



The Future of Turkey's Drone Technology

OE Watch Commentary: The Turkish military operates about 130 UAVs, mostly developed and manufactured by the Turkish defense industry. It has successfully utilized these drones in its aerial campaigns against Kurdish groups and regime forces in Syria as well as Kurdish militants in Iraq. These indigenous drones, especially the Bayraktar TB2 and ANKA have proven their effectiveness in the battlefield. Turkey has signed deals with other countries to export them as well. The accompanying article from state-owned *Anadolu Ajansı* highlights further steps to improve Turkey's UAV capabilities in terms of "invest[ing] in smarter technologies, heavier platforms, and more innovative" concept of operations (CONOPS).

As the article states, in terms of smarter technologies, Turkey's Undersecretariat for Defense Industries unveiled a project named Global Positioning System Independent Autonomous Navigation System Development (Kerkes) in 2019 to manufacture drones with more autonomous capabilities. Under this project, Turkey's defense industry intends to produce mini drones "with deep learning technologies, autonomous navigation without relying on GPS-based systems... and smart targeting features in complex battlegrounds." The article states that with respect to developing mini drones with aforementioned advanced technological capabilities, domestic new generation mini drones Kargu, Togan, and fixed-wing Alpagu "can offer more flexible and smarter concepts of operations as the nation's defense technological & industrial base (DTIB) capitalize on autonomy, deep learning, and swarming algorithms."



Bayraktar TB2 UAV, Teknofest 2019.

Source: Kingbjelica via Wikimedia, https://commons.wikimedia.org/wiki/File:Bayraktar_TB2_S-%C4%B0HA_Teknofest_2019.jpg, CC-BY-SA-4.0

While the Bayraktar TB2 and ANKA have shown their combat effectiveness with their combat payloads, three other drone systems have heavier platforms. First, with a payload of nearly 3,000 pounds, the Akıncı (Raider) is designed and produced by Baykar Makina. Akıncı will have the capability to carry munitions such as "the SOM-A indigenous cruise missile with a range of over 155 miles and MK-82 and MK-83 bombs." Second, the Aksungur will have the capability to carry out long-term surveillance, signals intelligence, and maritime patrol missions. Aksungur, developed by the Turkish Aerospace Industries (TAI) has an over 1650 pound carrying capacity, an upgrade from the over 440 pound capacity of the earlier model ANKA. Finally, with a faster platform, the Gökşungur will be Turkey's first supersonic drone.

The author states that the Syrian civil war provided opportunities to state and non-state actors to test new CONOPS. One concept that Turkish and Russian militaries have mastered is "using unmanned aerial systems as artillery-spotters" in Syria. In fact, most recently the Turkish Armed Forces utilized this CONOPS in its operation in Idlib by deploying the TB2 and ANKA-S drones "in collaboration with multiple-launch rocket systems (MLRS) and howitzer." The second CONOPS is integrating the mini drones with the larger UAVs platforms. However, the author states that the Turkish defense industry is far from achieving this. The last concept is integrating air-to-air indigenous missiles Gökdoğan and Bozdoğan with the Akıncı drone. **End OE Watch Commentary (Gündüz)**

"Turkey's unmanned systems vision is investing in smarter technologies, heavier platforms, and more innovative... concept of operations..."

Source: Dr. Can Kasapoglu, "Turkey's robotic warfare future in the skies," *Anadolu Ajansı*, 07 May 2020. <https://www.aa.com.tr/en/analysis/analysis-turkey-s-robotic-warfare-future-in-the-skies-/1832430#!>

Ankara's drone proliferation efforts are likely to introduce true capability leaps. Briefly, Turkey's unmanned systems vision is investing in smarter technologies, heavier platforms, and more innovative CONOPS (concept of operations).

Autonomy and swarming loom large as the two key words one needs to grasp for envisaging future robotic warfare. In this respect, Project Kerkes remains the leading effort of the Undersecretariat for Defense Industries, Turkey's main procurement body. Unveiled in 2019, the ambitious project is centered on producing mini drone swarms with deep learning technologies, autonomous navigation without relying on GPS-based systems -- or in jammed environments --, and smart targeting features in complex battlegrounds.

Turkey's mini loitering munitions are promising with respect to their future roles. Turkey's new generation mini drone family, principally consisting of rotary-wing Kargu, Togan (the latter a surveillance platform) and fixed-wing (Alpagu), can offer more flexible and smarter concepts of operations as the nation's defense technological & industrial base (DTIB) capitalize on autonomy, deep learning, and swarming algorithms.

Turkish defense firms, for some time, have been working hard to field heavier systems. The Turkish military's principal unmanned aerial vehicles, Bayraktar TB-2 and Anka, have some 55kg and 200kg combat payloads respectively. Nevertheless, they carry Roketsan-manufactured small & smart solutions, such as the MAM-L, which has been a boost for their combat effectiveness.

In the 2020s, the Turkish Armed Forces' forthcoming platforms will offer something really different. The Akıncı (Raider) deserve utmost attention in this respect. Designed and produced by Baykar, the makers of the Bayraktar TB-2, the Akıncı will enjoy a payload of 1,350kg...

The other game-changer UAS will be Aksungur, especially with respect to naval balance of power... Last, having furthered the experience harvested from the Aksungur project, TUSAS is now working on a faster platform, the Gökşungur.

The Syrian battle-space has long been a warfighting laboratory. All the belligerents, states and non-states, have learned key lessons from almost a decade of fighting. Artillery & drone fusion is one of these lessons. Russian and Turkish militaries have digested the importance of using unmanned aerial systems as artillery-spotters...

The second notable project is the integration of Alpagu fixed-wing loitering munitions with the Akıncı high-end UAS... Finally, Turkish drone proliferation roadmap involves some exotic features too. The Akıncı will carry indigenous air-to-air missiles Gökdoğan and Bozdoğan...