

SRC's Sense-Through-the-Wall obstruction penetration radar system, O-PEN radar, is poised to be a valuable technology to assist the U.S. Army in urban operations.

Redefining possible®



The *O-PEN* radar system combines through-the-wall human detection and location capabilities with mapping technology to provide a powerful, real-time tool for situational awareness.

Finding ground-breaking, timely solutions to grand challenges has been an objective for SRC, Inc., formerly Syracuse Research Corporation, engineers since the late 1950s. Keenly focused on our customers' needs, we develop solutions through the innovative application of science, technology and information. Working collaboratively with the U.S. Army, SRC's engineers have developed an exceptionally innovative surveillance solution primarily in support of military operations in urban terrain.

SRC's Sense-Through-the-Wall radar system, *O-PEN*™ radar, previously known as SOMISR II, was developed to address urban warfare requirements under a U.S. Army Technology Objective program. Increasing survivability of warfighters operating in challenging urban environments requires technology to break through the clutter that conceals potential dangers. Using a cost-effective spiral development approach, a dedicated team of SRC radar technology experts designed, built and tested vehicle-mounted systems and achieved a high probability of human detection.

The *O-PEN* radar system can operate in either stationary or moving mode, making it very flexible to meet the complexity of the urban terrain being explored. And while the initial application for the system is to provide soldiers with situational awareness before breaching a

building or while policing an area, the radar system may be applied to other missions including ground surveillance and foliage penetration.

SRC's *O-PEN* radar system can detect and locate people behind concrete walls, doors and other barriers from a significant standoff range. The ultimate goals are to maintain technical superiority and enhance situational awareness as the warfighter moves through an urban setting. In addition, the *O-PEN* radar system's advanced technology generates an image of the building that maps the walls of the building, for a clear tactical picture of the operation.

Technology Prowess

To date, several prototype systems were tested and demonstrated in relevant environments under various scenarios. The *O-PEN* radar system successfully detected single or multiple human targets whether walking or stationary (breathing) through various wall types, and in the presence of clutter. In addition, the system was able to map and create images of the exterior and interior walls of the structures being tested, in essence providing a virtual layout of the building.

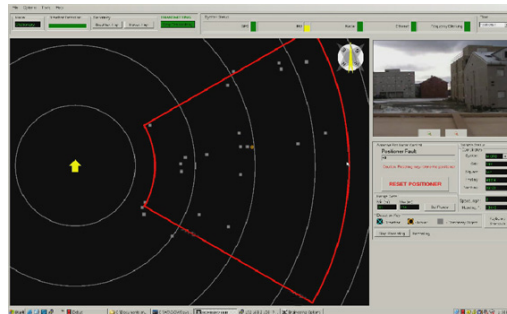
The two applications combine to provide a clear, real-time picture of the situation for operational decision-making. The *O-PEN* radar system operates remotely by wireless technology, allowing the warfighter to be at a safe distance from the structure and the radar vehicle to

explore and document the potential threats. The system is currently designed to a Technology Readiness Level 6.

Unique Features

What makes this system unique is the combination of technology and software. The *O-PEN* radar system includes:

- New multiple-input-multiple-output inspired ping-pong type transmitter to enhance the effective aperture
- Synthetic Aperture Radar algorithm that adapts for changing platform speeds and trajectories
- Moving target detection signal processor capable of integrating over long dwell times to detect stationary breathing targets
- Naval Research Laboratory deconvolution algorithm to improve range resolution while employing relatively little bandwidth
- High-speed, state-of-the-art multi-channel analog-to-digital converter



Detected breathing person inside a building.

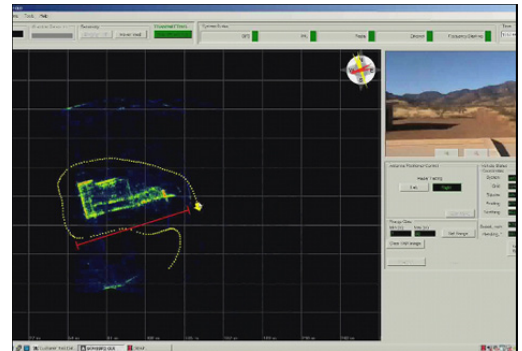


Image of building complex created by the O-PEN radar system during a drive-by at a desert site.

Next Steps

SRC is committed to helping protect warfighters through the innovative use of new and existing radar technologies. With the *O-PEN* radar system, SRC has pioneered the most powerful and advanced Sense-Through-the-Wall radar of its class. Our engineers are continuing to explore the radar system's potential not only for military operations in urban terrain applications, but for other military applications.

Our mission continues, and exploring the full potential of the *O-PEN* radar system is a top priority at SRC. We "see" the future of modern warfare, and the *O-PEN* radar system is poised to be a valuable technology asset for the U.S. Army to succeed in urban terrain.

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