STRAIGHT TALK

The Mini-SCC solves communication problems across a wide range of dissimilar radios

The Mini-SCC has elevated Warfighter communication capabilities in a variety of environments.

The Department of Defense had a communications problem. Two-way radios operating on different frequencies required a liaison to transfer messages from one person to another. Warfighters communicating with a handset on one network while listening through another radio on a different network needed to relay a given message manually between networks. Cumbersome and slow, it was a system that risked the possibility for human error.

"It's a little like the game we played as children—telephone—where you pass a message around to each person," said James O'Looney, Vice President of Integrated C4I Systems at Trident Systems Incorporated. "It is a speed problem and an accuracy problem."

In 2016, Trident Systems, a veteran-owned technology company based in Fairfax, Virginia, was awarded a Small Business Innovation Research (SBIR) contract to solve this problem. Extending radio communications technology developed for an Enhanced Image Capture and Transfer Capability System, the contract allowed for the development of a communications interoperability device which met the requirements of the United States Marine Corps. The resulting system, called the Mini-Secure Communications Controller, or Mini-SCC, allows Warfighters to communicate across a wide range of dissimilar radios, including commercial cell phones, legacy and modern military radios, public safety radios, push-to-talk and full duplex radios. Ordinarily these radios would be functioning on different frequencies, unable to supply direct communication to one another. But the Mini-SCC technology is able to take the audio from one communication device and automatically send it to another communication device.

At 6.28" x 4.15" x 1.55" and weighing just 37 ounces, it's a man-portable device that fits neatly into two open palms. As a tactical voice bridge, the Mini-SCC routes audio inputs to disparate radios in real time. Setup and configuration are done through a web-based interface, allowing an operator to access, configure and store settings in the Mini-SCC from any web browser. A user can tailor settings and save profiles that can be linked to the buttons on the front panel of the device.

Once settings are tailored, however, the user no longer needs the computer to reconfigure the device. For example, O'Looney said, you could configure Button 1 as "all networks communicate together" and then configure Button 2 as "one way audio from channel 1 to 2, with channel 3 and Handset communicating bi-directionally." Once you remove the computer, the Mini-SCC can be switched between profiles with the press of a button.

"The Mini-SCC runs completely independently, without accessing a software interface," he said. "In other words, if you turn it on, it'll run in the last way you set it up, without plugging in a computer. This is

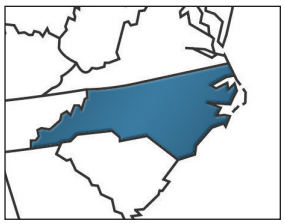
key, since it's a handheld device, and there may be scenarios where you need to pull it out of your rucksack and just make it work."

The Mini-SCC allows communication between a variety of tactical radios for U.S. Warfighters, but it also, importantly, helps US Warfighters communicate with foreign counterparts whose devices are otherwise incompatible with U.S. devices. The U.S Marine Corps and Japanese Ground Self Defense Forces use the device for their tactical radio communications, and the Mini-SCC's interoperability capabilities were recently tested with the U.S. Army and it's Republic of Korea (ROK) partners.

During the testing, tactical radios were located in Camp Humphreys, a U.S. Army garrison in South Korea, while land mobile radio (LMR) users were located in Seoul, Pyeongtaek, Daegu, and Busan. The army conducted a total of four tests in which Mini-SCC successfully cross-linked incompatible audio devices and proved that one radio type can rely on another to transmit voice communication. The success of the tests showed that the Mini-SCC would provide tactical radio coverage during convoy operations throughout the Korean Peninsula.

"We learned that we could pass traffic of one type of communication using the transport method of another communication," wrote MAJ Jooshin Park, Eighth Army G6, in the 2020-2021 issue of Premier Signal, a signal command publication. "This means it is possible to communicate from a SINCGARS Manpack in Camp Casey, Korea, to units down in Busan, Korea. It may even be possible to communicate with anyone in the world on any type of communication device."

Key to communicating between different and incompatible devices is the ability to do so without changing other parameters such as encryption and security. The Mini-SCC was developed to provide interoperability regardless of settings—meaning encrypted messages can be relayed and still remain secure.



"Mini-SCC allowed us to conduct secured and encrypted tactical radio communications while maintaining integrity of country-specific encryption types and settings," Park wrote in the article. "This device allows us to conduct secured communication without the use of shared coalition keys."

From the initial tests that aimed to increase interoperability between ROK and the U.S., the Mini-SCC has proven to be useful in a number of other settings as well. O'Looney said the technology allows for communications that can save lives in other obvious ways, such as with medical evacuation. In emergency situations where a Warfighter might be injured, a tactical radio would relay a message to a range network that then contacts the 911 call center. With Mini-SCC, communications with 911 call centers can happen directly.

"It removes the problem associated with multiple people in a loop all trying to relay one message," O'Looney said. "And it results in the accelerated release of a medevac vehicle."

In a domestic setting, the Mini-SCC can also be set up to include voice over internet protocol (VoIP) support, with an internal Private Branch Exchange (PBX), meaning that you can call to and from multiple external VoIP streams, set up conference rooms, and connect them to analog radio networks as well.

The Mini-SCC is just one device created from the SBIR-supported technology, which has a wide range of possible applications. This device has elevated Warfighter communication capabilities in both highly convenient and life-saving ways, but it needed the SBIR to come to full fruition.

"In our business, the SBIR program is of critical importance," O'Looney said. "It accelerates the DoD's access to novel technology, requiring only modest investment for development and evaluation. When a system is proven to have merit, the DoD can rapidly mature it for transition. This allows our Warfighters to benefit from new technologies at a much improved pace."

Modernization Priorities: Fully Networked Command, Control, and Communications (FNC3), Microelectronics
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National Defense Strategy Pillar: Force Readiness and Lethality