US military funds 'Mission: Impossible' vanishing devices

February 8 2014, by Dan De Luce

The US military is spending millions to build "vanishing" technology that self-destructs on the battlefield, like the tape recorder that goes up in smoke in the "Mission: Impossible" television show.

The Pentagon's hi-tech research arm has awarded contracts worth more than $17 million in the past two months to prevent micro-electronic sensors and other devices from falling into enemy hands.

The companies have been tasked to develop "transient" electronics that could be destroyed remotely or crumble into tiny pieces.

In the 1960s series Mission: Impossible, the lead spy always receives top-secret instructions on a reel-to-reel tape recorder, before being told: "This tape will self-destruct in five seconds."

Now the Defense Advanced Research Projects Agency (DARPA) is funding a 21st century version of the recorder, backing experimental projects under the Vanishing Programmable Resources Program.

The use of small, sophisticated electronics in everything from radios to weapons has increased dramatically for American forces, but it is "nearly impossible to track and recover every device," according to a DARPA contract document last month.

"Electronics are often found scattered across the battlefield and might be captured by the enemy and repurposed or studied," it said, warning

America is in danger of losing its technological edge.

The new program aims to solve the problem by creating systems "capable of physically disappearing in a controlled, triggerable manner," rendering the devices useless to the enemy.

DARPA is known for its ambitious research, some of which has resulted in breakthroughs useful for both military and civilian use, including the creation of the Internet and GPS navigation system.

For its latest project, the agency is reinterpreting the idea of a "kill switch," which dates back to the Cold War, when "permissive action link" devices were introduced to prevent a rogue nuclear launch.

Unlike ordinary off-the-shelf electronics that can last indefinitely, the agency "is looking for a way to make electronics that last precisely as long as they are needed," said program manager Alicia Jackson.

The device could be destroyed either by a signal sent by commanders or prompted by "possible environmental conditions" such as a certain temperature, she said.

The nascent technology is potentially revolutionary, with possible applications for medicine as well as combat, officials said.

In 2012, DARPA used similar technology to create a micro device—made of ultra-thin sheets of silicon and magnesium covered in silk—to be implanted harmlessly into the body to prevent infection from surgery.

Efforts to build degradable electronics have tended to rely on polymeric or biological materials, and that has resulted in poor electronic performance and "weak mechanical properties," according to the agency.

The project is still a long away from being deployed in a real battle, and will require years of research by private industry.

In the latest contract for the program, announced on January 31, DARPA provided $3.5 million to IBM for a proposal to use a radio frequency to shatter a glass coating on a silicon chip, reducing it to dust.

The Palo Alto Research Center in California received $2.1 million to build devices with dummy circuits that would be triggered to "crumble into small, sand-like particles in a fraction of a second."

Defense giant BAE Systems was awarded $4.5 million on January 22 and Honeywell Corporation won a $2.5 million contract on December 3 for more "vanishing" technology research.

And DARPA announced in December a $4.7 million contract for SRI International to develop "SPECTRE" batteries designed to self-destruct.

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