

US army seeks new technology to replace GPS

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US Air Force Captain Tyler Rennell (3rd right) explaining to Afghan pilots how to use a GPS instrument at the Kandahar military airbase on October 11, 2009. The US army is working to limit its dependence on GPS by developing the next generation of navigation technology, including a tiny autonomous chip, the director of the Pentagon's research agency said.

The US army is working to limit its dependence on GPS by developing the next generation of navigation technology, including a tiny autonomous chip, the director of the Pentagon's research agency said Wednesday.

DARPA, the research group behind a range of spy tech and which helped invent the Internet, was also the driving force behind the creation of the [Global Positioning System](#), director Arati Prabhakar said at a press conference.

"In the 1980s, when [GPS satellites](#) started to become widely deployed... it meant carrying an enormous box around on your vehicle," she said.

"Now it's got to the point where it's embedded not just in all our platforms but in many of our weapons," as well as in many civilian devices, she

said.

But "sometimes a capability is so powerful that our reliance on it, in itself, becomes a vulnerability," she added.

"I think that's where we are today with GPS."

Among the fears: the [GPS signal](#) could be scrambled by an adversary, as happened recently in South Korea.

Starting in 2010, DARPA has been working on a variety of programs aimed at developing new navigation and positioning technology—at first with the goal of extending their reach to places where satellites don't work, such as underwater.

But now, amid fears of over-reliance on—and possible vulnerabilities with—global positioning satellites, experts are looking to create not just a companion, but an alternative to GPS.

To that end, researchers at DARPA and the University of Michigan have created a new system that works without satellites to determine position, time and direction, all contained within a eight-cubic-millimeter chip.

The [tiny chip](#) holds three [gyroscopes](#), three accelerometers and an [atomic clock](#), which, together, work as an [autonomous navigation](#) system.

DARPA envisages using this technology to replace GPS in some contexts, especially in small-caliber ammunition or for monitoring people.

Another approach would use existing signals, such as those generated by broadcast antennas, radios, telephone towers and even lightning to temporarily replace GPS.

Prabhakar emphasized there "will not be a

monolithic new solution, it will be a series of technologies to track and fix time and position from external sources."

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