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THRONE OF DRONES: UNDERSTANDING THE DRONE RACE

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INTRODUCTION

All wars in history have produced their heroes and urban legends. In the present ongoing crisis in Ukraine, the actions and leadership of President Volodymyr Zelensky have drawn the pens of bards around the world. However, Zelensky isn't the only silver lining in this war. The Turkish drone, Bayraktar TB2 (Figure 1), has shown its brilliance and turned the heads of strategic and defence experts around the world. From the masses going overboard with praise on social media to having a song written highlighting its service to Ukraine, the Bayraktar TB2 drone has become the most talked-about Unmanned Aerial Vehicle (UAV) system at the moment.

The Bayraktar TB2 drone is manufactured by the Turkish defence company, Baykar Technology, a company founded in 1986. It is a leading manufacturer of tactical armed and UAV systems in Turkey. The company has family ties with Turkish President Recep Tayyip Erdogan. The Bayraktar TB2 drone is a "Medium Altitude Long Endurance (MALE), a tactical Unmanned Aerial

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Vehicle that is capable of conducting intelligence, surveillance, and reconnaissance (ISR) and armed attack missions."[1] It is fully capable of self-taxiing, take-off, landing, and cruising, with over 400,000 operational flight hours, which proves its efficacy. It has been successfully carrying out missions within the Turkish Armed Forces, Gendarmerie, and Turkish National Police since 2014. Currently, the Bayraktar platforms are serving Turkey, Qatar, Azerbaijan and Ukraine.[2]

Figure 1: The Bayraktar TB2 Drone

Source: *Defense One*, at https://www.defenseone.com/technology/2019/01/ukraine-buying-new-combat-drones-turkey/154163/. Accessed on March 27, 2022.

SPECIFICATIONS

With 18,000 feet of operational altitude and 25,000 feet of maximum altitude, the company claims that the drone is capable of 27 hours of maximum airtime. The payload capacity is 150 kg, which takes the maximum take-off weight to 700 kg. It has fully automatic flight control and a Triple Redundant Autopilot System along with fully automatic landing and take-off capabilities without dependence on ground systems. It can navigate with an internal sensor fusion system that makes it independent of the GPS network. The drone functions

1. Bayraktar TB2, Baykar Technology, at https://www.baykartech.com/en/uav/bayraktar-tb2/. Accessed on March 20, 2022.
2. Ibid.

within a communication range of 300 km, and can travel at a speed of 70 to 120 knots (Figure 2).[3]

Figure 2: Graphic Demonstration of the Specifications of the Bayraktar Drone

Source: Baykartech Instagram Page, at https://www.instagram.com/p/CauekXgMDuD/. Accessed on March 20, 2022.

ADVANTAGE

Although the TB2 aren't the most technologically remarkable systems, their features give them unique advantages on the battlefield. Due to their slow flight speed, the TB2 can stay in the air for hours, picking up details that reconnaissance planes might struggle to notice. Further, due to their limited range, the TB2 can return to base for refuelling and restocking of ammunition before returning to the target area in a matter of hours.[4] In addition, the cost of the TB2, priced at approximately US$ 1 million, proved to be a brilliant alternative to the obscenely high cost and maintenance expenses of alternatives like the General Atomics MQ-1 Predator, priced at

3. Ibid.
4. Sakshi Tiwari, "Chinese Wing Loong 2, Turkish Bayraktar TB2 Drones Proving to Be a 'Game-Changer' in Ethiopian Civil War", *The EurAsian Times*, December 13, 2021, at https://eurasiantimes.com/chinese-wing-loong-2-turkish-bayraktar-tb2-drones-proving-to-be-a-game-changer-in-ethiopian-civil-war/. Accessed on March 20, 2022.

US$ 40 million, or even the MQ-9 Reaper, priced at US$ 3 million, currently used by the US Air Force and several other Western military organisations.[5]

The only economic alternative to the Bayraktar drone would be the Chinese Wing Loong II, which is priced at US$ 2 million. The use of such comparatively low-priced drones in conflict zones proves economically viable as it can take down targets and systems which might prove to be more expensive to the adversaries. In any case, even if these drones are hit, the loss to the operating country would not be significant economically. In other words, what these low-end drones lack in quality can be compensated for by quantity. Thus, such drones have become a popular choice for the less economically developed countries, particularly in Africa and Asia.

BAYRAKTAR TB2 AND UKRAINE

Bayraktar TB2 drones have been inducted into the Ukrainian forces to be specifically used against Russian aggression. Ukraine has been receiving these drones in batches from 2018 onwards. Over the past few years, around 50 such drones were purchased from Turkish manufacturers.[6] These combat drones were first deployed by the Ukrainian Joint Forces Operation against pro-Russian rebels in the Donbas region of Ukraine on October 26, 2021 (Figure 3). In a statement by the General Staff of the Ukrainian Armed Forces, these UAVs were used "to attack a battery of howitzers that fired Ukrainian positions." The drone was able to deploy "a 22-kg laser-guided rocket and destroy a D-30 howitzer."[7] This attack on the Donbas province has been cited by Putin as one of the prominent evidences of Ukrainian aggression.

5. Global Data, "The Bayraktar TB2 and the role of affordable UCAVs in modern warfare", *Army Technology*, March 17, 2022, at https://www.army-technology.com/comment/bayraktar-tb2-modern-warfare/. Accessed on March 20, 2022.
6. Elmas Topcu, "How useful are Turkish-made drones fighting in Ukraine?", *Deutsche Welle*, March 3, 2022, at https://www.dw.com/en/how-useful-are-turkish-made-drones-fighting-in-ukraine/a-61035894. Accessed on March 31, 2022.
7. "Ukraine Uses Bayraktar TB2 for First Time in Donbas", *The Warsaw Institute*, October 27, 2021, at https://warsawinstitute.org/ukraine-uses-bayraktar-tb2-first-time-donbas/. Accessed on March 31, 2022.

Figure 3: Bayraktar TB2 Drones in Ukraine

Source: *Defense News*, at https://www.defensenews.com/unmanned/2021/09/29/ukraine-is-set-to-buy-24-turkish-drones-so-why-hasnt-russia-pushed-back/. Accessed on March 27, 2022.

In the present Ukraine-Russia crisis, the on-ground impact of the Bayraktar Drones cannot be accurately assessed. Nevertheless, quite a few videos and commentaries have surfaced from the Ukrainian side praising the TB2 drones and their impact on the Russian forces. Several videos have also surfaced, which show the Turkish drones destroying Russian targets and immobilising Russian war assets. A video uploaded by a Twitter account named "Ukraine Weapon tracker" shows that another self-propelled howitzer was targeted by the Bayraktar drones and utterly destroyed.[8] The use of the TB2 drones has also been appreciated by the Ukrainian defence minister, who, in a Facebook post, said that more such drones have arrived and are being put on combat duty.[9] In another Facebook post, the TB2

8. Ukraine Weapons Tracker, Twitter Handle @UAWeapons, March 2, 2022, at https://twitter.com/UAWeapons/status/1499066327390199812. Accessed on March 20, 2022.
9. David Hambling, "Ukraine Receives Fresh Supplies of Bayraktar Drones and Eye-Popping Numbers of Anti-Tank Weapons (Updated)", *Forbes*, March 3, 2022, at https://www.forbes.com/sites/davidhambling/2022/03/03/ukraine-receives-fresh-supplies-of-bayraktar-drones-and-anti-tank-weapons/?sh=24cfc2ac359a. Accessed on March 20, 2022.

drones were dubbed "life-giving" by the chief of Ukraine's Air Force, Lt. Gen. Mykola Oleshchuk.[10]

In retaliation to these drone attacks, the Russian forces have started to deploy the Forpost-R tactical UAVs. Footage of these Russian drones destroying a Ukrainian anti-aircraft missile system has also been released; while the Ukrainian force released photographs of downing a Forpost UAV.[11] Russian Defence Ministry Spokesman Major-General Igor Konashenkov claims that "since the start of the special military operation 141 aircraft, 110 helicopters, 583 UAVs … 2,576 tanks and other combat armoured vehicles" of the Ukrainian forces have been brought down.[12] However, in the age of information warfare, such reports are difficult to corroborate with hard evidence. Russia has not provided any verifiable proof for this claim[13] although some Ukraine and Russian observers have posted images of shot down TB2 drones on social media sites.

On April 14, 2022, the Russian media confirmed that the Russian flagship Black Sea Fleet Missile Cruiser, Moskva, had sunk. The Moskva was "the third largest vessel in Russia's active fleet and one of its most heavily defended assets."[14] Russian Defence Ministry in a statement claims that the ship was lost due to a detonation of ammunition in its hull.[15] In contradiction, many Western defence analysts and Ukrainian sources claim that the TB2 drone was used in this operation. Several reports, including Russian, claim that

10. Brett Forrest and Jared Malsin, "Ukraine Says It Used Turkish-Made Drones to Hit Russian Targets", *The Wall Street Journal*, February 28, 2022, at https://www.wsj.com/livecoverage/russia-ukraine-latest-news-2022-02-26/card/ukraine-says-it-uses-turkish-made-drones-to-hit-russian-targets-DrigGO7vkGfDzbBuncnA. Accessed on March 31, 2022.
11. "Ukraine photos claim to show downed Russian drone with Israeli origin", *Times of Israel*, March 12, 2022, at https://www.timesofisrael.com/ukraine-photos-claim-to-show-downed-russian-drone-with-israeli-origin/. Accessed on March 20, 2022.
12. "Russian forces destroy 583 drones, 2,576 armored vehicles in Ukraine operation—top brass", TASS, Russian News Agency, April 26, 2022, at https://tass.com/defense/1443133. Accessed on April 27, 2022.
13. Jack Detsch, "Drones Have Come of Age in Russia-Ukraine War", *Foreign Policy*, April 27, 2022, at https://foreignpolicy.com/2022/04/27/drones-russia-ukraine-war-donbas/. Accessed on April 28, 2022.
14. "Sunken Russian warship Moskva: What do we know?", *BBC News*, April 18, 2022, at https://www.bbc.com/news/world-europe-61103927. Accessed on April 20, 2022.
15. "Moskva cruiser sank while being towed in a storm—Russian Defense Ministry", TASS, Russian News Agency, April 15, 2022, at https://tass.com/russia/1438045. Accessed on April 20, 2022.

several TB2s were operational in the region near the Moskva before the cruiser was hit.[16] There are speculations whether the TB2 drones with their limited capabilities could engage and neutralise a warship such as the Moskva, given its anti-aircraft and anti-missile defence systems. It is, however, claimed that the TB2 drones were used to laser target the cruiser after which Neptune missiles were launched to hit the target. It is argued that the TB2 was used to engage with the cruiser's defence system "possibly to distract it from the incoming missiles."[17] Such exercise of the TB2 only adds to the possibilities and manner of use for the drone courtesy of its features and low cost.

If the current issue is portrayed as a David versus Goliath battle, Turkish drones could very well be David's sling. The use of Turkish drones against the Russian military has clearly irritated Russia. Because of their energy and defence ties, Turkey and Russia have had good relations. In such a context, Russia's anger with Ankara's dealings with Kyiv is understandable. Ankara, on the other hand, defended itself by claiming that the drone transaction was conducted by a private Turkish business, and Kyiv, if only for a time, ascended a high horse.[18]

USE OF THE TB2 DRONES ELSEWHERE

Before being deployed by the Ukrainian forces against the Russians, the Bayraktar TB2 Drones were used in various other conflicts. Its use was mostly in the Caucasus region and Africa region.

Nagorno-Karabakh

The most decisive role of the TB2 was seen in the conflict between Azerbaijan and Armenia over the disputed region of Nagorno-

16. David Hambling, "Ukraine's Bayraktar Drone Helped Sink Russian Flagship Moskva", *Forbes*, April 14, 2022, at https://www.forbes.com/sites/davidhambling/2022/04/14/ukraines-bayraktar-drones-helped-destroy-russian-flagship/?sh=5dd76d1d3a7a. Accessed on April 20, 2022.
17. "Down & Out! Pride of Russian Navy's Black Sea Fleet 'Moskva Missile Cruiser' Finally Sinks after Alleged Neptune Strike", *The EurAsian Times*, April 15, 2022, at https://eurasiantimes.com/moskva-missile-cruiser-pride-of-russian-navys-black-sea-fleet-finally-sinks/. Accessed on April 20, 2022.
18. "Russia complains to Turkey over drones sales to Ukraine, Turkish bureaucrat says", Reuters, April 8, 2022, at https://www.reuters.com/world/russia-complained-turkey-over-drones-sales-ukraine-turkish-bureaucrat-2022-04-08/. Accessed on April 20, 2022.

Karabakh in November 2020. Azerbaijan was able to defeat Armenia-backed forces thanks to the use of drones. In a news report, Azerbaijan President Ilham Aliyev thanked Turkish drones and credited them with reducing "casualties on the front."[19] Before the outbreak of fighting in the Nagorno-Karabakh region, Turkey's sales of drones and other military equipment increased to US$ 77 million in September 2020.[20]

Libya

In 2020, the Government of National Accord in Tripoli used TB2 drones as part of their campaign to repel an assault on the city by eastern forces backed by Russia, the UAE, and Egypt.[21]

Syria

During Operation Olive Branch in northern Syria in April 2018, Bayraktar TB2 provided important and tactical support to Turkish forces. The TB2 allowed Turkish forces to cleanse the Afrin region of Kurdish militants and Daesh terrorists in less than two months, with "targeted precision" that reduced the impact on civilian property and lives.[22]

IMPACT ON THE TURKISH DEFENCE INDUSTRY

The economic impact of the Turkish drones can be seen in the upsurge in Turkish defence exports in line with growing demand. Turkey's defence exports have seen an increase since 2021, with most of the demand coming from low-income and low-middle-income countries in Africa. The Turkish defence sector saw exports worth US$ 3.2 billion in 2021. Exports saw a massive jump of 84.2

19. Ragip Soylu, "Turkish armed drones used against Armenia, Azerbaijan confirms", *Middle East Eye*, October 5, 2022, at https://www.middleeasteye.net/news/armenia-azerbaijan-conflict-turkey-drones. Accessed on March 30, 2022.
20. "Factbox: Turkey's Bayraktar TB2 combat drones sales", Reuters, November 10, 2021, at https://www.reuters.com/world/middle-east/turkeys-bayraktar-tb2-combat-drones-sales-2021-11-10/. Accessed on March 30, 2022.
21. Ibid.
22. "Turkey's Bayraktar TB2 drones enable swift, precise victory against YPG/PKK in Syria's Afrin", *Daily Sabah*, April 19, 2018, at https://www.dailysabah.com/war-on-terror/2018/04/19/turkeys-bayraktar-tb2-drones-enable-swift-precise-victory-against-ypgpkk-in-syrias-afrin. Accessed on March 30, 2022.

per cent in January 2022 and reached US$ 306.811 million, compared to the previous year.[23] The head of Turkish Defense Industries, İsmail Demir, claimed that the country is looking at a business of "over US$ 4 billion for 2022."[24] Africa has been one of the best and most successful markets for the Turkish defence industry to date. There is a mammoth increase of 700 per cent in exports from Turkey to Africa, from US$ 41 million in 2020 to US$ 328 million in 2021, "making it the fifth largest market after North America with US$ 1.56 billion, the Commonwealth of Independent States (US$411 million), the Middle East (US$ 381 million), and the European Union (US$ 338 million)."[25]

The success of the Bayraktar drones in Ukraine has helped the country spread the word fast and attract demand for drones from many other countries. The manufacturer claims to have received orders from countries like Iraq, Kyrgyzstan, Poland, Niger, Morocco, Qatar, Albania and Pakistan. Baykar Technology, the manufacturer, has started developing the next generation, the TB3 drone. The company is looking into a bigger market after its success in Ukraine. Largely, Asian countries are at the top of their marketing team's list. In a report, Haluk Bayraktar, the CEO of Baykar Technology, claims that the company will provide the countries that are not interested in purchasing Chinese drones—due to political and strategic differences—with a viable and good alternative. The CEO also looks forward to having a deal in place with Japan, whose "Izumo-class

23. Kamer Kurunç, "Turkish Defence Industry Exports Skyrocket in January", *Turkish Defence News*, at https://www.turkishdefencenews.com/turkish-defence-industry-exports-skyrockets-in-january/. Accessed on March 26, 2022.
24. İbrahim Sünnetci, "Turkish Defense & Aerospace Industry Starts 2022 with Record Increase in Exports! Turkey's Arms Sales to Africa Continues Upward Trend in January 2022", *Defence Turkey*, issue 112, February 2022, at https://www.defenceturkey.com/en/content/turkish-defense-aerospace-industry-starts-2022-with-record-increase-in-exports-turkey-s-arms-sales-to-africa-continues-upward-trend-in-january-2022-4974. Accessed on March 26, 2022.
25. José María Martín, "Turkey exponentially increased arms exports to Africa in 2021", *Atalayar*, December 10, 2021, at https://atalayar.com/en/content/turkey-exponentially-increased-arms-exports-africa-2021#:~:text=Turkey%20has%20exported%20%242.793%20billion,last%20year's%20figures%20for%202020. Accessed on March 26, 2022.

platforms" seem to be a good fit for the TB3 drones.[26] The rising demand for Bayraktar drones could spark a drone race between the receiving countries and their adversaries. However, the impact of the TB2 drone is such that Western competitors see it as the "Kalashnikov of the 21st century!"[27]

INDIA'S CONCERN

The Pakistan Air Force has released a video that shows the induction of these Turkish drones into their arsenal.[28] When the country is facing severe financial woes, Bayraktar drones seem to be a cheap and effective alternative for Pakistan's defence and, in some circumstances, offence. Drones and Pakistani forces have had a profound relationship, and Pakistan has been using drones for surveillance purposes, targeting Indian assets. In such a scenario, the acquisition of these Bayraktar drones is of major geopolitical concern to India. Although India has progressively developed a strong defence strategy against drones, India requires to pay closer attention to Pakistan's gaining ground in this rising drone race.

At such a juncture, India must pay closer attention to the deficits in its drone and anti-drone programmes. The 2020 report by the Comptroller and Auditor General on the armed drone programme—Rustom—has already slammed the UAV projects, and noticed faults in its planning and standard operating procedures.[29] There are great hopes for the Ghatak UAV, an indigenous Indian stealth drone that might be introduced to the arsenal by 2025. The Israeli UAVs Heron,

26. Sinan Tavsan, "Turkish drone success in Ukraine sets stage for Asia roadshow", *Nikkei Asia*, March 8, 2022, at https://asia.nikkei.com/Business/Aerospace-Defense/Turkish-drone-success-in-Ukraine-sets-stage-for-Asia-roadshow. Accessed on March 30, 2022.
27. Agence France-Presse, "The Role of Turkish Drones in Ukraine's War", *NDTV*, March 2, 2022, at https://www.ndtv.com/world-news/the-role-of-turkish-drones-in-ukraines-war-2799563. Accessed on March 30, 2022.
28. "Pakistan has Turkey's Bayraktar TB2 drone to wreak havoc on Russian army", *Hindustan News Hub*, March 11, 2022, at https://hindustannewshub.com/world-news/pakistan-has-turkeys-bayraktar-tb2-drone-to-wreak-havoc-on-russian-army-revealed-like-this/. Accessed on March 20, 2022.
29. Snehesh Alex Philip, "Another lesson for India from Ukraine: DRDO must get its act together & get along with military", *The Print*, March 18, 2022, at https://theprint.in/opinion/brahmastra/another-lesson-for-india-from-ukraine-drdo-must-get-its-act-together-get-along-with-military/877998/. Accessed April 27, 2022.

Heron II, and Heron TP, which are MALE UAVs similar to the TB2, make up the majority of India's current drone inventory. India has leased Israel's Heron TP drones, although it's alleged that these models can't be weaponised.[30] These drones are being upgraded and weaponised under 'Project Cheeta'. Other indigenous drones, such as the Nishant and its variant Panchi, are being developed by the Aeronautical Development Establishment; however, they are primarily intended for surveillance. The Indian Navy has a few US-made unmanned aerial vehicles (UAVs), such as the MQ-9B Predator drones. The question remains whether this adequately prepares us for the fast-paced drone race.

The biggest lesson for India from the Ukraine crisis would be to strengthen India's self-reliance on the domestic defence industry. The growth of the Turkish defence industry indicates the advent of newer players in the defence suppliers' group. This must be handled with caution and utmost seriousness. The Indian defence industry has progressed to becoming a supplier of critical arsenals to different countries. India must draw decisive lessons from both Ukraine and Turkey and incentivise the domestic defence research and manufacturing industries to scale up to meet global levels and contribute to India's military dominance.

30. Raghav Bikhchandani, "Heron, Searcher, Sea Guardian, SWITCH—the many UAVs that make up India's drone arsenal", *The Print*, August 6, 2021, at https://theprint.in/defence/heron-searcher-sea-guardian-switch-the-many-uavs-that-make-up-indias-drone-arsenal/709670/. Accessed on April 27, 2022.