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SIGNIFICANCE OF ANTI-DRONE TECHNOLOGY AND SMALL COMBAT TEAMS FOR PAKISTAN

Author(s):

Marium Akhtar
(Research Associate)
Shehar Bano
(Intern)

Edited by:

Brig Masroor
Ahmed (Retired)

Modern warfare is constantly evolving and adapting to new technologies and tactics. The rise of combat unmanned aerial vehicles (UAVs) or drones has brought a true Revolution in Military Affairs with altered war strategy resulting in increased target engagement, low casualty rate and increased effectiveness in limited as well as expanded kinetic operations. The recent conflicts, like the Nagorno-Karabakh conflict and the Russia-Ukraine war, demonstrate the cruciality of drones and anti-drone systems for future warfare. In both scenarios, drones have been used to gather intelligence, conduct surveillance and even carry out attacks. A vital lesson we can derive from these wars is improving our operational strategy through advancements in anti-drone technology. Although drone technological advancement and sophistication for warfare cannot be ignored, as they are costly, our focus should be on improving strategies for detecting, intercepting and targeting enemy drones as they become more advanced.

Among the two domains of anti-drone technology (hard-kill and soft-kill), utilising hard-kill techniques such as conventional anti-aircraft guns against drones is impractical due to the high expense of conventional anti-aircraft weapons. Soft-kill employs techniques that can malfunction navigation systems onboard a drone and entails jamming and spoofing. It is the most preferred, highly cost-effective and widely used way of countering drones.

Globally, militaries are equipped with different anti-drone technologies capable of both hard and soft kills. For example, the US possesses several anti-drone systems, including GhostEye Radars, Dedrone Defender System, National Advanced Surface-to-Air Missile System (NASAMSTM), Stinger Missile, Iron Dome System, SkyHunter Missile, Coyote® unmanned aircraft system, and High-Energy Lasers, among others.¹ Israel's drone dome system developed by Rafael Systems is a multi-sensor multi-effector counter UAV system.²



Similarly, Britain's anti-drone system, called the Anti-UAV Defence System (AUDS), is a joint venture between different British companies.³ Germany's Modular Counter-UAS System (MUAS) is a portable system that combines radar, optics and electronic warfare capabilities.⁴

In the Pakistan-India context, India recently declared that it would equip the Border Security Force (BSF) with anti-drone systems close to the Line of Control (LoC). It has chosen the Israeli anti-drone Smash 2000 Plus system, which can detect drones and any UAV from a distance and target them within 10 seconds.⁵ Regarding Pakistan's counter-drone system, both soft-kill and hard-kill options are being developed indigenously and are in the phase of Research and Development (R&D). Pakistan started to develop its EW capabilities after 2019 when an Indian drone was shot down near LoC using the Air Defence system, which highlighted the need to develop advanced detection systems. In fact, the Pakistan Navy has successfully developed its first EW system RIBAT.⁶

Investing in electronic warfare capabilities is one of the ways to disrupt the communication links between combat drones and their operators. As R&D, indigenisation and procurement of anti-drone technology should be the focus of our defence forces and is already being pursued in Pakistan, the process needs to speed up for better security in the wake of the enemy's recent offensive misadventures. One of the biggest hurdles remains government's

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lack of investment in R&D. Civil-military collaboration is crucial for this process, as government cannot finance these projects solely at its own expense. Venture Capitalists (VC) are investors who join limited partnerships to combine investment funds and can be game changers in this domain. In this regard, governance issues and unnecessary hurdles should be eliminated for overall national security.

Civil installations and infrastructure are as important as military installations and equipment. Critical public infrastructure like airports, universities, government department buildings, stadiums and military stations are all protected by anti-drone equipment worldwide.⁷ Hence more research and investment are needed to incorporate jamming systems and spoofing devices into traditional air defence systems, which would help disrupt the navigation and communication systems of any incoming enemy combat drones.

On the operational side, Pakistan Army should evaluate the concept of small combat teams as stay-behind parties during kinetic operations equipped with essential technology weapons like offensive combat drones combined with ISR to create disruptions behind enemy lines. This formation would be a force multiplier and especially beneficial for mountainous areas with rough and rugged terrain where small combat teams can track, target and attack an enemy.

Apart from the measures mentioned above, a drone deployment technique is presented called the **Lie Torpid Technique** (meaning sleep through the cold). It can be evaluated as a combat strategy involving the clandestine placing/ dropping of remotely controlled dormant/hibernating camouflaged combat drones in different strategic locations inside enemy territory. This concept can be further comprehended by studying the **Upward Falling**

Payloads concept developed by Defence Advanced Research Projects Agency (DARPA) in 2013 and used by the US Navy.⁸ The idea includes several Pods to hold naval drones on the ocean floor for extended periods of time. The pods are released remotely and float to the surface to open and release the drone inside if a threat materialises close by. The goal is to pre-deploy the assets years in advance and then trigger their release for immediate impacts at times in the future that we choose, allowing for the timely deployment of unmanned distributed systems to far-off areas.⁹ This technique can be used for harassment and nuisance in times of need and utility by conventional forces in case of limited war situations in border areas and beyond.

Furthermore, the local drone manufacturing industry needs to be incentivised, and the private sector should be encouraged to invest more in this sector. Collaboration and outreach with militarily advanced friendly countries like Turkey, China, Russia and the US should be encouraged. Moreover, increased engagement with neighbours facing sanctions like Iran should not be ruled out, and alternative ways should be explored to navigate these sanctions for R&D collaboration, especially in anti-drone technology.

Drone and anti-drone technologies represent the future of warfare, thanks to the incorporation of robotics and artificial intelligence into every aspect of military operations. It is speculated that future battles will be fought without or with minimum need of human soldiers. As a result, strengthening the conventional military may be a low-hanging fruit for resource-stricken countries like Pakistan. Hence, our focus should be to develop Electronic Warfare capabilities, anti-drone technology and eliminate all the challenges Pakistan faces in its R&D sector.

References

- ¹ "Integrated Air & Missile Defense | Raytheon," accessed June 23, 2023, <https://www.rtx.com/raytheon/what-we-do/integrated-air-and-missile-defense>.
- ² "Drone Dome Counter-Uncrewed Aerial System (C-UAS), Israel," *Army Technology* (blog), accessed June 23, 2023, <https://www.army-technology.com/projects/drone-dome-counter-uncrewed-aerial-system-c-uas-israel/>.
- ³ "Anti-UAV Defence System (AUDS) - Homeland security Technology," accessed June 23, 2023, <https://www.homelandsecurity-technology.com/projects/anti-uav-defence-system-auds/>.
- ⁴ "GUARDION - The Modular Counter-UAS System," accessed June 23, 2023, <https://guardion.eu/>.
- ⁵ "Killing the Bird's View - India's Anti-Drone Tech - Raksha Anirveda Is a New Age Print Publication (Quarterly) with a Digital Presence.," accessed April 10, 2023, <https://raksha-anirveda.com/killing-the-birds-view-indias-anti-drone-tech/>.
- ⁶ Debrief of Pakistan Navy's operational exercise ribat-2021 held at Karachi (2021) Daily Times. Available at: <https://dailytimes.com.pk/718513/debrief-of-pakistan-navys-operational-exercise-ribat-2021-held-at-karachi/> (Accessed: May 2, 2023).
- ⁷ Electropages, "UK Government to Install State-of-the-Art Anti-Drone Systems to Prevent Attacks," accessed June 12, 2023, <https://www.electropages.com/blog/2023/02/uk-government-install-state-art-anti-drone-systems>.
- ⁸ "Upward Falling Payloads," accessed May 18, 2023, <https://www.darpa.mil/program/upward-falling-payloads>.
- ⁹ "Falling Up from the Ocean Floor," AFCEA International, January 1, 2016, <https://www.afcea.org/signal-media/falling-ocean-floor>.