



Longtime readers know that, every so often, we like to take a look at some cool technology that catches our eye. DARPA is one of the places that generate a lot of cool tech ideas.

What's [DARPA](#) ? Well, it's the Defense Advanced Research Projects Agency, is what it is. There's some bureaucratic blah-blah-blah on its website that tells you about the history of the agency that's dedicated to "prevent strategic surprise from negatively impacting U.S. national security and create strategic surprise for U.S. adversaries" but screw that.

Let's get to the coolness.

First up is the [Phoenix Program](#) , which will be the subject of an upcoming Broad Agency Announcement. According to DARPA—

The goal of the Phoenix program is to develop and demonstrate technologies to harvest and re-use valuable components from retired, cooperative, non-operating satellites in or near geosynchronous orbit (GEO) and, using these components, realize the ability to create new space systems at greatly reduced cost. Phoenix seeks to demonstrate around-the-clock, globally persistent communication capability for warfighters more economically by robotically removing and re-using GEO-based space apertures and antennas from de-commissioned satellites in the graveyard or disposal orbit.

DARPA Coolness

Written by Nick Sanders
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DARPA wants to start a salvage operation, aimed at dead or obsolete satellites. It wants to go visit those satellites in orbit and “robotically harvest” components from them, to be reused on other satellites and space-based systems. This is a great idea, because those components have already been launched into orbit—which is a huge portion of the total system cost. It also means that the new stuff being launched will be much lighter, thus reducing future launch costs.

Seriously, how cool is that?

Here’s [an article](#) with some more details on the Phoenix Program. It says—

Government experts have established a graveyard, or disposal, orbit high above the Earth's surface where decommissioned spacecraft pose little risk of colliding with functioning satellites. The graveyard orbit is necessary because de-orbiting these high-altitude satellites is dangerous and expensive. Until now, the graveyard orbit has been a celestial junkyard filled with decommissioned satellites of no use to anyone. Even though they no longer function, however, these junked satellites often still have useful components like antennas and sensors.

DARPA officials want to launch orbiting robots that can salvage still-useful satellite components from the graveyard orbit and use them to build new satellites. Spacecraft in geosynchronous orbit are particularly useful for military and civil communications and persistent surveillance.

Yeah, that’s cool, all right.

Next up is the Upward Falling Payloads ([UFP](#)) Program. With a name like that, you know it’s got to be good. (Sorry, Smuckers.) The UFP Program is the subject of a very recent Broad Agency Announcement. The BAA states—

... the UFP approach centers on pre-deploying deep-ocean nodes years in advance in forward areas which can be commanded from standoff to launch to the surface. Nearly 50% of the world’s oceans are deeper than 4 km which provides a vast area for concealment and storage. As a consequence, the cost to retrieve UFP nodes is asymmetric with the likely cost to produce and distribute them on the seafloor. The concealment of the sea also provides opportunity to surprise maritime targets from below, while its vastness provides opportunity to simultaneously operate across great distances. Getting close to targets without warning, and instantiating distributed systems without delay, are key attributes of UFP capability.

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To succeed, the UFP program must be able to demonstrate a system that can: (a) Survive for years under extreme pressure, (b) Reliably be triggered from standoff commands, and (c) Rapidly rise through the water column and deploy a non-lethal payload.

So let's get this straight: DARPA wants to develop the ability to deploy distributed sensors and "non-lethal payloads" (*sure*) on the ocean floor and have them sit, silently, for years. Then a command will trigger these payloads, and they will rise "rapidly through the water column" and "instantiate" a distributed system "without delay". *Really.* (Note: we had to look up the word "instantiate" and we're still not sure we understand what it means in this context.) Anyway, that's a pretty cool concept—at least to us.

Here's [an article](#) that essentially recaps the BAA, but adds some more substantive details. It says—

Imagine a bunch of distracting laser strobes, [electronic warfare](#) jammers, or other kinds of [non-lethal weapons](#) that pop up seemingly up without warning from the ocean's depths in the middle of one of the world's naval battle groups. That's just what scientists ... envision from the [UFP Program] which seeks to pre-deploy sensors or non-lethal weapons on the ocean floor sometimes years in advance for surprise deployment among the nation's naval adversaries during times of war or international tension.

Or, you know, an EMP weapon would work here too. We're just saying. Or even just a lot of bubbles to futz the sonars. Actually, once you figure out how to embed the gimmicks on the ocean floor and protect them from the crushing pressure while keeping them mission-ready and waiting for the "go code" ... well, if you can do that the possibilities as to what the gimmicks might be and how they might be used is pretty damn vast.

Which is very cool.

Good job, DARPA, in once again trying to bridge the gap between the here-and-now and the future.