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Small changes, major effect

Boulder firm's tiny electronics could become big deal

By Adam Cole, For the Camera
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It wasn't the most scientific method, but it produced the results Sporian Microsystems was looking for.

Engineers at the Boulder-based micro electronics firm breathed on a microchip hoping that it would respond to changes in humidity levels. The chip responded. Breakthrough.

Sporian Microsystems' lab victory gave the firm a solid blueprint to move forward in the field of sensor technology. Sporian recently received a Department of Defense contract to develop a prototype micro system smaller than an insect that will be able to read varying conditions of humidity, temperature and mechanical shock that potentially will keep tabs on military weapons, ships and planes.

"We went from idea, to concept, to working design, to proposal, to now being in full development. It's been a jump-up-and-down kind of ride," said Bill Garrett, Sporian Microsystems vice president of operations. "The opportunity that we have been given should open the door on other sensing parameters. We feel there's a lot that can be done, and it's up to us to discover the potential that's out there."

The contract is part of the U.S. Army's small business innovative research program. The two-year contract awarded this February is estimated to be worth \$1 million. Lockheed Martin has signed on as a sub contractor.

Jim Fedewitz, project management engineer for an army research and development center in Picatinny Arsenal, N.J., who is overseeing the Sporian project, said it will create a cutting edge way to track ammunition.

"They're developing environmental sensing circuitry that will be able to track ammunition from the day it's made to the day it's used," said Fedewitz. "In Desert Storm, some of our missiles sat out in shipping containers in 190-degree weather. Over time that may degrade some of the performance levels. This technology allows us to see exactly what kind conditions ammunition has been under."

President Brian Schaible formed Sporian Microsystems in 2000 after he received a grant from the National Science Foundation. Garrett and Wenge Zhang signed, on followed by Kevin Harsh. All four employees graduated from the University of Colorado.

"By having our own company, it expands the scope of what we're able to do," Schaible said. "It's a great process to come up with an idea—no matter how crazy—trying it out and having it work. We've made some big advances so far and only look to keep doing that."



Jon Hatch

Brian Schaible displays Sporian Microsystems Inc.'s micro sensor, which is made to attach to missiles

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With early projects nearing completion, Sporian acted on a solicitation by the defense department to create the sensor device. Sporian employees feel they were given the contract because of their strong packaging design.

"We know what it takes to protect the circuitry," said Harsh, Sporian's director of engineering. "Our design allows the sensors to still do their thing while not exposing the circuitry."

Sporian has two years to complete the development of the sensor. The company will produce a prototype at the end of the first year and a well-defined prototype after the second year. Lockheed Martin representatives, who work closely with Sporian, are pleased with the progress.

"So far it's going smooth," said Nagarajan Rao, staff engineer at Lockheed Martin's St. Paul division. "They are very much on schedule to where they need to be."

The completed unit could be used in many ways, Rao said.

"The applications are very wide-spanning," Rao said. "We're looking at the bigger picture, a multitude of platforms. That means all aspects of the military."

Commercially, Sporian foresees the technology being used to track transported or stored items such as food and sensitive electronic devices.

"This is really a learning process right now," Schaible said. "When we complete this project, we feel we can take it in a lot of different directions."



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