

JUST GOOD SENSE

SBIR-SUPPORTED DISPOSABLE SENSOR TECHNOLOGY INCREASES CAPABILITIES AND DECREASES WARFIGHTER RISK ACROSS SERVICE BRANCHES

In 2006, U.S. Army General David Petraeus issued a statement of need: the U.S. military, he said, required better sensors for its service members. In order to detect enemy personnel or infiltrators through seismic, acoustic, or thermal surveillance and infrared cameras, many units were using technology that dated back to the Vietnam War—devices that were cumbersome and relatively inefficient.

Just a few years earlier, the Army Research Lab (ARL) had posted a Small Business Innovation Research solicitation topic searching for a solution to the problem General Petraeus had identified. That call was answered by McQ Inc., a defense and electronics company based in Fredericksburg, Virginia, that specializes in sensor and surveillance technologies. According to John McQuiddy, founder of McQ, both service members and military leaders wanted sensors that were disposable, which would preclude

the need to retrieve them from potentially dangerous areas.

“Soldiers wanted to throw them out, not go back to the front lines and get them,” McQuiddy said.

McQ had a working sensor solution. Called OmniSense®, the technology was the size of a shoebox and contained a satellite link that took advantage of multiple

sensors in one package, including seismic, magnetic, acoustic and infrared. With the help of the SBIR program, the company was able to further refine its tech. The new iteration, labeled iScout®, was both smaller (the size of a pocket camera), cheaper to produce, and more efficient than OmniSense, lasting as long as a month on two AA batteries. iScout also employs advanced algorithms for detecting targets, with extremely low false alarm rates.

“When they say the target is



The SBIR-supported iScout device from McQ Inc.

a person or an airplane, it really is,” McQuiddy said.

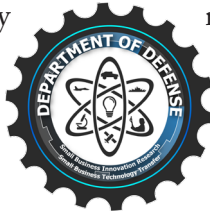
Just nine months after General Petraeus issued his statement, McQ had developed and put the iScout into production. Thousands have since been implemented by several military organizations, including the Army, Navy, Air Force, Marine Corps, Special Operations Command (SOCOM), Missile Defense Agency (MDA), and Defense Threat Reduction Agency (DTRA) and used in missions all over the world. Termed a persistent surveillance sensor, the iScouts—hand-sized wireless sensors—are often placed in forward areas to detect enemy combatant activities and relay information back to a base station unit that can then display the information on a computer or phone.

Imagine a unit attempting to advance into contested territory. Rather than station individuals in harm’s way, the unit drops several iScout sensors, which effectively provide information about the enemy, such as number of combatants and their movements, which are sent remotely back to the unit’s headquarters.

It was the size, efficiency, and cost-effectiveness of the iScout technology that has proven revolutionary for the military, McQuiddy said.

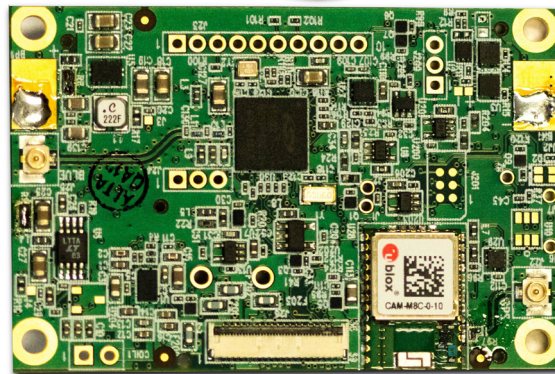
“The iScout was a tremendous advancement in technology,” he said. “It was a real leap forward.”

McQ secured two more SBIR contracts, one to improve the size and cost efficiency of the iScout, and a second—from the U.S. Marine Corps—that helped it develop a separate sensor, called McQ RANGER®. McQ Ranger is “the most advanced sensor available to the



military,” according to McQuiddy, and incorporates state-of-the-art computer chips in combination with artificial intelligence (AI) and machine learning that can recognize the difference between normal and hostile enemy activity. The size of your palm, the air-droppable

Ranger sensor weighs just a few ounces and has a small, rechargeable battery that can last several months in the field. McQ RANGER units have since been adopted by various agencies like SOCOM, the Army, Marine Corps, as well as the Department of Homeland Security, and sold to overseas allies such as Belgium and France.



The sensor board from McQ Inc. is compact, efficient, and cost-effective.

The Air Force has also done extensive testing of McQ’s units, including hundreds of hours of validation on the McQ RANGER sensor that has proven the effectiveness of the technology’s target identification and classification software. The next step, McQuiddy said, is a product the company has built that connects devices to a satellite modem so anywhere in the world you can get live video from connected sensors, that technology is McQ CONNECT®.

McQ has secured more than 30 SBIR contracts since it was founded in 1985, and McQuiddy said the program has been formative in the development of its sensor technology over the years, which has, in turn, provided high-level benefits to both the Warfighter and the U.S. military as a whole. The company also has a 100 percent commercialization rate stemming from its SBIR contracts. “There’s a lot of legacy to our work and a lot of it is centered on the SBIR program,” he said. “Overall, the program has been a really good thing for us.”

