Fort Belvoir involved in development of military threat-detection device

By Steven Overly
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The screen on a detection device being developed by the U.S. Army at Fort Belvoir doesn't show much, just a blinking dot where something or someone on the opposite side of a wall is moving.

The soldier who could use it as soon as next year won't know if that dot poses a threat, or if it's even a person, but at least he'll now know something's there.

Troops fighting in urban battle environments where danger might lurk among the jungle of walls and corners have asked for technology that can detect objects through such structures since 2005, Lt. Col. Christopher Schneider, the Army's product manager for soldier maneuver sensors, wrote in an e-mail.

"The increase in situational awareness provided by STTW [sense through the wall] will enable the small unit leader to focus his combat power and reduce the likelihood of fratricide and noncombatant casualties," Schneider wrote.

But technological limitations and complex algorithms make detection technologies more challenging to build than Hollywood illusionists might have you believe. Two prototypes, each a bit larger than a brick and weighing three pounds, ultimately met Army performance standards and their makers were awarded contracts last week.

The two contractors will manufacture 30 samples each for further field-testing. El Segundo, Calif.-based Raytheon Space and Airborne Systems won a contract worth up to $88.8 million. The other contract, awarded to Orlando-based L-3 Communications CyTerra, has a maximum value of $62.1 million. One or both companies will then produce a total of 9,212 units as soon as next fall, a spokesman said.

"It's significant to get a contract awarded because that's your final stage at being at the point to deliver hardware to soldiers," said Daniel Kitts, the deputy project manager for soldier maneuver sensors. "That's what we're here for."

The handheld devices, which can run on AA batteries, use radar technology that emits electromagnetic waves to detect movement as subtle as someone breathing. The waves can travel 65 feet and penetrate 8-inch-thick adobe walls.

Researchers began to evaluate this type of technology in 2004 and the last six years have allowed them to build software sophisticated enough to sense the movement's direction and distance from the soldier. For example, the device could detect a combatant walking inside a building, even if the soldier is standing on the opposite side of the street, as long as they are no more than 65 feet apart.

The distance is key. Though holding the device against the wall itself would provide a more stable base, researchers said it may also put the soldier at greater risk. Thus they built the gadgets to counterbalance the user's own motion, such as swaying or a shaky hand.

"STTW sensors will enable Soldiers to quickly locate combatants in concealed structures, minimizing the enemy's advantage from using concealed or protected positions in urban areas," Schneider wrote. "By providing precise target information, STTW improves the small unit's ability to maneuver and engage targets while avoiding potentially hazardous areas."

But limitations persist. The blinking dot doesn't convey whether the object in motion is armed, if it's an adult, child or animal, or if it's several people standing close together. The radar also cannot penetrate metal or walls with a lot of piping, according to researchers.
Developers will continue to hone the software to overcome those obstacles, but the next round of testing calls for soldiers to use the devices during mock combat drills. They'll also be made more rugged to endure rough terrain and harsh weather.

"The process now is pretty straightforward," Kitts said.