

3D printing is the future of the military

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When it's not being used to offer up the [world's least-appetizing pizza](#) [1] (protein cheese layer anyone?) and as a way to [eliminate illegal poaching](#) [2], 3D printing's next "big thing" might be playing a vital role in the future of the military.

Though the technology is not nearly advanced enough to make a significant impact right now, the Navy is looking to 3D printing as a potential money saver for the future, according to an article published in the [Armed Forces Journal](#) [3].

On the ships

A main appeal for the Navy w



ould be the "on-the-go" mobility printing aspect of the technology. Instead of being forced to use valuable ship space for storage of parts or weapons that aren't vital, crewmembers could theoretically print things as they were needed via onboard 3D printers and stored powders. It could prove to be a huge change in the military supply chains.

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The plans for 3D printer usage include printing spare parts--and possibly weapons or bullets--from digital blueprints downloaded on the ship. It may seem farfetched, but with the advent of the first fully-3D printed gun earlier this month—care of [Defense Distributed founder Cody Wilson](#) [4]—the possibilities are endless.

For example, a team at Virginia Tech was able to produce a UAV from entirely printed parts in just one weekend. At the University of Virginia, a team used an Android phone as the controller for their printed Aerial surveillance UAV. When the UAV crashed, the team had instant replacement parts available.

Consider the possibilities of using this technology on a ship with limited access to replacement parts or supplies. If they need to do some aerial surveillance, they simply download the correct file and print one out. Instant problem solution that can be done on an as-needed basis.

As far as replacement parts go, this is something that both Lockheed and Boeing are already doing. Lockheed utilizes printed parts for the F-35 and Boeing has over 22,000 parts on its jets, according to the article. As the 3D process evolves and advances, that number will grow to include more vital parts. The key is creating a system that is able to perfectly replicate the part every time.

On the ground

A somewhat less exciting (but infinitely important) usage for the printers can be found when it comes to creating shelters or bases for military operations. Instead of carrying or trucking in supplies, commanders could simply print whatever structures they needed. “Simply” is a relative term here, of course, but it’s not completely out of the realm of possibility.

According to [Lt. Cmdr. Michael Llenza](#) [3], “The Contour Crafting system developed at the University of Southern California features a printer head that moves on rails and draws a special cement blend from a tank or truck. It can produce a 2,500-square-foot structure in about 20 hours, ready for windows and doors. The walls printed from the cement have three times the strength of ordinary construction.”

Strength, stability, convenience and potential financial savings? Sounds like a pretty good idea.

Even the White House is on board, [recently announcing](#) [5] a 200-million dollar initiative to utilize the 3D printers to further military goals. Part of the initiative will involve creating a digital database to streamline manufacturing processes and a second aspect will involve an investigation into new materials for future weapons. This comes on the heels of the creation of a [3D printing Institute](#) [6]—located in Ohio—started with a focus on improving and understanding 3D printing (a.k.a. additive manufacturing) and how it can be used to better defense and manufacturing. Both of these initiatives are part of a larger attempt to revitalize manufacturing overall, but the research being done will no doubt help speed 3D printing along.

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In

times of war

The Army, not to be outdone, recently invested in several [Expeditionary Lab Mobiles](#) [7] (ELM). The 2.8 million dollar ELMs are 20-foot trailers equipped with “3D printers, computer-assisted milling machines, and laser, plasma, and water cutters, along with common tools like saws and welding gear.” The [idea](#) [8] is to provide soldiers with an on-site lab for creating custom supplies, instead of having to send the project to an Army developer who is both off-site and potentially unfamiliar with the specific needs of the soldier. In places like Afghanistan, time is of the essence when something needs to be adjusted, replaced or fixed completely. Shaving days, weeks or months off the time-to-market could be the difference between having a [Minehound](#) [8], a hand-held ground-penetrating radar device used to detect buried improvised explosive devices, that works and one that only lasts 45 minutes in the desert heat.

The Army is also using the technology to print lightweight, mobile, topographically-accurate [3D maps](#) [9] to facilitate a better understanding of terrain.

At the end of the day

Personally, I think this plan—while logistically solid—will get a lot of flak from military contractors. When talking about the military industrial complex, politics can’t be ignored and there are a lot of highly influential, highly motivated and financially powerful lobbies to deal with.

However, on the wish-list hand, I can see the benefits of utilizing this technology as a way to eliminate many of the supply issues that can plague branches of the armed forces. The idea of an “instant” fix for a mechanical or engineering problem is tantalizing, if not a little ways down the road.

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