PRINTER FRIENDLY...

« Go back

Please contact Kerrigan Media for a reprint of this article.

Special Operations Technology
ONLINE EDITION

No Hiding

With the face of warfare constantly changing, the tools that soldiers need to fight have to adapt with the threats they face. One of these emerging tools includes various technologies that see through walls, allowing soldiers to identify potential dangers they face before they enter a structure.

By Kenya McCullum

With the face of warfare constantly changing, the tools that soldiers need to fight have to adapt with the threats they face. One of these emerging tools includes various technologies that see through walls, allowing soldiers to identify potential dangers they face before they enter a structure. These technologies—which are being developed by both military agencies and private companies—are able to warn users about targets through either the use of sound or the use of images.

Sensing Through Sound

After the Bosnian conflict, soldiers reported that they were having difficulty detecting their targets because so many missiles were located under trees. Although Air Force pilots could tell there were objects between the leaves of trees, the radar technology they had at the time did not allow them to distinguish exactly what those objects were. Rules of engagement would not allow attack without confirmation of a target. This left pilots vulnerable to attacks, because the missiles they couldn't see could actually see them.

In order to remedy this problem, the High Powered Microwave Division of the Air Force Research Laboratory began developing the Target Identification Demonstration System—also known as

Ping—to help see through trees. The system uses microwaves that would look through foliage and send a ringing signal when it detected a target.

As warfare changed again with the Afghanistan and Iraq conflicts, the priority was no longer to look through trees but to be able to see through walls.

Unfortunately, after working on Ping for about six years on a small budget, the Air Force decided to put the project on hold in order to fund those with a higher priority. However, technical advisor Bill Prather said that the military is still interested in developing the technology, and he is confident that its funding will be reinstated and Ping will be picked up again.

Microwaves

Millennium Sensor, LLC, a Colorado-based company that has been making force protection systems since 2000 developed the P3 mobile remote sensing system (MRSS). Although the P3 was designed to provide sensor information to users, the company did not specifically create the device to see through walls—that function was discovered by customers on their own.

"What we found is that a lot of our customers who use these things have discovered that microwaves can also see through normal construction material—plywood, drywall and a little bit of brick, depending on how thick it is," said Mike Roberts, the company's CEO and chief technical officer. "It's just like any microwave system can look through general materials, these will do the same exact thing."

In order to do this, users place the P3 over or near a door to detect a target that is up to 500 meters away. When the sensor, which is about the size of a cell phone, detects a target, it sends a voice message to the user through a headset—a safety measure that allows them to stay alert and keep their hands free. The sensor is also utilized during tactical entries, in which they throw devices down in a building from room to room. When used in this manner, everyone involved in the mission would be connected to the same radio system, allowing simultaneous information reception about the location of targets.

While the P3 sensor is an effective tool to use in this way during tactical missions, Roberts noted that what makes it unique is that it is actually not connected to a network, giving the individual user an advantage that is more cost effective.

"The physics is what kills you. If you're going to have a radio connection through a network, you need power. The further you want that network to stretch, the more power you need and so that either means you've got to have bigger batteries or you've got to have connections to the grid of some kind," he said. "Today's warfare is not just going to always be network centered. There's going to be a lot of times when a small team of guys are going to be slogging around somewhere a long way from their network. They're going to be out there with their butts hanging out in the breeze. We are really working hard to keep expanding these little detachable systems so that once users go off the grid, the system goes with them."

While many of Millennium's customers are buying the P3 sensor to specifically look through walls, Roberts said that he does not necessarily encourage them to use the device in this way. There are so many variables—such as fiberglass installation within a wall—that can prevent users from seeing through a wall, Roberts suggests that users proceed with caution.

"There are so many things we can't control as a manufacturer, that we don't promote that application," he said. "I don't want to guarantee to someone that they're going to be able to see something and then put them at risk because they can't that one day. And that's going to be

true of every technology that could conceivably look through walls. Any kind of radiation system could be foiled by some very simple construction technique that is designed to prevent water from getting through—but it's also going to prevent microwaves."

Sensing Through Sight

In addition to alerting users of targets by using sounds, some see-through-walls systems actually display images to help users determine what is on the other side of a wall. For example, the Intelligence and Warfare Directorate (I2WD) of the Army is currently developing technology that will help soldiers see images on the other side of walls.

"This guarantees our warfighters the superior integrated systems they need," said Wilbur Chin, the manager of I2WD's suite of sense through the walls systems. "I2WD is about providing our soldiers with the tools they need for information dominance."

The sense-through-the-walls suite includes an extended-range device that can be mounted on a Humvee, as well as a handheld device. The long-range device, which can work in a range of over 100 meters, can scan a building from a distance, allowing soldiers to save time and bypass any structure that does not contain a target. If users do detect a target with the long-range system, they can use the handheld system, which has a range of greater than 20 meters, to determine exactly what is behind the wall—which will be represented by projecting dots or lines.

Options

Another see-through-walls system that produces images for the user to determine the location of a target is the Xaver, manufactured by Camero, Inc. The device, which is designed for use by both military personnel and civilian law enforcement, uses radio frequencies to penetrate walls. When a target is detected, radar bounces off of any reflective material on the other side of a wall and then returns shadowy images—with details such as arms, legs, and torsos—to a user at about five frames per second.

"You can perform an analysis of how many people are in a building, where they are, and to some degree, what they are doing," said Camero president Bob Judd. "You can tell, for instance, the difference between someone sitting down and someone standing up, and you can tell someone walking around versus lying down asleep. You can tell what they're doing and how many people there are."

Tread with Caution

Although see-through-walls technology is a useful tool in contemporary warfare, soldiers should remember that it is only one tool in their arsenal, and they should not become too dependent on it.

Mike Padilla, a trainer at Mi2 International, Inc., teaches users how to operate the Millennium Sensor, but stresses the importance of combining technology with human faculties.

"We like to teach them how to leverage technology, but not depend on it, so they keep their skill sets, and their situational awareness. We teach them how to use those two combined, and how to integrate those two together," he said. "You're not going to get away from technology, but technology cannot completely take over. People need to learn how to handle both sides of the spectrum—your human intelligence and capabilities, and leverage technology. That's the future warrior that people are looking for."