacks in Iraq

By David A. Fulghum, Washington

The U.S. Air Force is reexamining the way airpower has been applied to the war against insurgents in Iraq, in particular the battle against hidden bombs and suicide bombers.

Planners are abandoning the narrow search for single technology solutions to finding and disabling improvised explosive devices (IEDs) and have begun searching for a broader approach that will target enemy planners, organizers, suppliers and bomb makers in their homes and workshops, well before attacks can be put into play.

In planning for more than a year, the Air Force last month launched an effort to fuse intelligence around the basic building block of ground moving-target indicator (GMTI) data gathered by aircraft. While some fighters, bombers and unmanned aircraft carry sensors with moving-target detection capability, the primary source of such data is USAF's E-8 Joint Stars long-range radar surveillance aircraft (AW&ST May 16, p. 64).

In early May, U.S. Central Command began to operate this new fusion system that pulls data from both the battlefield as well as the archives of intelligence organizations to combat the insurgency and terrorist organizations.

There's already a 5-min. film clip circulating at the Pentagon that shows some promising initial results.

"I've seen footage of [imagery from Joint Stars] watching insurgents setting a bomb, and then being able to determine where they came from and where they went," confirms a senior Air Force official. In particular, "the Joint Stars have been looking at [segments of Iraq] night after night to see the vehicles--where they come from and where they go. They do it over and over and then begin to see where the bombs are made and where people meet before and after a bombing." Once the patterns of movement are understood, U.S. and coalition forces could then attack the locations where the bombers live or work. Or the traffic could be further analyzed and backtracked to reveal even

wider insurgent networks.

There are of course critics. "It sounds neat, but it's not," says an industry skeptic. He asserts that results are preliminary and still need a lot of work to determine how to cleanly and quickly draw conclusions from the fusion system.

But most agree on one basic premise. Both military and industry officials have concluded that trying to find all the hidden bombs or intercept the suicide cars one by one is a defensive measure that offers no long-term solution.

Military users say most detection systems employed in Iraq have flaws that limit effectiveness when used alone. The Army's Horned Owl aircraft carries high-resolution synthetic aperture radar and other sensors. However, it collects so much data it creates many false positives that have to be authenticated (AW&ST May 9, p. 20).

Coherent change detection also has promise, but used alone is misleading. The problem is the amount of trash that blows around Iraq. Tests run in Arizona, which has a much cleaner environment, found IEDs most of the time. But high winds in Iraq produce false targets every few hours that trigger change detection sensors. The Army, under immense pressure to find a solution, and the Air Force are now turning to an architectural perspective that combine such outputs to isolate useful information.

About a year and a half ago, the Pentagon asked the aerospace industry to look at the IED problem and since then the effort has evolved from a search for silver bullet remedies to a holistic approach.

The radar data is routed from the Joint Stars aircraft through a variety of downlinks to ground sites, including the theater's air operations center, where analytical tools are used to manipulate and filter the raw data and provide first-order analyses. That information is then handed to combatant units for military action or transmitted to other intelligence agencies, both in theater and in the U.S., for further processing. The product is a multi-layer analytical process that can provide both real-time knowledge to troops in the field and deeper long-term insights from in-depth forensics for a more complete intelligence picture. And, the response time for extracting usable intelligence is expected to drop to minutes and hours instead of days and weeks.

During the analytical process, the information is also fused with other types of intelligence to produce improved knowledge for the combat commander. The knowledge is also fed back into the mission requirements process for the assignment of future airborne surveillance or intelligence-gathering missions.

"We are able to cue on a convoy that is struck by or whose members see an exploding IED and they'll call the Joint Stars which immediately looks at that vicinity for any fleeing targets," says a veteran Air Force ISR specialist. "They are also watching the environment around the area of focus, and patch together earlier observations. The insurgents have an unlimited supply of guys willing to blow themselves up in a bomb-laden vehicle or throw a device out the window of a moving car. We have to interrupt the IED production process in its early stages and strike the infrastructure where it is most vulnerable."

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