SERPENS CENTER FOR INTERNATIONAL SECURITY

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IN THIS EDITION

Ukraine Conducts First Reported Frontline Casualty Evacuation by Heavy Aerial Drone

Russia's Rassvet Satellite Network Suffers Orbital Setbacks but Remains a Growing Battlefield Threat

GEREON UGV Completes 46 Frontline Missions

Six Ukrainian Companies Begin Serial Production of Miniature Turbojet Engines

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OCTOBER 2026

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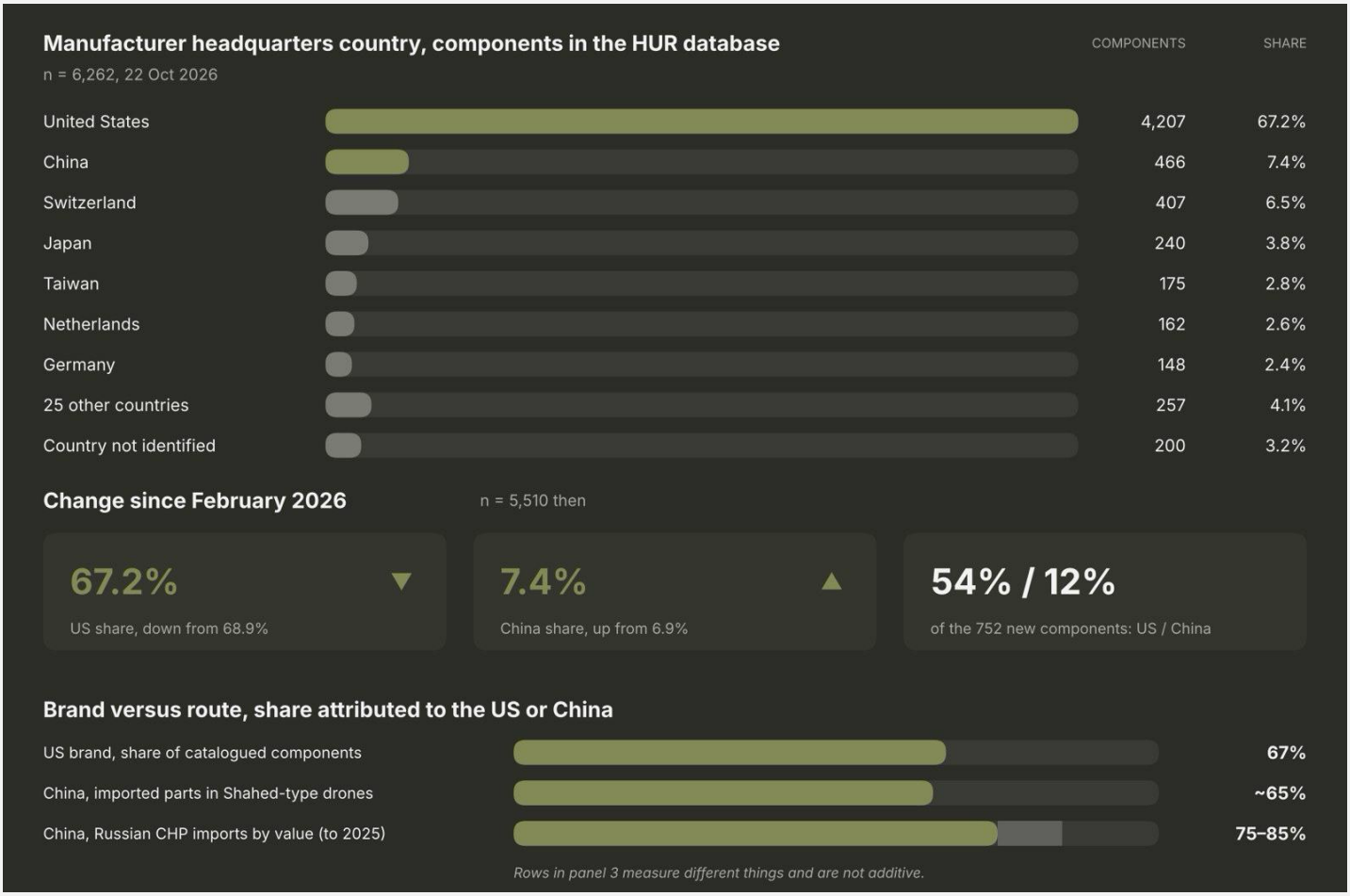
FOREIGN ELECTRONICS IN RUSSIAN WEAPONS: THE BRAND IS AMERICAN, THE ROUTE IS CHINESE

Ukraine's Defense Intelligence continues to document foreign components recovered from Russian weapons through its **War&Sanctions portal**. As of October 22, the database contained 6,262 components across 211 weapon samples: the average remains close to 29 identified components per analyzed weapon. Recent additions to the database **include systems such as the new Filin cruise missile** and the **upgraded Geran-4**.

At the level of manufacturer origin, Western technology still dominates. Roughly two-thirds of components catalogued by HUR are linked to U.S.-headquartered companies. However, this does not mean they reach Russia directly from the United States.

Direct exports of war-critical goods from Germany, the Netherlands, Czechia and Poland fell sharply after February 2022, while China's share of Russia's imports of these goods rose from roughly 25–30% before the full-scale invasion to 75–85%. This suggests that the origin of the technology and the route by which it reaches Russia increasingly diverge. The continued presence of Western-brand electronics in Russian weapons, alongside large volumes of processor and integrated-circuit trade through China and Hong Kong, points to resale and re-export through intermediaries rather than direct Western supply.

The result is a dual dependency: Western technology remains embedded in Russian weapons, while China has become the principal channel — and increasingly the source — through which critical components reach Russia.



*Foreign components in Russian weapons, by manufacturer headquarters and supply route. Serpens Center calculations based on open-source reporting. (Sources: **HUR War&Sanctions portal**, **HUR via Slovo i Dilo**, **HUR via Mezha**, **KSE CHP Imports Tracker**)*

105	76.2%	10.48%
TOTAL COMPONENTS	UNITED STATES	CHINA

COUNTRY	MANUFACTURERS	COMPONENTS	SHARE
United States	Texas Instruments / National Semiconductor, CTS, Onsemi, Monolithic Power Systems, Qorvo, Analog Devices, Diodes Incorporated / Zetex, Microchip, Abracon	80	76.20%
China	Yuell Electronic, Yantel, Shanghai Leiditech, Shenzhen Huazhimei Semiconductor, WCH	11	10.48%
Germany	Infineon Technologies	2	1.90%
Japan	Renesas / Intersil	1	0.95%
Taiwan	MediaTek / Richtek	1	0.95%
Netherlands	STMicroelectronics	1	0.95%
Unidentified	Components with unidentified manufacturer	9	8.57%
Total	—	105	100%

*Breakdown of 105 identified components in the Geran-4 onboard computer by country of origin. (Source: **Militarnyi**, based on analysis by the **1230th Athena Engineering and Technical Regiment**)*

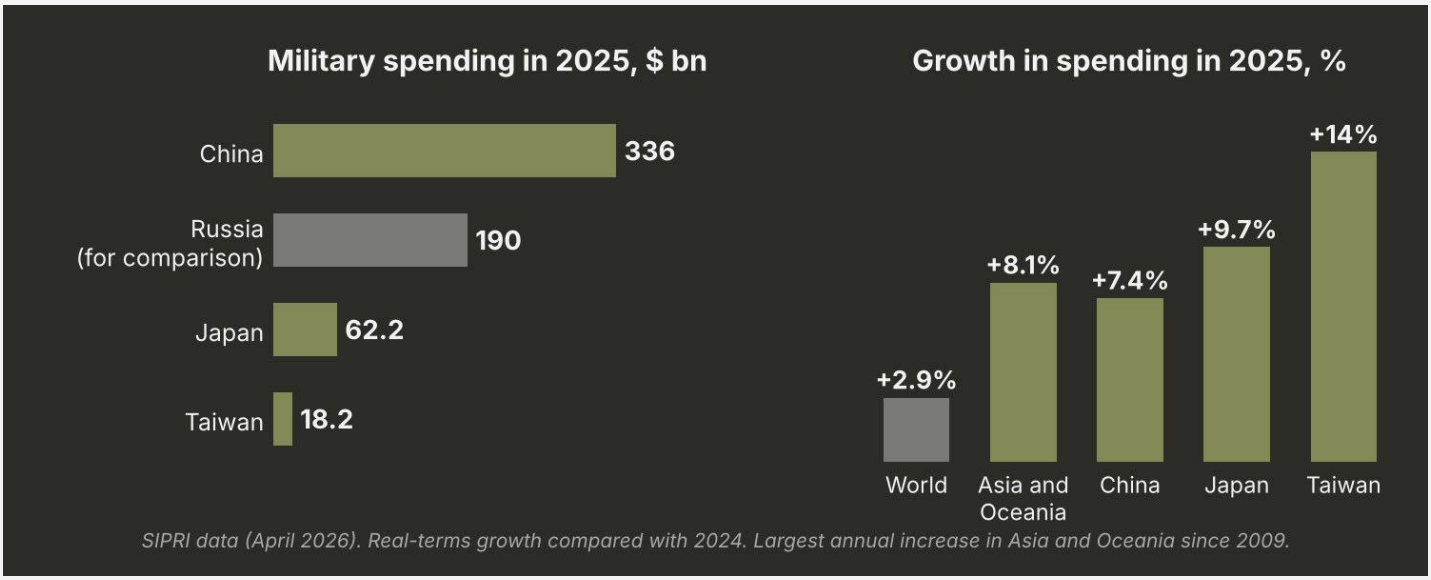
THE REARMAMENT OF EAST ASIA: HOW IT IS LINKED TO RUSSIA'S WAR AGAINST UKRAINE

Military spending in Asia and Oceania reached $681 billion in 2025, up 8.1% from a year earlier and the largest annual increase since 2009, according to **SIPRI**. China spent $336 billion (its 31st consecutive year of growth), Japan $62.2 billion (+9.7%, 1.4% of GDP, the highest share since 1958), and Taiwan $18.2 billion (+14%, the largest increase since at least 1988). South Korea is **preparing** a record defense budget for 2027 of about 71.8 trillion won, 9% more than in 2026.

This buildup is usually explained by China and uncertainty about U.S. support.

But it is closely intertwined with Russia's war against Ukraine. North Korea and China feed the Russian war machine while at the same time intensifying the very threats that Tokyo, Seoul and Taipei are arming against. The region's arsenals and factories are becoming a resource that both theaters lay claim to, and Ukraine's experience is a commodity that Asia wants to buy. We see four such links.

1. North Korea: The War in Ukraine as a Testing Ground for a Future Threat to Korea and Japan



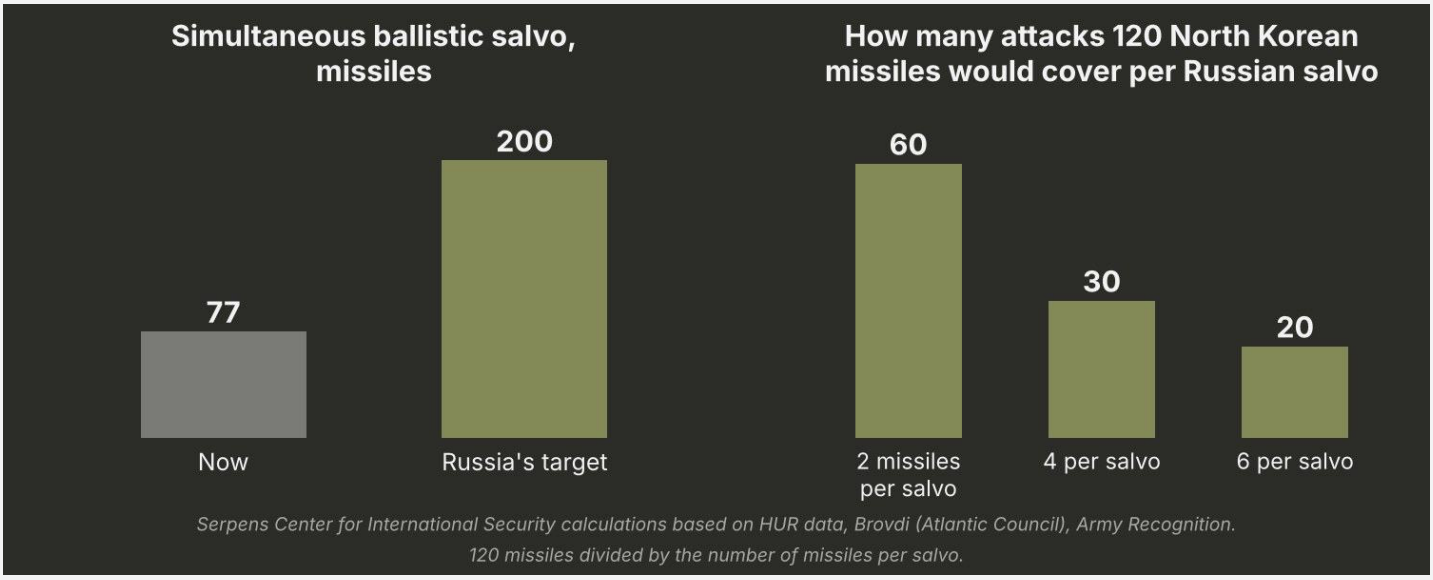
*Military spending in China, Japan and Taiwan in 2025, with Russia shown for comparison, and annual growth in defense expenditure across Asia and Oceania. (Source: **SIPRI**)*

North Korea is the point where the two theaters connect directly. According to an assessment by Ukrainian intelligence, cited by **Defense News**, Pyongyang has handed Russia about 4 million artillery shells and 148 KN-23/KN-24 ballistic missiles. The **estimate** of South Korea's Defense Intelligence Agency is even higher: more than 15 million rounds of artillery ammunition and more than 16,000 troops since October 2024. Ukrainian intelligence also reported the deployment in Voronezh Oblast of a North Korean missile unit (~90 personnel) that is expected to receive up to 120 **missiles** and six launchers. Not all of these claims have been independently confirmed.

For Russia, these missiles are a way to overwhelm Ukrainian air defenses.

According to Robert Brovdi, commander of the Unmanned Systems Forces, Moscow seeks to increase its simultaneous ballistic salvo from 77 to 200 missiles.

For Pyongyang, meanwhile, this is an investment in a future war in Asia. According to **Chatham House**, its missiles are being tested against Western air defenses, and their accuracy has reportedly improved from 1–3 km early in the war to 50–100 m by early 2025. North Korea is gaining combat experience with drones and electronic warfare, and possibly Russian **technology** and money – reportedly up to $22 billion. North Korean workers, according to a CSIS and Bush Institute report, are gaining drone-production experience in Alabuga. These are precisely the threats that Seoul and Tokyo build into their defense budgets, and Chatham House explicitly advises allies to rework missile defense and counter-drone defenses in light of Ukraine's lessons.



*The arithmetic of a North Korean salvo. Calculations by Serpens Center for International Security. (Sources: **Ukraine's HUR via Army Recognition**, **Atlantic Council**.)*

2. Allied Arsenals and Factories: A Shared Resource, but Not for Ukraine

Japan, South Korea and Taiwan **hold** stocks of Patriot interceptors, and U.S. Ambassador to NATO Matthew Whitaker acknowledges that global demand for them exceeds production capacity. However, the buildup in Asia makes these stocks less available, not more. Because of the war with Iran, the U.S. moved THAAD **interceptor** missiles from South Korea to the Middle East, so Asian allies have every reason to keep their own reserves at home. Meanwhile, on October 15, **CNN** reported that Ukraine has run out of Patriot missiles.

At the same time, it is Asian rearmament that creates production capacity Ukraine may need. Mitsubishi Heavy Industries is the only non-American licensed producer of the PAC-3 (about 30 missiles a year), and Japan is the only producer of gyroscopes for the PAC-2. In November 2025, Tokyo for the first time transferred finished PAC-3 missiles to the U.S., but on the condition that they not **reach** third countries. On April 21, 2026, the Takaichi government scrapped the rule limiting Japan's defense exports to five non-lethal categories, but, as before, weapons can be transferred to countries at war only in **exceptional** cases. South Korea, by law, does not supply lethal weapons to countries in a state of war, and in August 2026 it again limited itself to humanitarian and reconstruction aid to Ukraine. At the same time, in 2023 hundreds of thousands of Korean 155 mm shells reached Ukraine via the U.S.

3. China: The Driver of Asian Rearmament and the Rear Base of Russia's Defense Industry

China is the main reason Japan and Taiwan are setting spending records, and at the same time a key supplier to Russia's defense sector. It supplies not **finished** weapons but dual-use goods: drone components, machine tools, gunpowder precursors, and commercial drones. According to customs documents reviewed by the U.S. and UK governments, the state-owned Jilin Chemical Fiber Group this year shipped 46 tons of a carbon-fiber precursor to Alabuga-Volokno, a subsidiary of Rosatom, declaring the cargo as civilian synthetic fiber. According to **expert** David Albright, that would be enough for roughly 1,300 long-range strike drones. The Chinese embassy rejects the accusations. Sanctions against individual firms have so far not changed the picture.

4. Asia's Demand for Ukrainian Experience

The only channel where Ukraine acts not as a petitioner but as a supplier is drones. Japan produces about 1,000 military drones a year, and in June 2026 the ruling LDP **approved** a target of about 80,000 a year by 2030, explicitly citing the lessons of the war in Ukraine. In April, Japan's Terra Drone signed a partnership and investment agreement with Ukraine's Amazing Drones on the Terra A1 interceptor, and the Japan–Ukraine Drone Cluster alliance was launched in July, with a Taiwanese manufacturer already confirmed as a participant. Japan has also allocated $14.7 million for non-lethal equipment for the Ukrainian Armed Forces through NATO's PURL mechanism.

Channel	Impact on Ukraine	Recommended response
North Korea–Russia axis	More missiles and shells for Russia; North Korean weapons are improved on Ukrainian targets	Share data on North Korean weapons with Tokyo and Seoul as intelligence on a threat to themselves; exchange countermeasure experience
Allied arsenals and factories	The region's air-defense stocks stay at home; Japanese and Korean rules prohibit direct deliveries	Seek indirect schemes via U.S. and European partners; negotiate licensed production of components
China	Steady supply of components for Russian drones	Give partners evidence on specific exporters and logistics hubs for sanctions
Asia's demand for drones	A chance to gain investment, electronics and production capacity	Develop joint projects with Japan and Taiwan, trade combat experience for funding and components

East Asia's rearmament is not a story parallel to the war in Ukraine. It is partly fueled by the same Moscow–Pyongyang–Beijing axis that supplies Russia with shells, missiles and drone components.

So for Kyiv, Tokyo, Seoul and Taipei are not competitors for the West's attention but partners with a shared threat, to be addressed in the language of their own security.

RUSSIA REBUILDS STRATEGIC ARMORED AND ARTILLERY RESERVES AT STORAGE BASES

Russia has begun refilling military storage bases with newly produced and refurbished armored vehicles and self-propelled artillery, reversing the depletion seen during the first years of the full-scale invasion. **OSINT monitoring identified** renewed deliveries of T-90M tanks, BTR-82A armored personnel carriers, BMP-3M infantry fighting vehicles, possible BREM armored recovery vehicles, as well as several types of self-propelled artillery. The **Critical Threats Project** independently assessed that Russia is replenishing equipment stocks across at least five storage bases, although it cautioned that the observed buildup still represents only a partial reconstitution of Russia's prewar armored fleet.

The clearest example is the 349th Central Tank Storage Base in Topchikha, Altai Krai. **Approximately 78 refurbished T-72B3 tanks** and more than 100 BMP-2 infantry fighting vehicles arrived there beginning in June 2026, with subsequent satellite imagery indicating that the base continued to receive additional vehicles.

The increase is visible in comparative satellite imagery from October 2025 and October 2026, with analysts estimating that several hundred additional vehicles may have arrived in recent weeks.

Some of the replenishment involves newly manufactured equipment rather than only restored Soviet-era stocks. At the 22nd Central Tank Reserve Base in Buy, Kostroma Oblast, roughly 500 km from the borders of Estonia and Latvia, analysts identified new T-90M tanks and BTR-82A armored personnel carriers alongside BMP-3s and possible recovery vehicles between late 2025 and October 2026. Russia is also storing newer artillery systems: the 374th Mobilization Deployment Support Center in Karelia, roughly 185 km from Finland, has reportedly received 2S43 Malva and 2S44 Giatsint-K self-propelled howitzers, while the 80th GRAU Arsenal has accumulated additional 2S19 Msta-S systems.



*Satellite imagery of Russia's 349th Central Tank Storage Base in Topchikha, Altai Krai, showing a major increase in stored armored vehicles between 2025 and 2026. (Source: **Radio Free Europe/Radio Liberty**; satellite imagery: **Planet Labs**)*

The trend suggests that Russia is no longer directing every available modernized vehicle immediately to combat units and is instead beginning to rebuild a mobilization and strategic equipment reserve.

One likely enabling factor is the changing character of frontline operations: Russian forces increasingly rely on small infantry infiltration groups and motorcycles or light vehicles rather than large mechanized assaults, reducing immediate demand for tanks and IFVs at the front.

At the same time, Russian factories continue producing new platforms and repairing damaged ones, allowing some equipment to accumulate in storage.

Moscow may be preserving mechanized capacity for future conditions in which larger armored formations could again become useful, whether in Ukraine or in a broader future confrontation.

UKRAINE'S TENCORE AND CANADA'S DOMINION DYNAMICS TO PRODUCE TERMIT UGVS IN CANADA

Ukrainian defense company TENCORE and Canada's Dominion Dynamics will launch production of the TerMIT unmanned ground vehicle in Canada for Ukraine and NATO partners. The companies signed a **memorandum of understanding at the AUSA 2026** defense exhibition in Washington. The agreement covers localization of TerMIT production in Canada, technology transfer from TENCORE, and training of Canadian specialists ahead of full-scale manufacturing.

A key element of the partnership is integration of Dominion Dynamics' AuraNet autonomous control and navigation system into the Ukrainian platform. **Dominion describes AuraNet as** an autonomy and command-and-control stack designed to fuse telemetry, imagery, signals and other battlefield data into a common operating picture. **The Canadian company says initial TerMIT** production is targeted for 2027, while a separate Arctic-hardened version is planned for Canadian operations and potential export to NATO allies.



TerMIT unmanned ground vehicles. (Source: **TENCORE***)*

The deal builds on a platform that has already been deployed at scale in Ukraine. TENCORE has delivered more than 5,000 UGVs to Ukrainian military units since 2024. **The company says Canadian production will allow battlefield feedback**, engineering changes, and manufacturing to operate as a continuous cycle outside Ukraine as well. The agreement also follows the September Canada-Ukraine declaration on defense cooperation, under which the two countries committed to jointly manufacture thousands of battle-tested drones and unmanned systems, with part of that output intended for Ukraine.

The partnership reflects a broader trend in which Ukrainian combat-proven unmanned systems are moving from domestic wartime production toward licensed and localized manufacturing inside allied defense industries. For Ukraine, this expands production capacity and supply-chain resilience; for Canada and NATO partners, it provides access to a platform already shaped by frontline use rather than a system developed solely through peacetime testing.

UKRAINE'S UNEX UGV CAN TOW ARTILLERY AND VEHICLES UP TO 10 TONNES

Ukraine's UNEX UGV, a Czech-Ukrainian unmanned amphibious ground platform, can tow artillery pieces and other wheeled vehicles weighing up to 10 tonnes, while simultaneously carrying ammunition or other cargo on the vehicle itself. **The platform can carry up to 1.7 tonnes** on land and around 1.25 tonnes in water, according to the manufacturer.

UNEX is a fully electric amphibious platform designed to operate across mud, swamps, sand, ice, and water obstacles without additional preparation. **Ukraine's Ministry of Defense approved** the system for operational use in 2025, while the manufacturer states that its wide low-pressure tires reduce ground pressure and improve mobility across soft terrain. The platform also incorporates programmable autopilot, electronic-warfare resistance, and remote-control systems.



UNEX UGV towing a towed artillery piece during field testing. (Source: **Militarnyi***)*

The newest configuration extends UNEX beyond conventional resupply missions into heavy unmanned logistics. A single vehicle can potentially deliver a towed artillery system together with its ammunition, recover damaged wheeled equipment, or transport heavy payloads without exposing a crew. Maximum range is up to 120 km and a top speed of around 20 km/h, depending on operating conditions and payload.

The platform is therefore notable not simply as another logistics UGV, but as an attempt to replace some functions traditionally performed by crewed tactical trucks and tractors. Its combination of amphibious mobility, heavy towing capacity and modular payloads could allow Ukrainian units to move guns, supplies, and equipment through areas where conventional vehicles face high risks from mines, FPV drones, or difficult terrain.



*UNEX UGV fitted with an air-defense payloads. (Source: **Militarnyi**)*

GEREON UGV COMPLETES 46 FRONTLINE MISSIONS BEFORE BEING DESTROYED

A GEREON unmanned ground vehicle operated by **Ukraine's Chervona Kalyna Brigade completed 46 frontline missions** over two months, far exceeding the roughly five missions operators considered a typical service life for this type of platform. UGV traveled hundreds of kilometers, transported nearly 25 tonnes of supplies, and evacuated two wounded soldiers before it was ultimately destroyed by a Russian strike on its shelter.

The GEREON was used primarily to deliver ammunition, food, and other supplies to positions where conventional vehicles faced a high risk from Russian FPV drones. **Individual missions typically lasted** 5–6 hours, while the longest lasted about a day and a half. During one sortie, the vehicle covered approximately 30 km, including a battery replacement at a neighboring unit, while one of its heaviest missions involved transporting around 800 kg of cargo — roughly 300 kg on the platform and another 500 kg in a trailer.

The vehicle required only one major repair during all 46 missions, after falling from a bridge into an anti-tank ditch and damaging part of its structure. Operators identified FPV drones as the primary threat to the system, while most terrain obstacles proved manageable. Operational feedback from the brigade **was continuously passed to ARX Robotics,** allowing the manufacturer to refine the platform based on frontline experience.

The case provides a concrete example of how UGVs are moving from experimental use toward sustained frontline logistics. In September, **ARX Robotics and DEUTZ produced another batch of GEREON UGVs** for Ukraine, expanding the platform's deployment. The system is designed to carry payloads of up to 500 kg and operate over distances of up to 40 km, making it suitable for resupply, casualty evacuation, and other high-risk missions where replacing soldiers with unmanned platforms can directly reduce personnel exposure.



*GEREON unmanned ground vehicle conducting a frontline logistics mission with Ukrainian troops. (Source: **ARX Robotics**)*

UKRAINE AND NATO DEVELOP AI MODELS FOR DRONE ATTACK FORECASTING AND ARTILLERY PLANNING

Ukraine and NATO have developed two artificial intelligence models designed to support battlefield decision-making: one forecasts Russian drone activity near the front line, while the other generates and evaluates options for artillery operations.

The systems, designated Model No. 13 and Model No. 32, were developed jointly by NATO's Allied Command Transformation (ACT) and the Armed Forces of Ukraine, with support from the NATO-Ukraine Joint Analysis, Training and Education Centre.

The models were presented during a three-day workshop in Vilnius, Lithuania, attended by NATO member-state and Alliance experts alongside Ukrainian military specialists.



*Official illustration accompanying the announcement of Ukraine–NATO AI models for drone forecasting and artillery planning. (Source: **Ministry of Defense of Ukraine**)*

Model No. 13 analyzes historical data, weather conditions, and the current battlefield situation to forecast enemy drone activity. It is designed to estimate the intensity, location, timing, and types of unmanned aerial vehicles likely to be employed near the line of contact. **Model has been tested against real-world datasets,** refined, and prepared for integration into the Ukrainian Armed Forces' situational-awareness systems.

Model No. 32 focuses on artillery planning. The decision-support tool processes mission requirements and operational constraints, including available weapon systems, ammunition, firing positions, and other relevant parameters. It first filters out infeasible options using logistical, ballistic, and engagement-zone constraints, then evaluates and ranks the remaining plans. The intended benefit is to reduce the time required to compare operational options and support more efficient fire planning.

The prototype has been delivered to Ukrainian stakeholders for testing and validation; wider deployment will depend on the results.

The initiative reflects a broader effort to deepen Ukraine-NATO cooperation on artificial intelligence and machine learning for defense applications. These models demonstrate two distinct uses of AI: anticipating adversary activity and assisting with the planning of friendly operations. Their operational value will depend on further validation, integration with existing military systems, and performance under real-world battlefield conditions.

Ukraine is also expanding international cooperation on defense AI. **The United Kingdom recently became** the first international partner to join Ukraine's Avengers Labs platform, enabling British defense companies to train AI models for unmanned systems using real battlefield data.

UKRAINE'S STRIKES INSIDE RUSSIA IN OCTOBER 2026



Ukrainian Long-Range Strikes Inside Russia, October 2026. (Source: Open-source reporting, Ukrainian military statements, and SCIS analysis. Locations are approximate; reported strikes do not necessarily indicate confirmed destruction.)

Throughout October 2026, Ukraine conducted at least 63 reported strikes against targets inside Russia, continuing its campaign against oil refineries, fuel infrastructure, and defense-industrial facilities. While these targets remained central to Ukraine's long-range strike strategy, October also saw sustained attacks on Russian radar stations, electronic-warfare systems, and drone-related infrastructure, suggesting an effort to weaken Russia's ability to detect incoming threats and conduct long-range attacks against Ukraine.

A notable development was the expanding use of Ukraine's domestically developed Neptune missiles against land targets. Ukrainian forces reportedly employed Neptune missiles alongside attack drones against the **Kamensky rocket-propellant plant** in Rostov Oblast, while the **Ukrainian Navy reported** using Neptune missiles against a Russian airbase. These operations highlight Ukraine's growing domestic precision-strike capabilities and its efforts to disrupt both Russia's military operations and the industrial infrastructure sustaining the war.

UKRAINE CONDUCTS FIRST REPORTED FRONTLINE CASUALTY EVACUATION BY HEAVY AERIAL DRONE

Ukrainian forces have carried out what the participating unit described as the first successful frontline casualty evacuation using a heavy-lift aerial drone. According to the **92nd Separate Assault Brigade's unmanned systems unit**, an infantryman from the 30th Separate Mechanized Brigade was wounded at a position that could not be safely reached by conventional vehicles or unmanned ground systems because of intensive Russian drone activity and mined terrain. Ukrainian troops instead used a heavy hexacopter developed by Gurzuf Defence, which had been provided by the manufacturer for the operation.

Specialists from the 92nd Brigade's unmanned ground systems company worked with the developers to adapt and stabilize the aircraft for carrying a person before the drone, operated by personnel from the 30th Brigade, successfully evacuated the wounded soldier. He survived and is now undergoing treatment and rehabilitation.

The operation builds on Ukraine's growing use of heavy UAVs for frontline logistics. Earlier this year, Pravda reported that **Gurzuf Defence's six-engine Ayudag-6** platform could carry roughly 70–90 kg and that the company was already considering casualty evacuation as one of its potential missions. **Gurzuf Defence** says its Heavy Shot family is currently used by more than 160 Ukrainian combat units for missions ranging from strike operations to logistics.



*Ukrainian forces evacuate a wounded soldier from the frontline using a heavy-lift hexacopter developed by Gurzuf Defence. (Source: **92nd Separate Assault Brigade's unmanned systems unit**)*

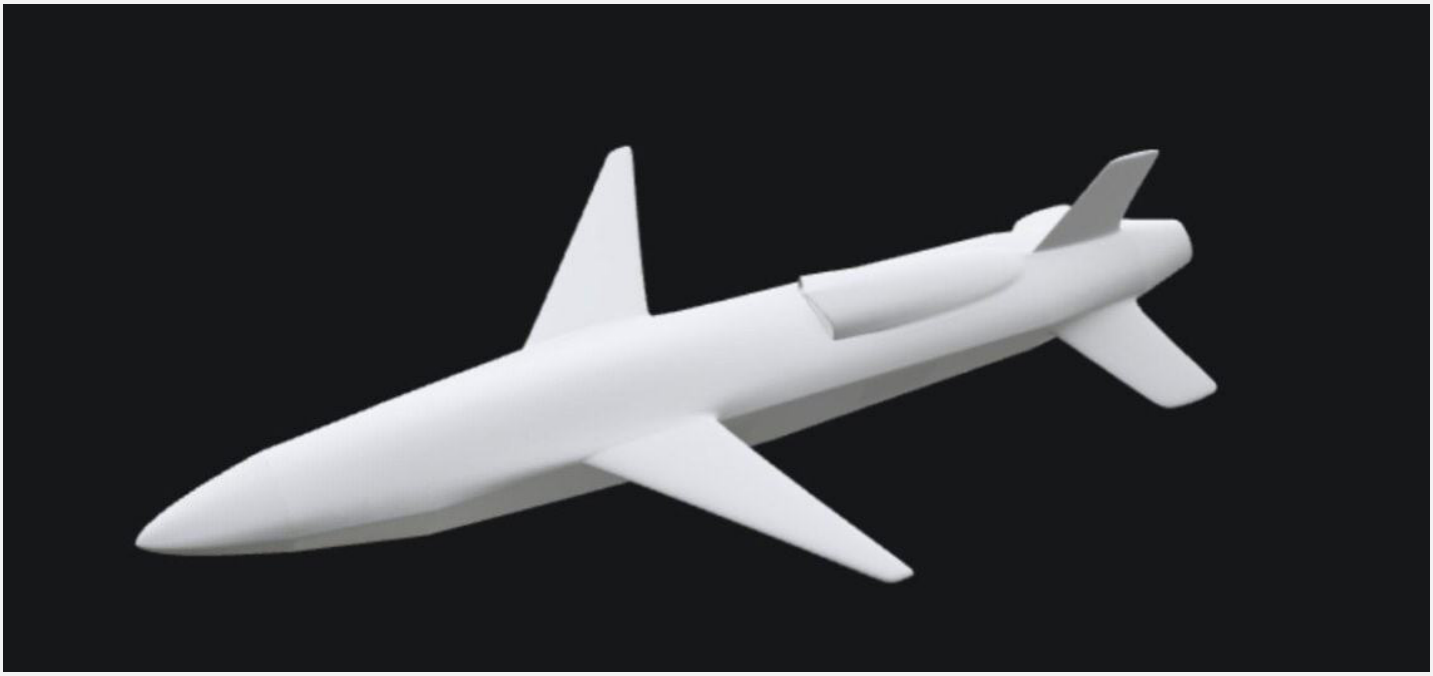
The first evacuation was followed by two further missions using a different platform. On 26 October, **Militarnyi reported** that the CODE 9.2 regiment had evacuated two severely wounded soldiers with SkyFall's StarGate over the preceding week, describing these as the second and third known cases worldwide. Ground transport could not reach either casualty. During one mission, StarGate flew nearly 30 km to the casualty and returned approximately the same distance with the wounded soldier aboard. According to the regiment, AI-based onboard navigation enabled the aircraft to continue despite GPS jamming.

StarGate is a purpose-built casualty evacuation platform with a medical-stretcher module, a stated payload capacity of up to 150 kg and a maximum speed of 105 km/h. Regiment commander Oleksandr Nastenko said CODE 9.2 plans to establish a dedicated medical aviation element within its medical company. These subsequent missions suggest that aerial casualty evacuation is moving beyond a single demonstration toward a repeatable capability where ground access is denied, although its wider viability will depend on aircraft availability, weather, electronic warfare and protection from enemy drones.

RUSSIA BEGINS USING NEW FILIN CRUISE MISSILE WITH UP TO 1,200 KM RANGE

Russia has begun using a new ground-launched cruise missile, Filin, against Ukraine, expanding the range of relatively low-cost long-range strike systems available to Moscow. According to Ukraine's **Defense Intelligence**, the missile entered operational use in late summer 2026 and has a stated range of 600–1,200 km, a maximum speed of up to 800 km/h, and can fly from very low altitude up to around 6 km. Depending on the variant, it carries a 50 kg or 100 kg warhead, including high-explosive fragmentation, penetrating, or thermobaric types. HUR's **War&Sanctions database** lists the missile's maximum take-off weight at approximately 210 kg, with a 3.5-meter fuselage and 3-meter wingspan.

The missile is produced by NPO Molniya, part of Russia's Tactical Missiles Corporation, and launched from a ground-based launcher using a solid-propellant booster. **Filin uses the Russian-made R500 turbojet engine,** the same engine family previously identified in the S-71K *Kover* and S-71M *Monokhrom* cruise missiles. Guidance reportedly combines a Chinese-made inertial navigation system with Russia's 16-channel Kometa anti-jamming satellite-navigation module, allowing the missile to operate in a contested electronic-warfare environment.



Russia's new Filin ground-launched cruise missile (Source: **Defense Intelligence of Ukraine***)*

The missile's onboard equipment **is manufactured by Russian company PLAZ**, which is also involved in production of the Harpiya UAV, with the two systems sharing similar component architecture and markings.

Its significance lies in its combination of long range, ground mobility, relatively small size, and low-altitude flight.

A maximum range of 1,200 km means that, depending on launcher location, virtually any region of Ukraine could potentially fall within reach, while low-altitude flight complicates detection and interception. The Filin therefore appears to fit a broader Russian effort to develop cheaper, serially producible jet-powered strike systems that sit between long-range attack drones and more expensive cruise missiles, allowing Moscow to increase strike volume without relying exclusively on higher-end weapons.

UKRAINE'S FIREFLY GUIDANCE KITS ENTER MILITARY SUPPLY

Firefly high-precision guidance kits **are already being supplied** to Ukrainian Defense Forces units, enabling conventional munitions carried by bomber drones to be converted into precision-guided weapons.

Jointly developed by the **Aerorozvidka NGO** and a unit of **Ukraine's Ministry of Defense**, Firefly is designed to improve the accuracy of drone-delivered munitions.

The manufacturer produces the guidance modules under license, focusing on industrial-scale manufacturing and the delivery of ready-to-use systems to military units.

The module consists of a body, wings and a tail section that corrects the munition's flight path. Its guidance system operates automatically from the drone, allowing the munition to adjust its trajectory after release. This approach is intended to increase strike precision without requiring the development of an entirely new weapon for every type of ammunition.



*Firefly FF85 guidance kit fitted to an OGB-1 munition. (Source: **Voyin-Info**)*

The manufacturer currently offers two versions- the smaller-diameter FF85 and the larger FF120. The FF85 is compatible with OGB-1 ammunition, 82 mm mortar rounds and the company's own munitions. The FF120 supports a broader range of payloads, including MOA-400 and MOA-900 munitions, 105 mm artillery shells and 120 mm mortar rounds. The company has also developed its own ammunition for use with the system.

One example is the KIL-9, a 9 kg penetrating high-explosive munition with a delayed-action fuze, designed to engage enemy field fortifications.

According to a company representative, the munition is intended to penetrate the roofs of standard field dugouts, which may consist of two embankments and an overlying layer of earth, before detonating after a delay.

The manufacturer noted that individual military units had previously developed similar solutions, but these were not available as standardized, factory-produced products at scale.

The transition to serial production is a significant step in the system's development. During prototyping and small-batch manufacturing, a substantial proportion of components were produced using 3D printing.

With the shift to mass production, the company began manufacturing plastic components through injection molding using thermoplastic processing equipment.

The reported cost of a guidance kit is **approximately $200**, with only a minor price difference between the FF85 and FF120 variants.

The manufacturer also offers to adapt the modules to ammunition already held by military units. For Ukraine, this adaptability could be particularly valuable- rather than requiring units to replace their existing ammunition stocks, the system can be tailored to available munitions. The availability of two form factors also provides flexibility across different payload types and operational requirements.

UKRAINE COMBINES KUB AND BUK SYSTEMS TO COUNTER RUSSIAN JET-POWERED DRONES

Ukraine's 156th Maksym Kryvonis Anti-Aircraft Missile Regiment has **demonstrated** a **hybrid air defense configuration** combining a Soviet-era Kub missile launcher with a Buk system's self-propelled firing unit to engage Russian jet-powered Shahed drones. According to the regiment, the pairing has helped address limitations in both systems and has been credited with destroying around 20 aerial targets, most of them Russian jet-powered drones.

The configuration takes advantage of the Buk firing unit's onboard radar to detect and track aerial targets, provide target illumination, and support the Kub launcher's engagement. This helps compensate for the Kub system's lack of an autonomous target illumination and guidance radar, while allowing Ukraine to continue using available Kub missiles despite constraints on Buk missile supplies.



*Kub launcher and Buk firing unit shown together in Ukrainian military footage. (Source: **156th Anti-Aircraft Missile Regiment**)*

The concept has historical precedent. During the transition from Kub to Buk systems in the 1970s and 1980s, the 9A38 self-propelled firing unit was developed for the Kub-M4 configuration with interchangeable missile rails designed to accommodate either three Buk 9M38 missiles or three Kub 3M9M3 missiles. The configuration recently demonstrated by Ukrainian forces differs from that arrangement: it combines a Kub launcher with a Buk firing unit.

The regiment also operates a separate hybrid solution known as FrankenSAM, which modifies Buk launchers to fire American RIM-7 surface-to-air missiles. According to a crew commander, one vehicle has recorded 34 confirmed aerial targets destroyed, while another launcher has reportedly conducted 131 RIM-7 launches.

Such adaptations can help alleviate ammunition shortages and maintain interception capacity, particularly against increasingly challenging jet-powered drones.

UKRAINE DEVELOPS LOW-COST DOMESTIC MISSILES TO COUNTER RUSSIAN JET-POWERED DRONES

Ukraine is preparing two domestically developed surface-to-air missile systems for combat use against Russian jet-powered Geran drones, as Kyiv seeks more affordable ways to counter increasingly fast and costly aerial threats. According to Andrii Hrytseniuk, head of Ukraine's Brave1 defense innovation cluster, two Ukrainian development teams are preparing their missiles for operational deployment, with a key requirement that each missile cost no more than $20,000.

In an **interview Hrytseniuk described** the projects as relatively inexpensive and straightforward to manufacture. Brave1 began funding the development of Ukrainian air-defense missiles in 2024, and the first prototypes took approximately two years to develop. Ten Ukrainian teams are now working on missile projects in this category, although the two systems approaching combat use represent the most advanced efforts described in the interview.



Illustrative missile photograph used in Oboronka's report; it does not identify either of the two new Ukrainian interceptor designs. (Source: **Oboronka***)*

The target price is significantly below that of established Western air-defense munitions. A Stinger missile can cost well over $100,000, while an AIM-9X missile used by aircraft such as the F-16 can cost several hundred thousand dollars.

Against this backdrop, a Ukrainian interceptor priced at $20,000 could offer a substantially more economical option for engaging drones, particularly when conventional air-defense missiles are in limited supply.

The economic rationale is especially relevant to Russia's long-range Geran drones and their faster jet-powered variants.

The conventional Geran is estimated to cost approximately $70,000, while the jet-powered version may cost tens of thousands of dollars more.

Even if two or three Ukrainian missiles were required to destroy a single target, the engagement could remain economically favorable compared with using more expensive Western interceptors. Actual cost-effectiveness, however, will depend on the missiles' performance, production costs at scale, and interception success rates.

SIX UKRAINIAN COMPANIES BEGIN SERIAL PRODUCTION OF MINIATURE TURBOJET ENGINES

Six Ukrainian companies have begun serial production of miniature turbojet engines, marking a significant step toward building a domestic supply chain for next-generation drones, including jet-powered interceptors. The development was announced by Andrii Hrytseniuk, head of Ukraine's Brave1 defense innovation cluster, in **an interview** with the Ukrainian defense publication **Oboronka**.

11 Ukrainian companies are currently developing miniature turbojet engines, with **six having reached serial production**. Brave1 launched a dedicated funding program for the sector in 2025, working directly with manufacturers to establish domestic production capabilities. Hrytseniuk said that no private Ukrainian company had previously manufactured these engines, and that establishing production has taken more than 18 months.



*Jet-powered drone shown in coverage of Ukraine's miniature turbojet production. Illustrative image, not a photograph of the engines themselves. (Source: **Oboronka**)*

The expansion of domestic engine manufacturing addresses a key constraint on scaling up production of jet-powered unmanned systems. Ukraine's ability to produce more interceptors depends not only on airframe and guidance-system development, but also on access to propulsion systems that can be supplied in sufficient quantities. Domestic manufacturing could reduce reliance on imported engines and give Ukrainian developers greater control over production schedules and supply.

However, the number of companies producing at scale does not by itself establish their total output, unit costs, or ability to meet demand. Production volumes and delivery capacity will be important indicators of whether this emerging industrial base can support the wider expansion of Ukraine's jet-powered drone and interceptor programs.

UKRAINE USES BRITISH K3 SCOUT USVS IN STRIKE ON RUSSIAN SHIP IN SOCHI

Ukraine used British-made K3 Scout unmanned surface vessels during a September 3 attack on the Russian port of Sochi, marking a reported combat use of the platform against a Russian maritime target. **At least two USVs entered the port and attacked** the Russian multipurpose supply vessel *Nefrit*. One drone reportedly penetrated the port's defensive perimeter and damaged the ship's port side, while the second exploded before reaching the target. Earlier **GEOINT analysis had geolocated the strike** and identified *Nefrit* as the vessel hit near the pier.

The K3 Scout, produced by British company Kraken Technology, is an 8.4-meter unmanned surface vessel designed for long-range, modular operations. **Platform can reach around 55 knots**, has a range of approximately 650 nautical miles (1,200 km), can remain at sea for up to 30 days, and carries payloads of up to 600 kg. Its open architecture allows it to support different mission modules, including reconnaissance, electronic warfare, FPV-drone carriage, strike missions, and casualty evacuation.



K3 Scout unmanned surface vessel being deployed from a transport aircraft. (Source: **Kraken Technology***)*

It demonstrates Ukraine's ability to integrate a foreign-built USV into an operational long-range maritime strike, rather than relying exclusively on domestically developed platforms such as Magura or Sea Baby. The distance from Ukrainian-controlled waters to Sochi also highlights how extended-range USVs can threaten Russian naval and logistics infrastructure across a much broader portion of the Black Sea.

For Western militaries, the operation provides a real-world example of how relatively small, modular autonomous vessels can be adapted from surveillance and support roles into offensive missions against defended ports and maritime logistics targets. This follows the broader pattern outlined in our report **"The Black Sea's Asymmetric Blueprint,"** which showed how Ukraine has used attritable unmanned systems and rapid adaptation to push the Russian Black Sea Fleet away from Crimea and reshape the regional maritime balance.



*K3 Scout unmanned surface vessel operating in Sochi during Ukraine's maritime strike mission. (Source: **Militarnyi**)*

UKRAINIAN NAVY TRAINS WITH SEAFOX UNDERWATER DRONES FOR BLACK SEA MINE CLEARANCE

Ukrainian naval crews have trained in the United Kingdom to detect and destroy sea mines using SeaFox remotely operated underwater vehicles, further preparing for future mine-clearance operations in the Black Sea. The drills took place **aboard the Ukrainian Sandown-class minehunter *Cherkasy*** under Operation Interflex Maritime, with British mine-countermeasures specialists assessing the crews' performance.

The training covered the full mine-neutralization cycle. Ukrainian sailors first used the reconnaissance version of SeaFox, equipped with sonar and a camera, to survey the seabed and locate a training mine. They then practiced the disposal procedure with a training variant before deploying the combat SeaFox C, which carries an explosive charge of about 1.5 kg and is detonated next to the target.

SeaFox is approximately 1.3 meters long, weighs around 40 kg, and can operate at depths of up to 300 meters.

The exercise is part of a broader effort to build Ukraine's postwar mine-countermeasures capacity. The **Royal Navy** confirmed that crews of both *Chernihiv* and *Cherkasy* conducted live SeaFox firings during the Lion Protector exercise, while five Ukrainian mine-countermeasure vessels also trained together with HMS *Dauntless*. With large areas of the Black Sea expected to remain contaminated by mines long after hostilities end, these capabilities will be central to reopening maritime routes and protecting commercial shipping.



*Ukrainian Navy personnel prepare a SeaFox underwater mine-disposal vehicle aboard the Sandown-class minehunter Cherkasy during mine-countermeasure training in the United Kingdom. (Source: **BFBS Forces News**)*

U.S. ARMY TESTS UKRAINIAN MV7 NAVAL DRONES AS AUTONOMOUS SYSTEMS CARRIERS

The U.S. Army has tested Ukrainian-made MV7 unmanned surface vessels (USVs) during Exercise Bayonet Quest 26 in Michigan, exploring how autonomous maritime platforms could expand military surveillance and reconnaissance capabilities. **Ukrainian vessels were used as carriers for unmanned aerial vehicles** (UAVs), highlighting their potential to support integrated maritime and aerial operations.

Ukrainian defense company UFORCE confirmed to Ukrainska Pravda that MV7-class naval drones participated in the exercise. The 7th Infantry Division described the trials as part of broader testing of autonomous systems for the U.S. Army. The exercise included crewed-uncrewed maritime operations pairing a Mk VI patrol boat with autonomous platforms to examine how the systems could operate together in complex terrain. The U.S. Army did not disclose how many MV7 vessels were involved or provide further details on the systems' performance.



MV7 unmanned surface vessel carrying a UAV during U.S. exercises. (Source: **Ukrainska Pravda***)*

The trial reflects U.S. interest in integrating uncrewed platforms into existing military formations, where they could extend situational awareness while reducing the need to expose personnel directly to risk. Using a surface vessel as a UAV carrier also offers a potential way to combine maritime mobility with aerial reconnaissance, although the specific operational configurations and capabilities tested in Michigan have not been publicly detailed.

Bayonet Quest 26 is reportedly the second publicly known instance of U.S. forces testing Ukrainian unmanned surface vessels. In April 2026, U.S. Army Special Forces tested Ukrainian Magura naval drones during exercises in the Philippines, where the systems were used to strike and sink a target vessel. Taken together, the two trials indicate continued U.S. evaluation of Ukrainian maritime drone technology for different mission profiles, from reconnaissance support to offensive maritime operations.

BLUEBIRD TECH UNVEILS UPDATED "CHUYKA 4.5.0" DRONE DETECTOR

Ukrainian defense-tech company BlueBird Tech has released a new version of its Chuyka 4.5.0 portable drone detector with a substantially expanded frequency range and new video-output functionality. **The updated system now operates** across four frequency bands — 1,080–2,200 MHz, 2,870–4,500 MHz, 4,890–6,040 MHz, and 6,050–8,800 MHz. BlueBird Tech says the newly added 6.05–8.8 GHz range is intended to improve detection of newer FPV drones and fixed-wing UAVs, including Russian Molniya systems.

The detector scans all four bands simultaneously in approximately 4–8 seconds. When it detects a relevant signal, Chuyka provides visual and audible alerts and displays the intercepted analog video feed on its built-in screen. **BlueBird Tech** says that the new version can also output intercepted FPV video to external monitors or televisions, allowing command posts and unit headquarters to analyze enemy drone feeds on larger displays.

The manufacturer states that detection range can reach up to 4 km, depending on terrain, antenna configuration, interference, and transmitter power.

The upgrade reflects how quickly the electronic-warfare environment is evolving around FPV operations. **BlueBird Tech had already expanded the previous Chuyka 4.0** to cover frequencies up to 4.5 GHz after testing confirmed stable detection of signals used by Russian Molniya drones at distances of up to 3 km. The new 4.5.0 model extends that adaptation further by adding higher-frequency coverage rather than simply improving sensitivity within existing bands.

The system weighs about 940 grams, uses a 5,000 mAh battery for up to 4.5 hours of operation, and is housed in an IP54-rated enclosure with MOLLE-compatible mounts. Its significance is less in any single specification than in the pace of iteration: as Russian drone operators shift video links to new bands and frequencies, Ukrainian manufacturers are updating passive detection systems fast enough to keep pace with those changes.



*BlueBird Tech's updated Chuyka 4.5.0 portable drone detector. (Source: **BlueBird Tech**)*

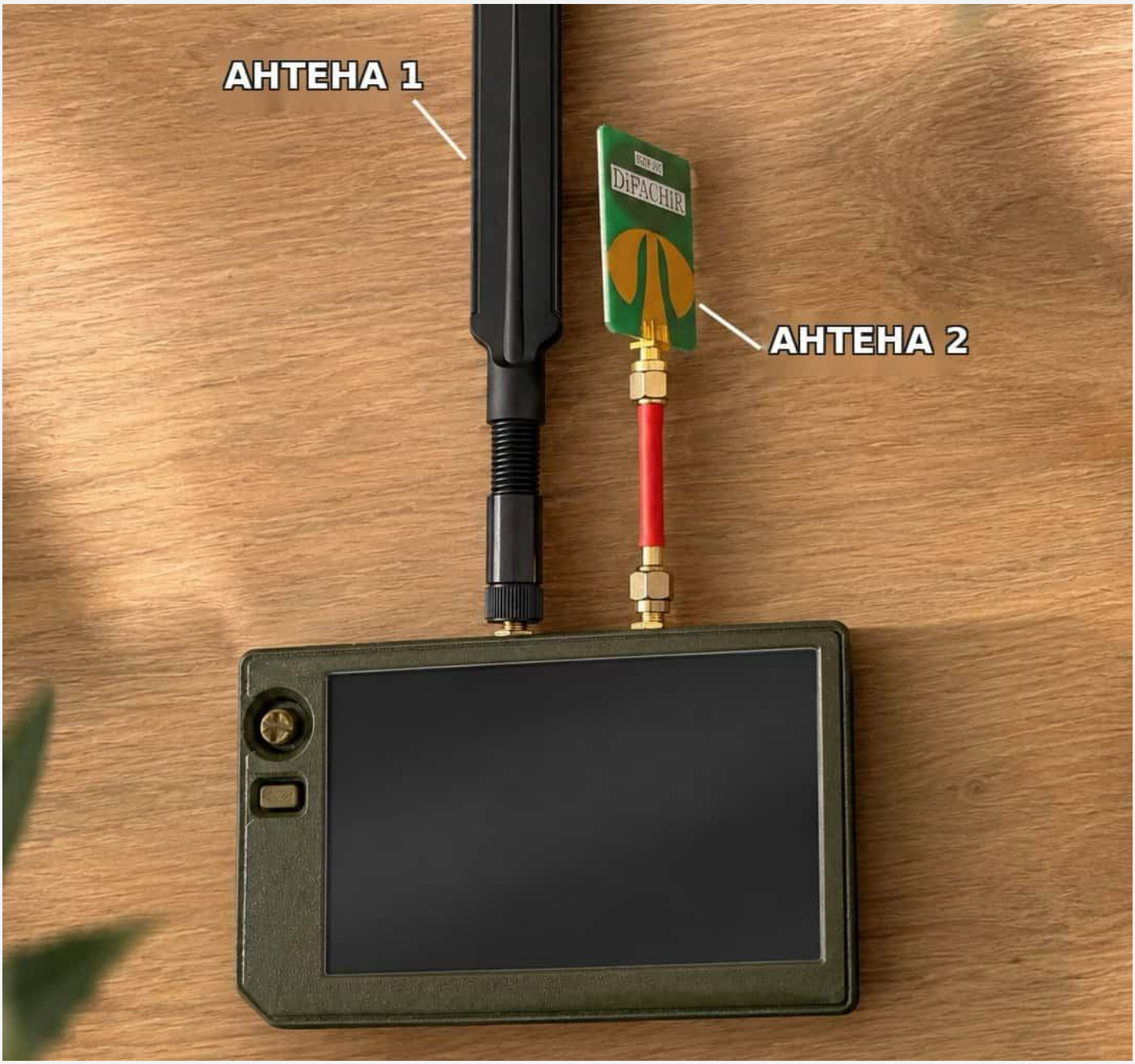
UKRAINE'S CODE380 DEVELOPS PORTABLE SDR DRONE DETECTOR THAT CAN INTERCEPT ANALOG VIDEO FEEDS

Ukrainian company CODE380 has developed the D·Vision SDR, a portable radio-frequency analyzer designed to detect drone signals across a wide spectrum and, when the UAV uses an analog link, display the video transmitted from the drone itself. **System is built around software-defined radio** (SDR) technology, allowing signal processing to be handled through software rather than fixed analog receiver architecture. This makes the detector easier to adapt as drone communication protocols and operating frequencies change.

The device scans roughly 500–8,700 MHz and can detect analog PAL and NTSC video transmissions as well as compatible digital signals used by DJI Mavic-series drones. The distinction is important: D·Vision SDR can decode and display analog video, but it does not decode DJI digital video; instead, it detects the corresponding radio emission. **Platform was created by Kyiv-based CODE380** and has already undergone field testing with Ukrainian military personnel, with frontline feedback being incorporated into subsequent software updates.



*CODE380's D·Vision SDR portable radio-frequency analyzer (Source: **DOU**)*



*D·Vision SDR with its two-antenna configuration. (Source: **D·Vision**)*

Analog video reception can reach up to 10 km in the 540–6,000 MHz range, while signals above 6 GHz can be received at approximately 3.5–5 km. Compatible DJI Mavic digital signals can be detected at distances of up to 2.5 km. The unit weighs around 290 grams, includes two SMA antenna inputs, supports microSD recording, offers a spectrum "waterfall" display, and can also be used for testing electronic-warfare systems.

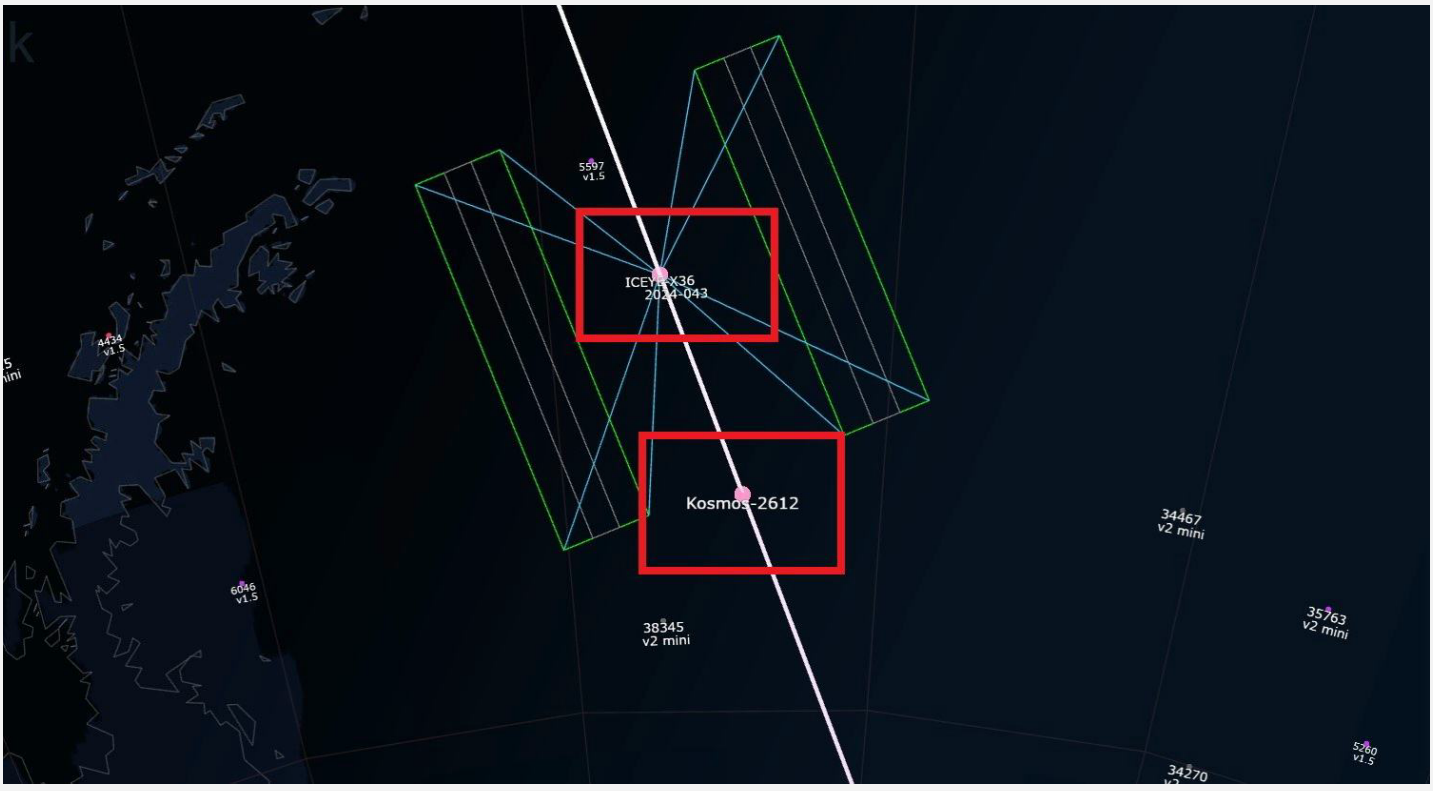
D·Vision SDR combines drone warning, spectrum analysis, and direct exploitation of analog video links in a single portable device.

Instead of merely alerting soldiers that a UAV is nearby, the system can potentially show operators what an enemy analog FPV drone is seeing, giving units additional situational awareness while also helping identify changes in adversary frequencies and communication methods. Because much of the detection logic is software-based, CODE380 can update the platform as Russian drone operators shift bands or introduce new transmission patterns, making it part of the broader Ukrainian effort to shorten the adaptation cycle in the electronic-warfare contest.

RUSSIAN MILITARY SATELLITE CLOSES TO WITHIN 26 METERS OF ICEYE SPACECRAFT

Russia's military satellite Kosmos-2612 has maneuvered into extremely close proximity to ICEYE-X36, a commercial synthetic-aperture radar satellite operated by ICEYE, whose imagery has been used to support Ukraine. **Orbital tracking data showed that the two spacecraft** came within approximately 26 meters of each other on October 19 at an altitude of roughly 541–555 km. **Earlier, on October 17**, commercial space-tracking company LeoLabs had measured a separation of about 4.8 km, while independent satellite observer Marco Langbroek estimated that the satellites had already approached within 1–2 km.

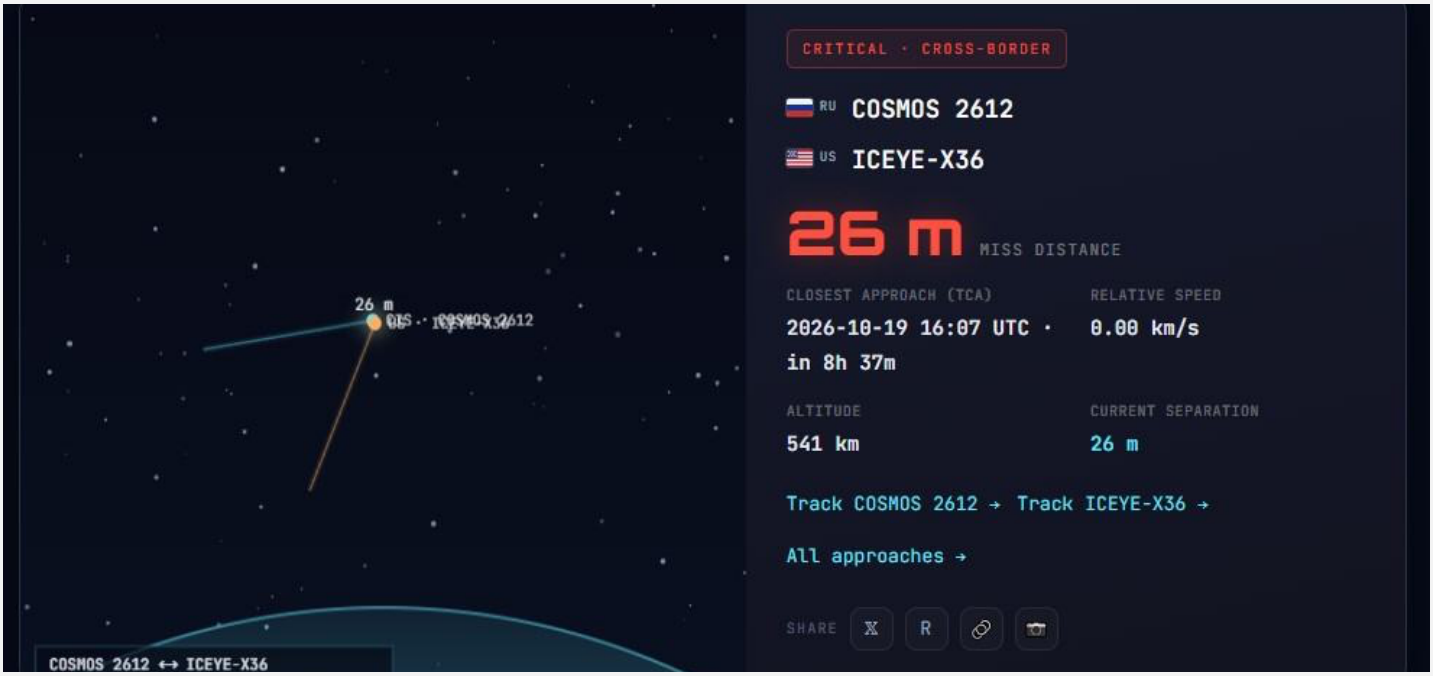
The encounter appears to be the result of a deliberate Russian rendezvous campaign rather than a routine orbital crossing. **SatTrackCam Leiden** documented a series of Kosmos-2612 maneuvers beginning on September 30 and continuing on October 12, 15, and 16, designed to align its orbital altitude, inclination, eccentricity, and period with ICEYE-X36. On October 12 alone, the Russian spacecraft reportedly conducted a 27.9 m/s maneuver that brought it back toward ICEYE-X36's orbital plane and altitude. Such proximity operations can enable close inspection of another spacecraft and potentially demonstrate capabilities relevant to interference or counter-space operations, although there is currently no evidence that ICEYE-X36 was physically attacked or disrupted.



*Orbital visualization showing Russian military satellite Kosmos-2612 maneuvering in close proximity to the commercial ICEYE-X36 radar satellite. (Source: **satellitemap.space**)*

ICEYE's radar constellation provides imagery regardless of cloud cover or darkness and has become part of Ukraine's intelligence architecture. The deliberate shadowing of a commercial satellite linked to Ukrainian defense therefore demonstrates how the Russia-Ukraine conflict is increasingly extending into the space domain, where commercial ISR platforms can become objects of military surveillance and coercion.

It also highlights a broader vulnerability for the United States and its allies: commercially operated satellites supporting military operations may increasingly face close-proximity surveillance or other counter-space activity even without a conventional kinetic attack.

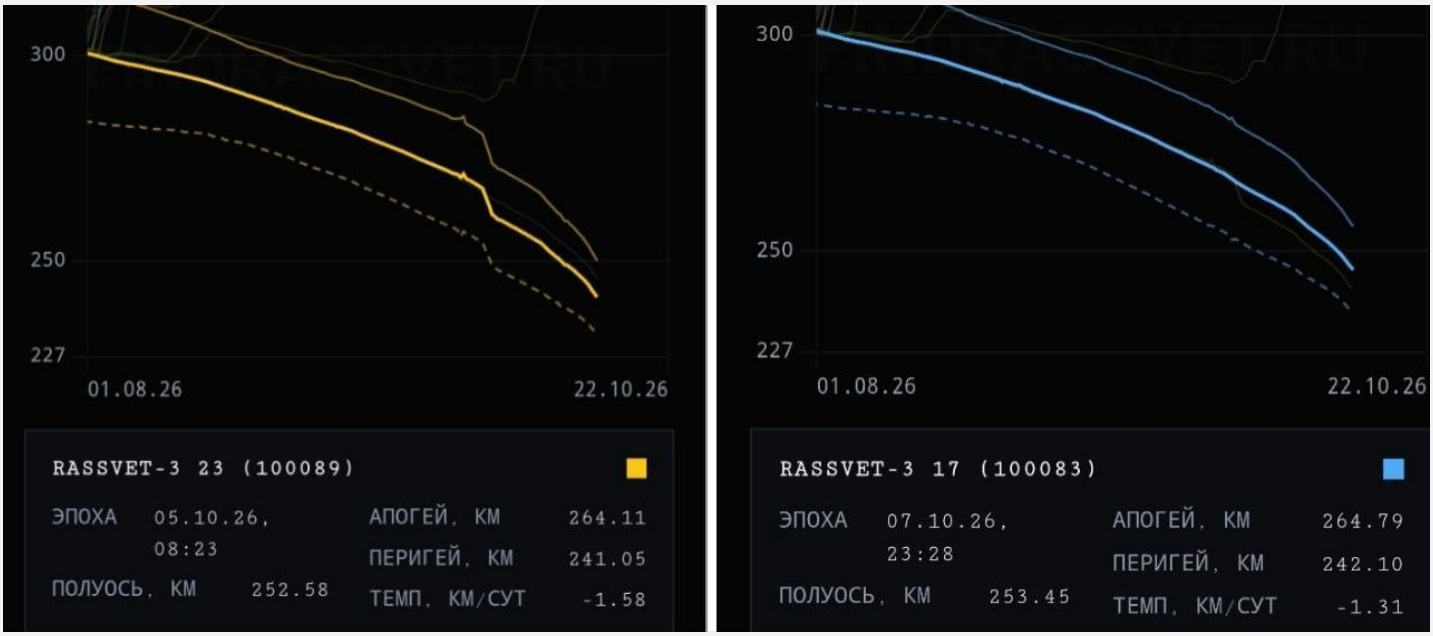


*Tracking data showing Kosmos-2612 approaching ICEYE-X36 to within approximately 26 meters at an altitude of about 541 km. (Source: **Orbital Radar**)*

RUSSIA'S RASSVET SATELLITE NETWORK SUFFERS ORBITAL SETBACKS BUT REMAINS A GROWING BATTLEFIELD THREAT

Russia's Rassvet low-Earth-orbit communications constellation, intended as a domestic alternative to Starlink, is facing new technical problems. Two satellites from the July launch batch — Rassvet-3 No. 17 and No. 23 — had dropped to 241-265 km (as of 7 October 2026) and were continuing to lose altitude. Russian aerospace monitoring channel Operativnaya Liniya reported earlier in October that both spacecraft were descending by about 1.5 km per day; unless their orbits were raised, they were expected to re-enter the atmosphere. Independent tracking pointed in the same direction: **SONIKS** projected re-entry of No. 23 around October 27 and No. 17 around October 28, while **The Aerospace Corporation** separately classified Rassvet-3 No. 17 as a decaying payload. **No.17 re-entered on 29-30 October** and **No.23 resumed orbit-raising in late October**.

The problem is broader than two spacecraft. Russia has launched 32 Rassvet satellites in two batches during 2026, but the constellation has had an uneven deployment record. **At least three of the 32 satellites had likely suffered** outright failures by early September, while **only 12 of the first 16 reached their intended altitude** and the entire second batch initially remained below its planned operational orbit. One satellite from the first batch had already re-entered the atmosphere in June, and No.17 from the second batch followed in October.



*Orbital tracking of Rassvet-3 satellites No. 23 and No. 17 showing their continued loss of altitude in October 2026. (Source: **Operativnaya Liniya**)*

Despite these setbacks, the system is already providing limited connectivity over Ukraine. Presidential adviser on defense technologies **Serhii "Flash" Beskrestnov has said** that the current constellation can provide approximately 30–40 minutes of connectivity over Ukraine, although other open-source estimates put the available daily windows somewhat higher depending on orbital geometry. He assesses that roughly 200–250 satellites would be required for continuous, stable coverage. **Bureau 1440** plans to expand the constellation rapidly, with around 292 satellites targeted by 2027 and more than 900 by 2035.

The near-term outlook is therefore mixed.

The current constellation is far from a Russian equivalent of Starlink: 32 satellites, not all of them operational, can provide only intermittent service, several spacecraft have failed to reach stable operational orbits, and the loss of additional satellites increases pressure on an already ambitious launch schedule. Independent analysts remain skeptical that Russia can meet its stated deployment timeline; **Moscow was already behind its 2026 deployment targets**. At the same time, the underlying technology appears functional: Bureau 1440 has demonstrated satellite broadband links and inter-satellite laser communications, meaning that the central question is increasingly one of scale, launch reliability, and production capacity rather than basic feasibility.



*Mission control center for Russia's Rassvet satellite constellation, operated by Bureau 1440. (Source: **Ukrainska Pravda**)*



*Prototype user terminal for Russia's Rassvet low-Earth-orbit satellite communications network, developed by Bureau 1440. (Source: **Militarnyi**)*

If Russia eventually reaches the roughly 200–250 operational satellites needed for persistent coverage, Rassvet could enable a major change in Russian drone operations: long-range UAVs could receive new targeting data, transmit reconnaissance imagery, and be retasked in flight rather than relying primarily on pre-programmed routes.

That is why the current failures are significant but should not be interpreted as the collapse of the program. They instead show that Russia is attempting to move from experimental satellite communications toward a militarily useful constellation while still struggling with the engineering and launch-rate demands required to achieve continuous coverage over Ukraine.

SPACE IN NUMBERS

26 m
closest approach of Kosmos-2612 to ICEYE-X36 on October 19

32
Rassvet satellites launched in two batches in 2026

200–250
satellites needed for continuous coverage over Ukraine

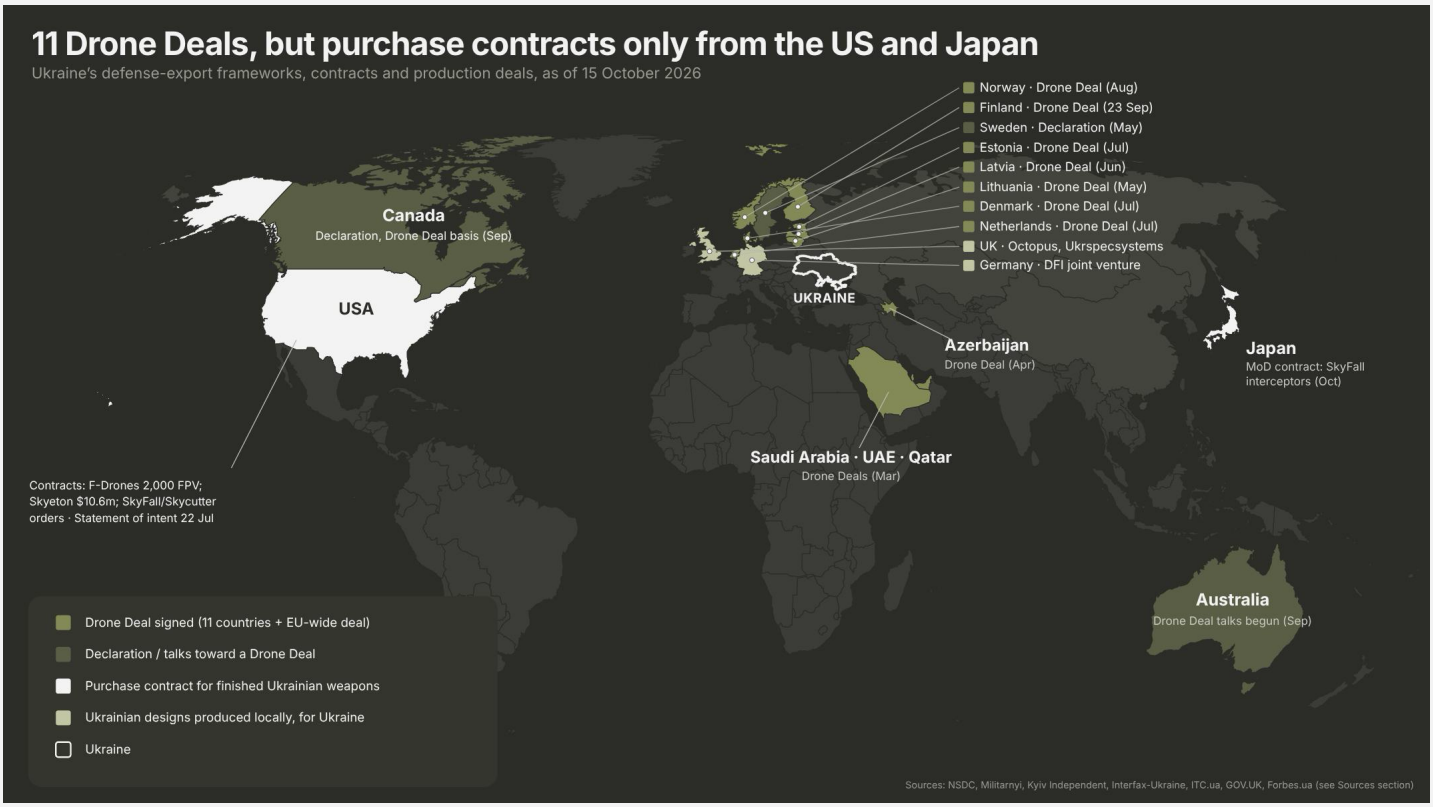
292
Rassvet satellites Bureau 1440 targets by 2027

> "The central question is increasingly one of scale, launch reliability, and production capacity rather than basic feasibility."

FROM DRONE DEALS TO DELIVERIES: WHERE UKRAINE'S DEFENSE EXPORT AGREEMENTS WITH NATO COUNTRIES ACTUALLY STAND

A year after Ukraine announced the opening of arms exports, more than 10 intergovernmental Drone Deal agreements have appeared, along with a letter of intent with the US and the first factories producing Ukrainian drones in Germany and Britain. Meanwhile, private manufacturers, **by the industry's estimate**, have signed no more than 10 small export contracts in that time, while the fast-track procedure the government launched in July has not **yielded** a single permit in three months. Ukrainian defense exports to NATO countries are already developing, but so far these are isolated success stories rather than a systemic export flow.

Volodymyr Zelensky first publicly announced the opening of exports in September 2025, and in February 2026 the interagency commission under the National Security and Defense Council (NSDC), without which no export permit can be issued, resumed its work. NATO signatories include Lithuania, Latvia, Estonia, the Netherlands and Denmark, agreements were **signed** with Norway in August, with Finland on September 23, which **became** the 11th country. The rest are Saudi Arabia, the UAE, Qatar and Azerbaijan.



Map of Ukraine's Drone Deal agreements as of October 15, 2026. (Sources: **Ukraine's NSDC - Drone Deals; Office of the President of Ukraine - Finland Drone Deal; Interfax-Ukraine - Japan's SkyFall Interceptor Drone Contract; GOV.UK - Project Octopus; Kyiv Independent - SkyFall–Airbus Partnership**.*)*

On July 22, the US signed **a letter of intent**, which allows Ukrainian drones to be transferred to the US military for testing. Ten Ukrainian export offices are due to open in Europe by the end of the year; the first has opened in Berlin.

Moving from announcements to numbers, the picture is more modest. There are two sets of estimates: one from the government and one from the industry.

Table 1. Announced vs. actual: the state of Ukraine's defense export initiatives as of October 2026

What was announced	What is known as of October 2026
"Ukraine opens arms exports" (February 2026)	Since February, the NSDC commission has reviewed more than 400 applications and approved over 90%. But these are mostly repairs, servicing and components from state-owned companies and special exporters. Permits for sales of finished products number just 18.
Fast-track procedure under Resolution No. 875 (July 2026)	Over three months, not a single permit has been issued. The lists of critical goods and permitted countries, without which the mechanism cannot start, have still not been approved.
Private manufacturers enter foreign markets	According to the Council of Gunsmiths (August 2026), no more than ten small export contracts were signed over the year.
Joint production in Europe under the Build with Ukraine program	By the same estimate, only one joint venture is actually operating, and its output goes to Ukraine's Defense Forces. More than 200 partner initiatives are awaiting a decision.
Drone Deal with the US	A letter of intent has been signed; drones are being handed over for testing. There is still no contract for serial procurement or joint production.
More than ten Drone Deal agreements	These are intergovernmental frameworks, not contracts. About five countries, according to the NSDC, are finalizing specific weapons requests.

The head of the commission, NSDC Deputy Secretary Davyd Aloyan, **said** in an interview with LB.ua that most applications concern repairs, servicing and individual components, and are submitted by state-owned enterprises and special exporters that were already exporting before the full-scale war. **According to him**, from February to June not a single new company applied specifically to sell finished products.

Ukraine remains one of Europe's leading centers of defense technology development, but its investment capacity lags far behind its technological potential. **According** to the study *The State of Defence Tech 2026* by Dealroom and Resilience Media, Ukraine ranks fifth in Europe by number of defense startup founders (82 entrepreneurs) but only tenth by funding raised. In 2026, Ukrainian defense startups raised $19.8 million, while total investment in Europe's defense-tech sector reached $7.4 billion by September. This gap indicates that even with combat-proven technologies, Ukrainian companies have limited access to the capital needed to scale up production and enter international markets.

The cleanest example of Ukrainian weapons going all the way from competition to delivery is the F-Drones contract. The US company UDD Tech Corp, which represents the Ukrainian FPV drone F10, placed sixth among 25 participants in the first phase of the Pentagon's Drone Dominance program and received a prototype order for 2,000 drones. On July 1, the State Service of Export Control issued Ukraine's first-ever permit to **export** finished strike drones, and the batch was shipped to the US. By mid-August, UDD was one of three first-phase suppliers that had **fully** completed deliveries. The company also announced **an assembly plant in Ohio** worth $18.4 million.

In September it was joined by a US Army contract with Skyeton worth $10.64 million for Raybird **reconnaissance** drones.

But the second phase has already shown how shaky this position is. In **the Gauntlet II results**, published in September, none of the four Ukraine-linked teams made the top five. The organizers separately stressed that second-phase drones are **cheaper** and more closely tied to the American industrial base. It is also telling that the first phase was won by British company Skycutter with a drone **developed** by Ukraine's SkyFall — the technology is Ukrainian, but the seller is not.

What's more, **according to Bloomberg**, in negotiations on a broader deal Washington is seeking technology transfer and access to intellectual property. The Americans are interested in more than the product itself.

In July the Pentagon updated the program's terms: the long-term goal is an entirely American supply chain for small drones, some foreign components were **banned** in Gauntlet II, and Ukrainian participants were **required** to open production in the US. Teams also had to source NDAA-compliant components and integrate American warheads — Ukrainian manufacturers say this took time. Ukraine cannot influence these rules, but it can adapt to them: F-Drones (Ohio) and Skyeton (**North Carolina**) are already localizing in the US. The question for Kyiv is how much value, tax revenue and intellectual property will remain in Ukraine once the plant is in Ohio.

European projects that are usually cited as proof of export success actually work for the Ukrainian front. The joint venture Quantum Frontline Industries, launched in Germany in February, is to produce up to 10,000 Linza drones a year — all for Ukraine's Defense Forces.

Since January, Britain has been **producing** Octopus interceptors under license and is also sending them to Ukraine. This is localization of Ukrainian production funded by partners, not sales to European armies.

There is export potential here. According to the Financial Times, after the first 10,000 drones, QFI's partners have the right to sell the surplus to Western armies, and Quantum Systems is in talks with the Bundeswehr. The JV has already **received** a follow-on contract from Ukraine's National Guard and plans to increase production fivefold next year. But the buyer is, once again, Ukraine.

Other projects are moving more slowly than promised. Fire Point's solid rocket fuel plant in Vojens, Denmark, which was due to start operating in 2026, has been **postponed** to late 2027, and its estimated cost has risen from €50 million to more than €150 million — the building that was purchased did not meet safety requirements.

Meanwhile, large European orders go to local manufacturers. This spring Germany was preparing a €2.4 billion framework agreement with Rheinmetall for drones, Airbus brought its own interceptor to testing in nine months, and in France there is open discussion of future competition with Ukrainian companies. Aloyan acknowledges that Europe has a strong defense industry of its own and protectionist markets, and that demand for weapons overall is lower than in Asia or the Middle East.

Why does Europe use Ukrainian designs only for Ukraine? There are three reasons, and they are structural rather than hostile:

- **Who pays.** Build with Ukraine projects are financed from military aid budgets for Ukraine, so by design the output goes to the front. If the money goes into purely commercial plants, the front will get less.
- **The "buy European" rule.** The EU's €150 billion SAFE instrument finances only procurement where at least 65% of component value originates in the EU, EEA-EFTA or Ukraine. Ukraine is within this circle, but in practice the money goes to firms with production in EU countries.
- **Own industry first.** Large orders go to local champions such as Rheinmetall or Airbus.

Ukraine can influence this more than in the US – since SAFE already recognizes Ukrainian industry as "European," joint ventures in the EU with Ukrainian designs can compete for EU-funded procurement. The channels for this are the pan-European Drone Deal and the export offices in Europe.

Six Ukrainian companies have a confirmed foreign contract, plant or listing, but almost all got there through a foreign subsidiary or partner rather than through direct exports from Ukraine.

Table 2. Ukrainian defense companies with a confirmed foreign contract, plant or listing, and how they got there

Company	Product	Success abroad	Route
SkyFall	FPV Shrike 10 Fiber, P1-SUN interceptor	Gauntlet I win (99.3 points), Japanese Ministry of Defense contract (October 2026)	British partner Skycutter (UK), directly (Japan)
F-Drones	FPV drone F10	First permit to export finished strike drones, 2,000 drones for the US Army, plant in Ohio	American UDD Tech Corp
Skyeton	Raybird reconnaissance UAV	US Army contract worth $10.64 million, production in Slovakia, a JV in Britain, partnership with Spain's Escribano	Skyeton Inc. (US), plants abroad
Ukrspecsystems	Shark and PD-2 reconnaissance drones	First Ukrainian defense plant in Britain (Mildenhall, February 2026), £200 million investment	its own British company
Frontline	Linza bomber drone	JV Quantum Frontline Industries in Germany, up to 10,000 drones a year, right to sell the surplus	JV with Quantum Systems
Swarmer	Drone swarm software	First IPO of a Ukrainian defense company on Nasdaq (March 17, 2026)	Headquarters in Austin, Estonian subsidiary

According to the Council of Gunsmiths, in 2026 the industry is capable of producing $55–60 billion worth of weapons, while the state buys at most half. As the arguments over prices continue, business is looking for workarounds.

According to a survey by Ukraine's Technology Forces, in early 2025 85% of manufacturers were considering relocation or had already **relocated**, after the announcements on opening exports the share fell to 51%. By March 2026, by industry estimates, up to a hundred miltech companies had moved abroad. In March, Zelensky himself spoke of about ten Ukrainian-origin interceptor plants built abroad without the state's knowledge.

Some companies sell not “hardware” but software, through foreign jurisdictions. Swarmer, a developer of drone swarm software, for example, **listed on Nasdaq** and licenses its products through an Estonian subsidiary. This, too, is an export of Ukrainian technology, but the taxes and intellectual property end up outside Ukraine.

Serhii Prytula, **commenting** on the German contract with Rheinmetall, estimated that by 2027 Western manufacturers will catch up with Ukrainian ones: “After that, it will be too late.”

Ukraine’s drones have passed Pentagon selection, its designs are produced in Germany and Britain, and NATO countries are signing agreements with it on exchanging experience; but it is still too early to talk about a mass breakthrough into Western markets. For now, the West is buying from Ukraine primarily knowledge, licenses and access to combat experience, and serial products only in single batches.

Whether this changes depends on three things: whether the government rewrites Resolution No. 875 so that exporting becomes worthwhile, whether Drone Deal agreements turn into firm contracts, and whether Ukrainian companies manage to establish themselves before Western competitors catch up with them technologically.

“After that, it will be too late.”

— Serhii Prytula on Western manufacturers catching up with Ukrainian ones by 2027

UKRAINE’S DEFENSE EXPORTS IN NUMBERS

11
intergovernmental Drone Deal agreements

0
permits issued via the fast-track procedure in three months

≤10
small export contracts signed by private manufacturers

$19.8M
raised by Ukrainian defense startups in 2026, vs $7.4B across Europe

“The technology is Ukrainian, but the seller is not.”

PHALANX MULTI-DOMAIN OPERATIONS CENTER: A RESPONSE TO MODERN CHALLENGES ON THE BATTLEFIELD

1st Separate Assault Regiment & 475th Separate Assault Regiment "CODE 9.2"

For the last few decades, military thought was based on one, unshakable axiom: the concentration of forces and assets along a selected axis leads to a breakthrough of enemy defenses. Classic combined arms warfare envisioned concentration of large, mechanized formations in assembly areas, the advance of armored spearheads under air-defense cover, a massive rolling artillery barrage, and rapid exploitation of the breakthrough to operational depth.

In recent years, in the Ukrainian theater of operations, this concept has faced the physical reality of a transparent battlefield.

The complete saturation of the airspace with reconnaissance unmanned systems at every echelon, commercial satellite constellations with near continuous data refresh rates, and automated analysis of the electromagnetic spectrum have effectively eliminated the very concept of operational concealment. It is no longer possible to hide a troops concentration area. Within 20-30 kilometers of the line of contact, a continuous engagement zone (a "kill zone") emerges.

Any attempt to assemble an armored column is overwhelmingly likely to be disrupted by the enemy before headquarters can even issue a combat order.

This has confronted assault units with a systemic crisis of what we call "short reach." Equipped only with small arms, armored vehicles, and tactical drones with a range of 10–20 km, assault troops were entering combat against an enemy with fully functioning supply lines, fresh reserves, and enough fuel to maneuver. Meanwhile, under the conventional vertical military bureaucracy, coordinating fire support can take days or even weeks.

Response to that was the creation of the Phalanx Multi-Domain Operations Center by two separate assault regiments — 1 SAR named after Dmytro Kotsiubailo and 475 SAR (CODE 9.2). This is an unconventional form of military cooperation between two independent units, combining their intelligence capabilities, long-range assets, and command-and-control algorithms within a single operational environment.

The modern "spear" of assault troops consists of Ukrainian-made middle- and deep-strike systems – the Darts, FP-2, and Behemoth – with ranges of 50-150 km, placed directly at the disposal of those fighting on the ground.

For our troops, an assault no longer begins with dismounting from an armored vehicle, but begins 100 kilometers from the front line.

These Phalanx strike assets systematically target logistical infrastructure, destroying vehicles and field ammunition depots in the enemy rear. Infantry moves in only at the final stage, entering combat once the enemy has been deprived of communications, ammunition, and reserves.

The enemy is adapting as well. Russian forces are attempting to compensate for their losses by deploying dense, layered air-defense systems-including Tor and Pantsir systems-and by trying to establish continuous manpower-replenishment pipelines along key highways in the Zaporizhzhia and Donetsk regions.

The Phalanx Center has responded by employing small-swarm tactics, launching three to seven drones simultaneously. The first drones deliberately draw fire, forcing the air-defense system to reveal its position, while those following strike the exposed radar. No strike is counted without mandatory follow-up reconnaissance, and every drone is launched with a set of alternative targets in case it encounters active electronic warfare. The results speak for themselves: Phalanx consistently ranks among the top 15–20 units of the Ukrainian Defense Forces in terms of successful strikes against the enemy.

The mistake of traditional military command lies in treating assault units solely as infantry instruments for close combat. Ordering an assault against defenses that have not been isolated while enemy logistics remain intact is a path to critical losses.

At Phalanx, we have four domains (infantry, UAVs, multi-sensor intelligence (GEOINT/SIGINT), and real-time analytics) integrated into a single analytical chain. By paralyzing the supply of fuel and ammunition to Russia's Vostok Grouping, assault units of the Phalanx Multi-Domain Operations Center liberated more than 80 square kilometers on the Huliaipole axis during the first half of 2026.

In modern warfare, an assault unit can no longer be just infantry. It must become a multi-domain hub capable of independently dismantling the enemy's operational rear while preserving the lives of soldiers on the ground.

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Serpens Center for International Security

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Our mission is to strengthen how Ukraine and its allies think about, build, and sustain their defense, and to shape the new security alliances the 21st century demands.

Working from across Ukraine, we produce the research, programs, and partnerships that turn Ukraine's hard-won defense experience into the shared, lasting security of the West.

Through both official memoranda and our informal relationships across Ukraine's military and defense forces, every paper and program we produce is built alongside our partners in uniform.

We are headquartered in Kyiv. Also in Los Angeles.

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