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U.S. Army develops smaller, lighter equipment for Warfighter

Remote sensors, advanced interface report conditions during reconnaissance missions

ABERDEEN PROVING GROUND, Md. – Robert Pazda says his team within U.S. Army Edgewood Chemical Biological Center is accustomed to having to fit 10 pounds of equipment into a five-pound bag. But his team's latest project—the Global Strike Near Real Time Battle Data Assessment (NRT-BDA) System--could change all of that.

"The Army always wants everything smaller, lighter," said Pazda, the branch chief for Electronic Design Integration within the Advanced Design and Manufacturing Division of the Center's Engineering Directorate. His team focuses on the integration of many electronic parts that constitute state-of-the-art devices to keep the Warfighter safe.

The Global Strike NRT-BDA System incorporates a suite of unattended sensors and a remote Warfighter Interface to provide timely reporting of conditions around a target during reconnaissance operations.

One sensor includes a chemical agent detector that's shape and size is approximately that of a two-pound soda can. The sensors are intended to be air deployed and have been tested from a P-3 Orion aircraft at 1,000 feet. The sensor is equipped with an accelerometer, which triggers the release of the cap and small parachute (ballute). Once it lands, spring-loaded legs pop open allowing it to sit upright.

The detector is also equipped with a GPS tracking device. Once the detector has landed and the GPS position remains the same, the device initiates the start sequence of the detector, so that it can detect chemical agents and other threats, in addition to seismic activity.

This detector, which was a redesign of the Joint Chemical Agent Detector, can feed information to a satellite and then back down to Soldiers manning a Warfighter Interface as far as a few thousand miles away.

One of the earlier challenges with the Global Strike NRT-BDA was fitting all three different antennas onto a circuit board that was 2 ¼" in diameter. It contained a GPS antenna for location purposes, an iridium antenna which sends information up to a satellite, and a short range communications antenna.

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In a later design the short range communication antenna was no longer required. "It's a pre or post assessment tool," Pazda said. "You could drop it and know something is there and strike, or you know something's there and avoid the area."

The device has been a collaborative effort with many other organizations, which designed the sensors and other parts that the Electronic Design and Integration Branch incorporated into the device. They have worked with the ADM's Engineering Design and Analysis Branch, Johns Hopkins Applied Physics Lab, the Air Force Research Laboratory in Rome, NY., Naval Surface Warfare Center Dahlgren Division, as well as Kansas State University and Smith's Detection.

There are still challenges to work out in terms of extended operational time. Currently, the device will last for four to six hours, but the goal is to have it monitor its surroundings for several days. The Global Strike NRT-BDA has displayed survivability with plans for improvement.

The biggest challenge Pazda said his team faces is the fast pace of changing technology.

"My world is challenging. We do so much with electronic wizardry, but people don't realize the tens of millions of dollars that were invested in things like cell phones that took decades to perfect what we have today. That's the challenge in this electronic age, to keep up with technology since things happen at a very quick pace," Pazda said.

He noted that the first transistor was invented in 1948, and the first integrated circuit was created in 1951. In 15 years, the world has gone from cell phones to smart phones with internet functionality, to cameras and applications that can do just about anything. With the increasing pace of advances in technology, there is a greater push to keep up with the latest generation of technological changes that go along with those advances.

"We have to investigate those products and integrate the newest capabilities to support the Warfighter," Pazda said.

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ECBC is the Army's principal research and development center for chemical and biological defense technology, engineering and field operations. ECBC has achieved major technological advances for the warfighter and for our national defense, with a long and distinguished history of providing the Armed Forces with quality systems and outstanding customer service. ECBC is a U.S. Army Research, Development and Engineering Command laboratory located at the Edgewood Area of Aberdeen Proving Ground, Maryland. For more information about the Edgewood Chemical Biological Center, please visit our website at http://www.ecbc.army.mil or call (410) 436-7118.

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