

# Counter-Drones Capabilities Innovation in US Armed Forces

WRITTEN BY EUGENIO MONTALTI

Image credits: <https://www.defensenews.com/land/2021/10/25/general-dynamics-epirus-team-up-to-integrate-counter-drone-swarm-system-on-combat-vehicles/>



As it has always been, today's armies are also updated with the most modern technologies. One of the major breakthroughs in the military field has been the implementation of drones or Unmanned Aerial Vehicles (UAVs) (Marcus, 2022). These drones consist of aircraft of different sizes that can operate without a pilot on board. These vehicles are gaining increasing importance in everyday use and on the battlefield because they offer several advantages over 'normal' aeroplanes. First, they are less costly for reconnaissance as they can be smaller (Escobar et al., 2021). Second, being their shape and size more flexible according to the use and not to the comfort of a pilot, they are more silent than a standard scouting plane and ultimately more difficult to be spotted by the enemy, offering increased secrecy (Prem Mahadevan, 2010). Furthermore, they offer a longer range of autonomy compared to their manned counterparts (Prem Mahadevan, 2010). Finally, as indicated by the analysis of Zegart, they allow the pilot to be remote and consequently expose them less to enemy fire (Zegart, 2020). This results in drones offering a much cheaper cost not only budget-wise but also in human lives and politically (Zegart, 2020).

The use of drones on the battlefield is nothing new. In fact, there are several examples of wars in which their assistance has proven determinant. In the renowned Vietnam War, "over a thousand drones mapped out North Vietnamese and Chinese logistics networks." (Prem Mahadevan, 2010). More recently, they had been used for the War on Terror. The US Army is believed to have used its Reaper drones for the killing of "the Iranian General Qasem Soleimani [...] in January 2020" (Jonathan Marcus, 2022). In the same year, the drone's technology was determining the outcome of the last chapter of the war between Armenia and Azerbaijan over Nagorno-Karabakh. The edge provided by drones and more advanced military equipment allowed the Azeri a relatively easy win against Armenians that had control over the territory (Foy, 2020). However, while drones had been used for a long time, drones' swarms were implemented into the battlefield for the first time in 2021 by the Israel Defense Forces (IDF), which "used a swarm of Artificial Intelligence (AI) drones for the first time to geolocate, target, and strike Hamas terrorists" in Gaza, without GPS assistance. (Giannakis et al., 2021)

Yet, like any other military equipment, drones require to be tested. For this reason, it is common to witness drone exercises. The British managed to carry on limited swarm exercises of up to 20 small UAVs, consisting of five different types of drones with specific capabilities (Allison, 2021). The Russian Federation was the first to successfully simulate a swarm attack “in which multiple low or medium weight unmanned aircraft would work in cohesion” (2020). Consequently, as a leader of the sector, the US demonstrated that they are capable of similar, if not more advanced, operations. As of January 2022, the Defense Advanced Research Projects Agency (DARPA), an agency under the United States Department of Defense, showed off its capability. During the exercise, more than 130 physical and simulated drones were integrated and coordinated by the Raytheon software. This demonstration was part of a DARPA project which aims to build a battalion composed of both aerial and ground-based unmanned platforms that can be controlled by very little human supervision. The vision is to reduce the human personnel to just one operator and a swarm commander (Inder Singh Bisht, 2022). In this context, the US Army is preparing the latest of its exercises. Since 2020, the US launched the ‘Project Convergence’, which aims to coordinate with multinational partners (Judson, 2021b). For the exercise of the current year, the Army granted a \$14 million contract to the company named BlueHalo. The purpose is to develop within 30 months a new prototype able to demonstrate “offensive unmanned aircraft systems swarm capabilit[ies]” (Judson, 2022). According to Stan Dabro, Deputy Director of the Army Rapid Capabilities and Critical Technologies Office (RCCTO), one of the salient innovations of this project is that the swarm will be not only low-cost but also able to identify and engage threats with the use of a single controller.

Besides developing offensive drones’ capabilities, the Army is working on countering swarms of enemy forces. (Judson, 2022) The integration of high-power microwave capabilities is one of the planned implementations in the counter-drone swarms force. This system should be able to destroy small drone threats. (Judson, 2021) To develop this technology, the US is investing more than \$50 million in 2022 alone. (Judson, 2021a) In addition, they also established the Army-led Joint Counter-Small Unmanned Aircraft Office (JCO). In parallel, it is also creating a ‘low-collateral effects interceptor’ to endure counter-sUAS systems. This technology will be available from the third quarter of 2023 as a prototype. This will be paired with a ground-based system with high-power microwaves capable of taking out drone swarms (Judson, 2019). This system is set to protect specific sites not only from drones’ swarms but also “rockets, artillery and mortars, as well as cruise missiles”. (Judson, 2019) The army is dedicated to field lasers with a capability of 100 kW to develop more powerful 250-300 kW ones. The capability is being developed in coordination with the Air Force. These counter-drone forces are of great importance given the recent developments in military forces. This is proven by the financing they are getting state-wise but also by the involvement of the industry. Indeed, the venture start-up Epirus and General Dynamics Land Systems are cooperating to integrate these systems into combat vehicles (Judson, 2021a).

## Bibliography

Allison, G. (2021, January 28). British drone swarm exercise concludes.

<https://ukdefencejournal.org.uk/british-drone-swarm-exercise-concludes/>

Foy, H. (2020, October 28). Drones and missiles tilt war with Armenia in Azerbaijan's favour. Financial Times. <https://www.ft.com/content/6acddc7d-cda5-44b2-9e5c-f6863f7bb9e7>

Giannakis, A., Shoesmith, M., & Thomas, M. (2021, August 17). First Artificial Intelligence Swarm Drones recently Utilized on the Battlefield: Implications. Counterterrorism Group. <https://www.counterterrorismgroup.com/post/first-artificial-intelligence-swarm-drones-recently-utilized-on-the-battlefield-implications>

Inder Singh Bisht. (2022, January 11). Single Operator Controls 130+ Drones at DARPA Exercise. The Defense Post. <https://www.thedefensepost.com/2022/01/11/raytheon-drone-swarm-darpa/>

Jonathan Marcus. (2022). Combat drones: We are in a new era of warfare—Here's why—BBC News. <https://www.bbc.com/news/world-60047328>

Judson, J. (2019, August 7). Soon to come to the Army: A high-power microwave to take out drone swarms. Defense News. <https://www.defensenews.com/digital-show-dailies/smd/2019/08/07/the-armys-indirect-fires-protection-system-is-getting-a-high-power-microwave/>

Judson, J. (2021a). US Army could soon have a high-power microwave to destroy small drone swarms. Defense News. <https://www.defensenews.com/land/2021/06/17/us-army-could-soon-have-high-power-microwave-capability-to-take-out-small-drone-swarms/>

Judson, J. (2021b, September 9). Project Convergence '22 seeks to take multinational network to next level. Defense News. <https://www.defensenews.com/smr/defense-news-conference/2021/09/09/project-convergence-22-seeks-to-take-multinational-network-to-next-level/>

Judson, J. (2022). US Army to demo offensive drone swarms in next Project Convergence. <https://www.c4isrnet.com/unmanned/2022/03/01/us-army-to-demo-offensive-drone-swarms-in-next-project-convergence/>

Military Watch Magazine. (2020). Russian Exercises Simulate First Ever Drone Swarm Attacks. Military Watch Magazine. <https://militarywatchmagazine.com/article/russian-exercises-simulate-first-ever-drone-swarm-attacks>

## Bibliography

Prem Mahadevan. (2010). The Military Utility of Drones (p. 3). Center for Security Studies (CSS), ETH Zurich. <https://css.ethz.ch/content/dam/ethz/special-interest/gess/cis/center-for-securities-studies/pdfs/CSS-Analyses-78.pdf>

Zegart, A. (2020). Cheap fights, credible threats: The future of armed drones and coercion. *Journal of Strategic Studies*, 43(1), 6–46. <https://doi.org/10.1080/01402390.2018.1439747>