

BRIEF

DRONE-CENTRIC WARFARE

RUSSIA'S WAR IN UKRAINE SERIES 2
NO. 7

| MYKHAILO SAMUS |

In December 2024, Major Robert 'Madyar' Brovdi, a key figure in Ukraine's drone warfare development, announced that his strike drone regiment would become a separate uncrewed systems brigade within the Armed Forces of Ukraine (AFU). Since 2022, Ukraine's drone capabilities have expanded rapidly. Over a million drones have now been deployed. But this is not simply a question of numbers—the AFU has embraced a fully drone-centric military strategy.

AN ASYMMETRIC DOCTRINE

Ukraine cannot match the mass deployment of overwhelming numbers of troops and weapons that Russia relies on. Instead, it has adopted an asymmetric military doctrine that focuses on technological superiority and innovative combat approaches, aiming to offset Russia's numerical advantage with advanced capabilities and the efficient use of limited resources. Russia has

Advanced command and tactical awareness systems are essential components of the AFU's drone-centric approach

tried to match this approach, but sanctions and the overly centralised nature of the Russian way of war have been obstacles, allowing Ukraine to retain its asymmetric advantages.

Ukraine's doctrine is centred on a network-centric warfare model, integrating weapons, intelligence systems, and command infrastructure into a unified information network.¹ The goal is to shorten the kill chain—the process from target detection to engagement. Intelligence must locate enemy

targets, relay coordinates to command centres, and pass strike orders to combat units in real time. Battlefield victory hinges on whose kill chain is faster.

Drones play a key role in this model, serving as reconnaissance tools, strike platforms, and even communication relays for electronic warfare. While the quantity of drones matters, it is their integration into Ukraine's kill chain that is decisive. In this respect, they have become force multipliers that amplify combat efficiency.

THE DIGITAL BACKBONE

Advanced command and tactical awareness systems are essential components of the AFU's drone-centric approach. The AFU employ a cutting-edge command and control system known as the *Delta* Situational Awareness and Battlefield Management System.² Developed by Ukrainian companies and volunteer organisations, *Delta* serves as a critical tool for enhancing operational efficiency. It fuses data from a wide network of stakeholders and sources, including combat units, sensors, intelligence assets, surveillance satellites, and geolocated drone feeds, providing comprehensive situational awareness and allowing for real-time battlefield coordination. *Delta* consolidates and maps battlefield intelligence, including visual data on enemy assets. Its digital interface, accessible on any electronic device from laptops to smartphones, displays a comprehensive operational picture. It thus supports operational planning, unit coordination, and secure dissemination of enemy force locations.

The Ukrainian government has authorised the hosting of the system in a secure cloud infrastructure outside Ukraine to ensure resilience against Russian cyber and missile threats. Cybersecurity is ensured through a comprehensive approach that includes multi-layered infrastructure protection, data encryption, real-time monitoring, multi-factor authentication, and regular security audits. Intrusion detection systems, artificial intelligence (AI), and machine learning are used for threat analysis, while cloud solutions safeguard against DDoS attacks. User training and access control minimise human-related risks, and a 'zero trust' policy combined with data redundancy ensures system resilience.³ Collaboration with NATO, the EU, and international cyber platforms provides access to advanced cybersecurity technology and threat intelligence, while penetration testing, automated threat analysis, and continuous AI algorithm upgrades enable rapid responses to attacks, maintaining a high level of cybersecurity for the *Delta* system even under the most challenging conditions.⁴

DRONES AND STRUCTURES

Delta is one component of the AFU's unified matrix for reconnaissance, control and destruction of the enemy. Drones are another central element of this matrix. The AFU employs drones for a wide range of combat tasks, including reconnaissance, target acquisition, unit coordination, direct strikes, remote mining, and counter-drone operations. While such capabilities are also emerging in other advanced militaries, the AFU has elevated drones from a supporting role to a central operational asset. The large-scale deployment of thousands of drones across the battlefield creates an integrated combat network. These drones collect, relay, and act on real-time battlefield intelligence, seamlessly connecting reconnaissance data with strike capabilities. This approach implements the kill chain through a unified combat matrix, giving the AFU an engagement speed advantage over an enemy that relies on massing strength and power.

The AFU's drone-centric approach not only requires vast numbers of drones, but also the transformation of operational philosophy, organisational structures, and strategic doctrines. In 2023, the AFU became the first military organisation to create special UAV strike companies in combat brigades and as separate combat groups—a total of 60 units altogether. This has allowed for the use of various types of drones to destroy enemy targets under a drone-centric doctrine that prioritises quality, adaptability and efficiency. The creation of these companies marked the beginning of the organisational and doctrinal modernisation of the AFU in its adaptation to the new technological realities on the battlefield. Over time, some companies have been restructured into drone strike battalions, and the most effective battalions further expanded into regiments. The 'Madyar's Birds' drone strike regiment, in which Robert 'Madyar' Brovdi serves, took a leadership role in developing drone-centric doctrine, and evolved into a full-fledged drone strike brigade.

On 25 June 2024, the President of Ukraine signed a decree establishing the Unmanned Systems Forces (USF) of the AFU. The USF are the world's first independent armed forces branch to deploy uncrewed aerial vehicles, ground robotic

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systems, and maritime surface and subsurface drones in a wide range of missions.⁵ These forces integrate cutting-edge technologies with modern asymmetric warfare approaches. As the USF state, "our mission is to transform the doctrine of warfare within the AFU, achieving a scenario where robots lead the fight, minimising the role and exposure of human personnel."⁶

MARITIME DRONES

Ukraine's advancements in maritime drone technology have forced the Russian Black Sea Fleet to shift its operational posture. With the loss of its traditional navy, Ukraine has used

maritime drones to turn the tables and compel the Russian fleet to retreat to the eastern Black Sea: the Russian fleet now avoids the western Black Sea entirely. Ukraine has developed multiple classes of maritime drones, both surface and subsurface.⁷ These were initially funded by volunteer contributions and later supported by the budgets of the Ministry of Defence, security agencies, and intelligence services.

The Ukrainian drones *Magura*, *Marichka*, and *Sea Baby* are known to have been used against Russian forces in the Black Sea.⁸ Various configurations of the advanced *Toloka* underwater drone have also been developed, including the TLK 1000 with a range of 2000 kilometres and a payload of up to 5000 kg of explosives.⁹ Its guidance system includes passive sonar for the identification and direction finding of underwater and surface objects using a system of hydrophones. The performance and effectiveness of these maritime drones have been continuously improved. They have caused damage not only to the vessels of the Black Sea Fleet, but also to basing sites and infrastructure, such as the Kerch Bridge.

The use of drones, including ground-based systems, will continue to expand across all operational domains

In terms of organisational and doctrinal changes, the Ukrainian Navy has created a naval drone brigade, which is the first naval combat unit at this level to be armed with drones. However, maritime drones are used not only by the Ukrainian Navy, but also by the Security Service of Ukraine and the Defence Intelligence of Ukraine with close coordination at the operational level. The process of concentrating under the USF drone doctrine and tactics development, and force generation for the various branches of the AFU (including the Navy) and security and intelligence services has already begun.

DRONES AND AI

The latest development in Ukraine's military drone operations is the integration of AI technologies. AI enables automated detection

and classification of battlefield targets, providing operators and commanders with ready-made decisions for engaging the enemy. It streamlines the processes of identifying enemy targets, determining their coordinates, relaying this data to commanders, issuing decisions to destroy targets, and transmitting those orders to strike assets. In modern warfare, minimising these cycles is critical. The deployment of AI in drone operations accelerates decision-making processes, ensuring greater efficiency and effectiveness of the armed forces as a unified reconnaissance-strike system. AI also ensures the success of some drone missions even when communication with the operator is lost.

The potential drastic shortening of the kill chain through AI thus marks a significant step forward in network-centric warfare. The AFU have already fielded their first AI-powered drone, the *Saker Scout*, which autonomously detects and records the coordinates of enemy vehicles, including camouflaged ones, and instantly transmits this intelligence to command posts for rapid action.¹⁰ At present, the decision to engage a target is determined by the operator. However, it is evident that future AI systems may be capable of autonomously executing strikes on enemy targets. While this advancement raises ethical concerns, particularly regarding the potential for misidentification of civilian or non-combatant targets, these challenges are expected to be addressed through advancements in machine learning and the continuous refinement of AI algorithms. Enhanced precision and reliability in target identification will be critical to ensuring the operational effectiveness and accountability of autonomous strike systems.

THE NUMBERS GAME

The sheer scale of the deployment of drones on the battlefield indicates their critical importance for the AFU. In the first 11 months of 2024 alone, the Ministry of Defence (MoD) of Ukraine delivered over 1.2 million drones of various types. This includes over 40 000 multirotor reconnaissance drones, more than 12 000 of which are equipped for night operations. Additionally, the military received 5 000 fixed-wing reconnaissance UAVs such as the *Shark*, *Hor*, *Furia*, and others.

Moreover, over 6 000 deep-strike attack drones were supplied throughout 2024, including models like the An-196 *Lyutyi*, *Firepoint*, and others. The MoD allocated approximately \$1.2 bn in 2024 for drone procurement, with about \$480 m specifically dedicated to long-range drones.¹¹

Looking ahead to 2025, Ukraine plans to further expand its drone procurement volumes. According to the MoD, drone production contracts worth \$3.58 bn have already been secured for 2024-25, signalling a significant increase in the number of drones integrated into the AFU's operational structure.¹²

The year 2025 is set to be pivotal in developing the USF as a central branch of the AFU, spearheading the construction of fully drone-centric military forces. The USF will focus on refining doctrine, organisational structures, command systems, logistical support, budgeting and procurement. The use of drones, including ground-based systems, will continue to expand across all operational domains.

Key challenges persist, however, including inefficiencies in the defence industry, budget constraints, and management bottlenecks within the AFU. Resolving these issues will be crucial for advancing drone projects and enhancing operational capabilities.

Achieving this vision requires ongoing revolutionary changes at the organisational, doctrinal, tactical, and technological levels. The kill chain of the AFU must be as short as possible, and the reliance on soldiers in direct combat must continually decrease. While the rapid adoption of drones by the AFU may not only have been driven by the goal of accelerating the kill chain but also by shortages in artillery ammunition and personnel, the future of the AFU nevertheless lies in further advancing automation and robotic warfare. The modern battlefield is evolving rapidly in this direction, and, for Ukraine, there is no alternative but to fully exploit this trend.

ENDNOTES

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ABOUT THE AUTHOR

MYKHAILO SAMUS

Mykhailo Samus is Director of the New Geopolitics Research Network and Co-founder of the Consortium for Defence Information in Ukraine



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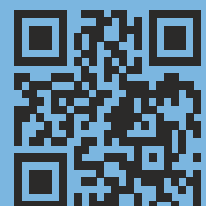
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INTERNATIONAL CENTRE FOR DEFENCE AND SECURITY
63/4 NARVA RD., 10120 TALLINN, ESTONIA
INFO@ICDS.EE

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