

Defense

TECH MONTHLY



IN THIS EDITION

Oil Under Pressure: Ukraine Turns Deep Strikes Into Industrial Attrition

From Black Sea Combat to U.S. Production: MAGURA Goes Global

One Million Strikes: Ukraine's Drone Campaign Reaches Industrial Tempo

Forty Days of Pressure: Inside the SBU's Multi-Domain Strike Campaign

SPECIAL FEATURES

Old vs New: Misconceptions About Technology and Military Tactics in Ukraine Drones



Technology Alone Doesn't Win Wars. The People Who Know How to Use It Do



JULY 2026

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FROM DELIVERY TO LICENSED PRODUCTION: UKRAINE TO BUILD THE L119 LIGHT GUN

On July 21, British defense company BAE Systems and an unnamed Ukrainian defense manufacturer **signed a licensing agreement to support local production of the L119 105 mm Light Gun in Ukraine.**

The agreement was announced during the Farnborough International Airshow and is intended to develop a Ukrainian-adapted version for the Armed Forces.



L119, developed by BAE Systems
Source: [Unian](#)

Under the agreement, **the Ukrainian partner will receive access to BAE Systems' technical information and engineering support needed to manufacture an initial gun for testing.**

The companies have not disclosed the identity of the Ukrainian manufacturer, the planned production location, delivery schedule, or eventual number of systems.

The L119 is a lightweight, towed artillery system designed by BAE Systems and valued for its mobility and reliability. Local production could allow Ukraine to adapt the platform to its operational requirements while gradually reducing dependence on imported finished systems. It could also create domestic expertise for maintenance, component replacement, and future modifications.

The agreement forms part of a wider effort to strengthen Ukraine's sovereign artillery industry. BAE Systems is also restoring British production capacity for artillery components and supporting deliveries of British-designed 105 mm and 155 mm barrels manufactured in Sheffield for Ukraine.

However, the license should not yet be interpreted as the start of full-scale production. The immediate objective is to manufacture and test the first gun. Moving from that prototype to regular deliveries will still require tooling, trained workers, qualified suppliers, ammunition availability, successful trials, and funded procurement orders.

THE ARTILLERY AISLE: ART.AUCHAN TARGETS RUSSIA'S GUN LINE

On July 7, Ukraine's Lasar's Group disclosed the results of [Art.Auchan](#), a coordinated drone operation conducted during two nights in June against Russian artillery across several frontline sectors. **Ukrainian forces reported striking 231 artillery systems and destroying 171, an amount the unit compared to approximately 10–14 artillery battalions, or around three brigades' worth of guns.** The figures are Ukrainian operational assessments and have not been independently verified in full.



A target being hit. Screenshot from a video
Source: [Lazars Group](#)

The operation involved approximately 800 strike drones.

Before the attacks, Lasar's Group and neighboring units collected and consolidated intelligence on Russian artillery positions across the Kherson, Zaporizhzhia, Donetsk, and Starobilsk directions. Strike missions were then coordinated around this target set rather than conducted as isolated attacks by individual crews.

Lasar's Group also employed a specially developed munition intended to disable howitzers by damaging their barrels. This focus matters because artillery does not always need to be completely destroyed to be removed from combat: damage to the barrel, fire-control equipment, or mobility system can force the weapon into lengthy repair and interrupt the supporting unit's operations.

According to Ukraine's Defense Forces, **Russian activity in the affected sectors fell by 30% to 81% during the first day after the strikes.** Although the duration of this reduction is unclear, the reported result illustrates the operational purpose of concentrating hundreds of drones into a brief window: not simply accumulating destroyed equipment, but temporarily reducing enemy fire across a wider section of the front.

949 TARGETS DESTROYED OR HIT, WORTH OVER \$500 MILLION					
	Air defense systems	15		Engineering equipment	16
	EW	16		Radar	1
	Tank	103		TOS-1A "Solntsepyok"	1
	SP artillery	17		BM-21 Grad MLRS	7
	AFV	224		ZU-23-2	1
	Trucks/light vehicles	432		UAV ground control station	15
	Fuel tanker	16		Other targets	85

List of all targets hit by the initial phase of Operation Art.Auchan. Source: [UNITED 24](#)

Art.Auchan was the artillery-focused continuation of the [broader Auchan campaign](#), which began in 2025 with attacks on armor, vehicles, and logistics more than 50 kilometers behind the line of contact. Ukrainian reporting attributes 949 targets to the earlier phase and 231 to Art.Auchan, bringing the combined total to 1,180 targets hit.

The earlier operation reportedly used nearly 1,000 drones and delayed a planned Russian mechanized assault for several months.

RIGHT ON SCHEDULE: UKRAINE'S 40-DAY CAMPAIGN LINKS DEEP STRIKES, MIDDLE STRIKES, AND MARITIME INTERDICTION

On June 25, President Volodymyr Zelenskyy approved a [40-day Security Service of Ukraine campaign against Russia](#), formally described as an operation intended to influence the aggressor state and pressure Moscow toward ending the war.

Rather than a single, narrowly defined mission, the campaign has developed into an umbrella for several overlapping efforts: long-range strikes on Russia's economic and military depth, middle strikes against logistics and command infrastructure in occupied territory, and maritime attacks on vessels supporting Russian oil exports and military supply chains.

During the [first reported week](#), the SBU targeted Russia's oil-processing, transportation, and export network. A Sea Baby maritime drone struck the sanctioned Suezmax tanker Blue near occupied Yalta, hitting its stern despite an attempted interception by Russian aircraft.

On land, **at least eight strike drones hit the Cherkasy oil pumping station in Bashkortostan**, a Transneft-Ural node handling almost 2 million tonnes of petroleum products annually.

Strikes also caused fires at the Krasnaya Zvezda and Stavropolskaya oil depots and hit a fuel tank and pumping station at the TES-Terminal-1 facility in occupied Kerch.

Further attacks reached the Yaroslavl refinery and the Yaroslavl oil pumping station, as well as the Vysotsk maritime terminal in Leningrad Oblast, where the SBU reported damage to two loading arms and three fuel tanks. A separate strike caused a fire at the First Plant refinery in Kaluga Oblast. Taken together, the targets covered several stages of the oil chain: refining, inland transportation, storage, and maritime loading.

Military targets were attacked closer to the front. At Gvardeyskoye airfield in occupied Crimea, three hangars containing aviation equipment were hit. The SBU also reported damaging a Pantsir-S2 air-defense system near Simferopol and a Russian mobile fire group in Kerch. In occupied Donetsk Oblast, strikes near Kurakhove and Hranitne destroyed storage sites containing drones, warheads, and ground-control stations used by Russian unmanned-systems units. A large-caliber ammunition depot in Sorokyne, occupied Luhansk Oblast, was also hit, triggering a prolonged secondary detonation.



Targets hit during the week of July 13-19. Source: [SBU](#)

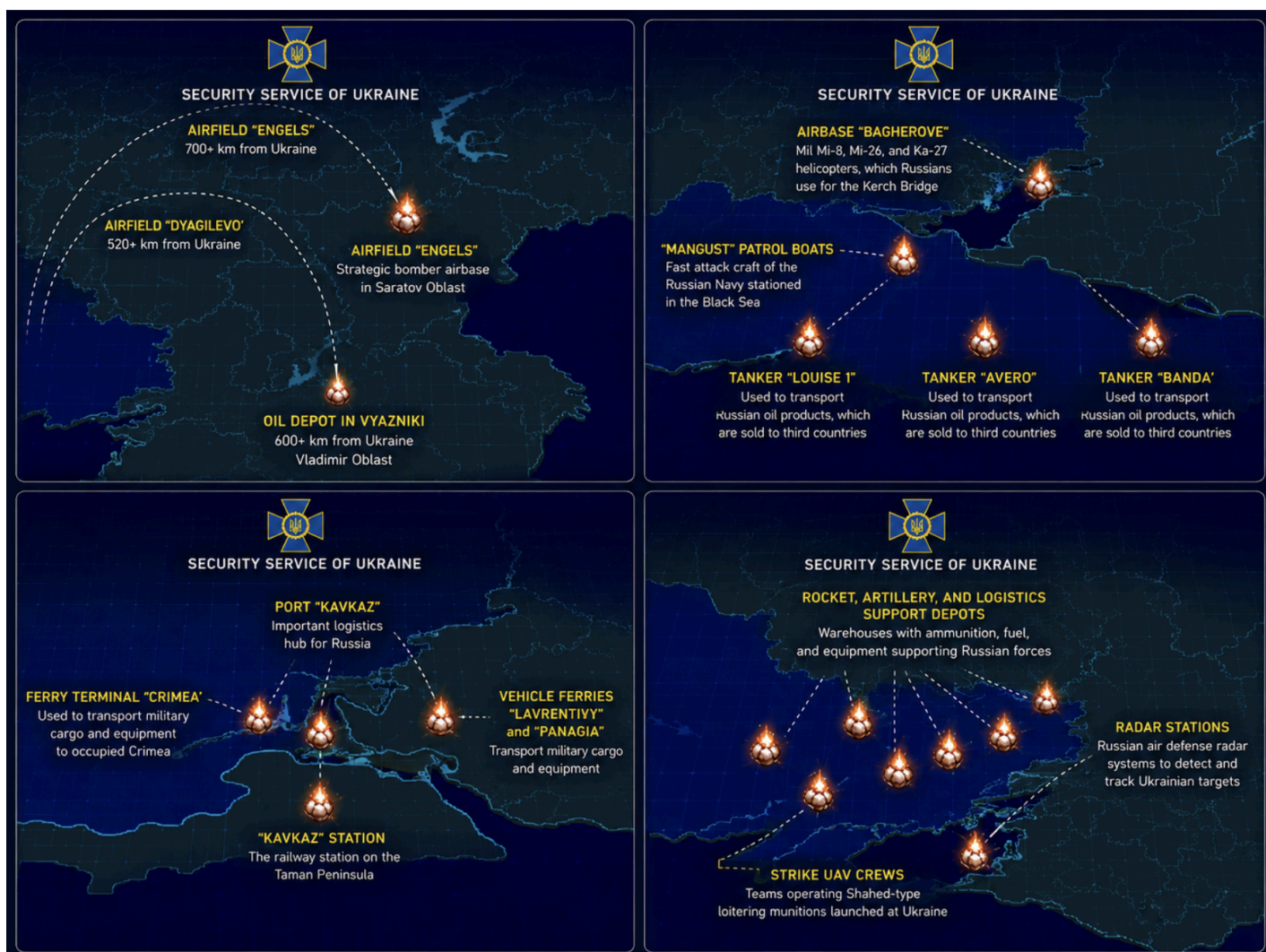


During the second week, the campaign expanded against Russia's strategic aviation. SBU drones traveled approximately 800 km to Engels airbase in Saratov Oblast, where Ukraine reported destroying a Tu-95MS strategic bomber. According to the SBU assessment, the aircraft sustained critical damage, including the complete loss of its tail section. These bombers serve as launch platforms for cruise-missile attacks against Ukraine, making their destruction more difficult to replace than damage to airfield infrastructure alone.

Maritime drones also struck three sanctioned Suezmax tankers used to transport Russian oil. The targeted vessels were Louise 1, which reportedly carried almost 3 million tonnes of Urals crude in 2026, Banda, which operated from Ust-Luga, Kerch, Novorossiysk, and Nakhodka, and Averro, which transported Russian oil to markets including China and India. Two Project 12150 Mangust patrol boats were also reported destroyed in the Black Sea.

In occupied Crimea, drones hit hangars containing military equipment at Bagherove airbase. The SBU also reported destroying three stationary radar systems used to detect Ukrainian maritime and aerial drones. Across occupied Zaporizhzhia, Donetsk, and Kherson oblasts, strikes targeted UAV crew positions, drone warehouses, assembly personnel, workshops, repair facilities, military transport parks, and logistics depots. Missile and artillery storage sites were additionally hit in occupied Crimea and Luhansk Oblast.

The week's attacks also targeted the Kerch–Kavkaz logistical corridor. At Port Kavkaz, drones hit three petroleum storage tanks and the vehicle ferries Lavrentiy and Panagia. At the Crimea ferry terminal in Kerch, the ferries Yeysk and Maria were struck. A railway train carrying fuel tanks was also hit at the Kavkaz freight station. Separately, **an oil-storage facility in Vyazniki, Stavropol Krai, approximately 600 km from Ukraine, was attacked.**



Targets hit during the week of July 6-12. Source: [SBU](#)



During the third reported week, the campaign expanded into the Caspian Sea and placed greater emphasis on Russian air defenses, military logistics, and energy infrastructure. The SBU reported striking a Project 12418 Molniya missile boat, two sanctioned cargo vessels used on the Iran–Russia supply route, and an oil-production platform at the Filanovsky field.

In Rostov-on-Don, drones reportedly hit a 92N6E Grave Stone radar and antenna tower belonging to an S-400 system, while a Tor-M2 air-defense system and Pole-21 electronic-warfare complex were destroyed. Additional attacks damaged a Nebo-U long-range radar at Belbek airfield, a fuel tank at Saki airfield, and UAV warehouses and workshops in occupied Crimea and Donetsk Oblast.

The campaign also continued against Russia's fuel network. Long-range drones traveled approximately 1,350 km to strike the Subkhankulovo oil pumping station in Bashkortostan and about 900 km to hit the Novospassky mini-refinery in Ulyanovsk Oblast. The First Plant refinery in Kaluga Oblast was targeted again.

Closer to the front, 13 SBU drones struck an FSB coordination center in occupied Kherson Oblast, where Ukrainian authorities assessed that around 100 personnel may have been present. Other FSB deployment sites in occupied Kherson and Donetsk oblasts were also targeted.

Across the three reported weeks, the campaign has widened both geographically and operationally. The first week concentrated on Russia's oil-processing, storage, and export network; the second added strategic aviation, sanctioned tankers, radar systems, and the Kerch–Kavkaz transport corridor; the third extended strikes into the Caspian Sea while targeting the Iran–Russia supply route, offshore energy infrastructure, S-400 components, electronic warfare, and FSB command locations. The pattern shows deep and middle strikes functioning as parts of one campaign: deep attacks impose economic and strategic costs, while strikes closer to the front disrupt air defense, fuel, command, drone infrastructure, and military logistics. Most damage assessments remain based on official Ukrainian reporting and may be revised as satellite imagery, commercial data, and additional evidence become available.



Targets hit during the week of July 20-26. Source: [SBU](#)

WHEN THE SHIELD FAILED: SKYNEX FACES ITS FIRST PUBLIC BATTLEFIELD TEST

In July, German media reported that Ukraine's [Skynex cannon-based air defence system failed to intercept a Russian strike drone during an attack](#) on an industrial facility in western Ukraine on April 1, 2026. The account is based on an internal Ukrainian military report obtained by Stern and has not been published independently.



Skynex anti-aircraft gun in service with the Armed Forces of Ukraine

[The protected site reportedly had two Skynex batteries,](#) comprising eight 35 mm gun modules, two X-TAR3D radars, and two command posts. During the attack, the radars detected two drones at approximately 20 km, with one target entering an engagement zone covered by at least two guns. Only one shot was reportedly fired and missed before the drone struck the facility.

The report attributed the failure to a combination of tracking problems and technical faults. Within several minutes, three of the eight guns reportedly became unavailable because of hydraulic defects, radar-tracking failures, and ammunition-feed malfunctions; only two guns were said to have maintained reliable target tracking. The Ukrainian assessment reportedly described the system as having low operational readiness and failing to meet the manufacturer's stated performance.

Rheinmetall declined to discuss specific operational data but stated that [Skynex had demonstrated strong effectiveness in Ukraine.](#) The company advertises the system as a networked short-range air-defence solution using 35 mm programmable AHEAD ammunition, with the Revolver Gun Mk3 offering a firing rate of about 1,000 rounds per minute and an effective range of up to 4 km. Germany had delivered two Skynex systems with ammunition to Ukraine by April 2025.

UKRAINE REBUILDS THE STRELA-10 FOR THE DRONE WAR

In early July, Ukraine publicly [revealed Rif](#), an experimental short-range air-defense system developed through a deep modernization of the Soviet Strela-10.

Originally designed in the 1970s to protect frontline forces from aircraft and helicopters, **Strela-10 systems are now used primarily against Russian reconnaissance and strike drones**—targets their original missiles were not optimized to engage.

The main change is the guidance system. Standard Strela-10 missiles use an infrared seeker and operate on a fire-and-forget principle. Rif instead employs a laser-guided missile, requiring the crew to track and illuminate the target until interception.

This makes the system less dependent on the weak thermal signatures of small UAVs, which are often difficult for legacy infrared seekers to acquire.

[According to NV's sources](#) in Ukraine's Ground Forces, Rif currently demonstrates a 35–40% higher engagement effectiveness than the standard Strela-10, measured as the ratio between missiles launched and aerial targets destroyed. The improvement reportedly applies primarily to UAV interception. The article's headline refers to a threefold increase, but the detailed assessment in the report gives the more conservative 35–40% figure.

The trade-off is crew workload. An experienced instructor said a standard Strela-10 crew could learn the basic engagement process within several hours, while Rif requires substantially more training in target acquisition, guidance, and continuous tracking.

Its effectiveness may therefore improve as crews gain experience, but the system is more operator-dependent than the original launcher.

[Ukraine reportedly had up to 150 Strela-10 systems at the beginning of 2022](#), alongside additional launchers restored from storage or received from partners.

Combined with Ukraine's existing experience producing laser-guided missile systems, this creates a potential pathway for converting part of the remaining Soviet inventory into a more relevant counter-UAV capability.

Whether Rif can be produced and deployed at scale remains unclear, but the project demonstrates how Ukraine is adapting legacy air-defense assets to threats they were never designed to defeat.



Modernized Strela "Rif" anti-aircraft missile system

DROP, GUIDE, STRIKE: FIREFLY GIVES UKRAINIAN BOMBER DRONES PRECISION

On July 20, [Ukraine's Ministry of Defence announced that the domestically developed Firefly guided munition](#) had completed testing and was ready for serial production. Designed for Ukraine's heavy multirotor bomber drones, the system is intended to strike dugouts, fortifications, and other protected positions without requiring the carrier drone to hover directly above the target.



The Firefly munition has been tested on Ukraine's main bomber drones. Source: [MoD](#)

After release, Firefly autonomously calculates and corrects its trajectory toward the designated point, maintaining guidance under enemy electronic-warfare interference. The Ministry lists a maximum release altitude of up to 800 meters, extending the distance between the bomber drone and short-range air defenses, small-arms fire, and enemy FPVs around the target.



FireFly guidance modules. Source: [Defender Media](#)

Earlier reporting described Firefly as a terminal-guidance module already integrated with Vampire, Perun, and other Ukrainian heavy bomber platforms. Its developer claimed an accuracy of approximately 0.5–2 meters from release altitudes of 200–500 meters, depending on the platform, weather, and mission conditions, with potential production capacity of up to [10,000 modules per month](#).

These figures remain manufacturer claims and have not yet been independently confirmed through publicly available combat data.

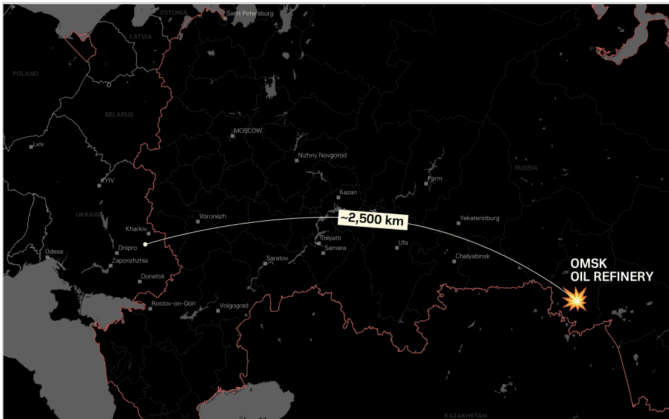
[Serial production](#) will use a licensing mechanism introduced by Cabinet Resolution No. 1310 in October 2025. It allows the Ministry of Defence to transfer state-owned technologies to private defense manufacturers, including companies within the Brave1 ecosystem, rather than relying on a single production line.

During the first half of 2026, the Ministry authorized 1,184 new weapons and equipment models, **more than 90% of them Ukrainian-made**, including over 200 types of ammunition.

Firefly addresses a central limitation of reusable bomber drones: they can carry heavier payloads than FPVs but traditionally require closer and more predictable approaches to achieve accuracy. Adding autonomous correction turns them into precision-strike carriers while reducing exposure during the final attack phase. The next measure of the system's value will be whether the licensing model converts the stated production capacity into sustained battlefield supply.

BEYOND THE URALS: FP-1 EXTENDS UKRAINE'S DEEP-STRIKE REACH

On July 6, [Ukrainian Special Operations Forces struck the Omsk oil refinery in western Siberia](#)—the first confirmed Ukrainian attack on the facility and the deepest publicly acknowledged strike of the full-scale war. The target lies more than [2,500 km from Ukraine's border](#), while Ukrainian officials said the drones may have covered up to 3,000 km along their actual flight route. Russian regional authorities confirmed the attack and a fire at the refinery.



Map of the FP-1 drone strike on the Omsk oil refinery in Russia. Source: [UNITED24 Media](#)

The strike reportedly used a modernized version of [Fire Point's FP-1 long-range drone](#).

According to the manufacturer, the updated platform can reach up to 3,400 km, compared with roughly 1,600 km for the original version. Fire Point described the mission as a distance record for a one-way strike drone, although the exact route and technical configuration have not been independently disclosed.



FP-1 attack drone during the attack on the Omsk refinery. Source: [Militarnyi](#)

The drones targeted the ELOU-AVT-11 primary crude-processing unit, one of the refinery's most important installations.

The unit processes approximately [8.4 million tonnes annually](#), while the entire Omsk refinery handles around 21–23 million tonnes, or roughly 460,000 barrels per day, making it Russia's largest refinery and a major producer of gasoline, diesel, and aviation fuel. Damage to primary processing can reduce the supply of feedstock to downstream units even when the wider facility remains operational.

Omsk had previously remained outside the demonstrated reach of Ukrainian strike systems and was one of only two facilities among Russia's ten largest refineries never previously attacked. Its location beyond the Urals had made it a potential reserve source for compensating for production losses elsewhere during Russia's developing fuel shortages. Following the Omsk strike, Angarsk reportedly remains the only refinery in this group not yet reached.

The upgraded range comes with trade-offs: long-range drones must carry more fuel, leaving less capacity for the warhead, while their relatively low speed makes them vulnerable to air defense and electronic interference.

Their main advantage is cost and scale. If the FP-1's claimed range is sustained in repeated operations, much of Russia's refinery and defense-industrial infrastructure beyond the Urals can no longer be treated as geographically protected.

SEA TO SHORE: UKRAINE'S FIRST ROBOTIC AMPHIBIOUS ASSAULT

On July 13, Ukraine's 123rd Separate Territorial Defense Brigade announced the first known combat mission in which an **unmanned surface vessel transported and deployed an armed ground robot** onto enemy-held territory.

The operation took place on the occupied Kinburn Spit, where the maritime platform crossed the Black Sea, approached the shoreline, and released the UGV to conduct a combat mission behind Russian positions—without placing Ukrainian personnel on the ground.



An unmanned surface vessel lands an armed ground robot on the occupied Kinburn Spit during a Ukrainian combat operation. Source: [123rd Separate Territorial Defense Brigade](#)

The specific ground platform was not officially identified. Initial reporting suggested a Ukrainian Rys-series UGV, while subsequent information indicated that the robot carried DevDroid's Wolly 7.62 remotely operated weapon station, built around a KT-7.62/PKM-pattern machine gun.

The module reportedly combines remote observation, AI-assisted target acquisition, and **an effective engagement range of up to 1,000 meters**. Released footage showed the robot leaving the carrier and firing at a target, although the resulting damage was not disclosed.

The Kinburn Spit is particularly suited to this type of experimentation. Russian surveillance, artillery, drones, and fortified positions make a conventional landing highly dangerous, while its sandy coastline allows a maritime carrier to deliver a relatively small tracked or wheeled platform directly onto occupied territory. The mission effectively transformed the USV from a strike weapon into a reusable transport and deployment platform for another unmanned system.

The operation also represents a new level of cross-domain integration. Ukraine has already used UGVs for logistics, casualty evacuation, engineering work, reconnaissance, and direct fire support. Delivering one by sea expands their potential use to raids, reconnaissance, fire missions, and the insertion of sensors or supplies in coastal areas where personnel deployment would carry disproportionate risk.

The concept remains early-stage. Its practical value will depend on reliable communications, maritime navigation, beach mobility, recovery options, and the ability of both platforms to survive Russian detection and electronic warfare. No information has been released on the distance traveled, mission duration, or whether the UGV was recovered.

Still, if scaled, **the approach could establish a new robotic amphibious layer in which unmanned vessels act as carriers for ground systems** rather than operating only as reconnaissance or kamikaze platforms.

FLEET STOP: UKRAINE'S "MOLOCHKA" CAMPAIGN CHOKES RUSSIAN SHIPPING

On July 6, Ukraine's Unmanned Systems Forces launched [Operation "MoLoCHKa"](#), a concentrated campaign against vessels supporting Russian military logistics and sanctions-evasion exports in the Black Sea and Sea of Azov. The primary targets are not only large shadow-fleet tankers, but also the smaller feeder vessels that transport oil, fuel, and cargo from Russian ports and transfer it to larger ships near the Kerch Strait.

By July 18, Ukrainian forces reported striking **172 vessels in 13 days**: 118 in the Sea of Azov and 54 in the Black Sea. **During the July 18 attack alone, drones hit another 13 vessels**—eight dry-cargo ships, one oil tanker, one gas tanker, one tugboat, and two floating cranes. Earlier waves included tankers, bulk carriers, ferries, and support vessels operating around the Kerch Strait and Russian ports.

The campaign is designed to disable rather than sink vessels. Ukrainian commanders stated that drones aim to leave ships unable to navigate or communicate while avoiding hull breaches that could cause large oil spills.

This allows relatively low-cost unmanned systems to remove vessels from service, force repairs, raise insurance risks, and disrupt port schedules without attempting to destroy every ship completely.



Defeat of the Shadow Fleet during the operation on July 12. Source: [Reuters](#)



Map of damage during the night of July 18. Source: [Madyar](#)

The immediate effect has been a sharp decline in Russian maritime activity. According to satellite-based estimates cited by Ukrainian media, the number of active vessels in the Sea of Azov fell from 132 before the operation to 43 by July 13, a reduction of approximately **67% in one week**. Shipping through the Kerch Strait and the Sea of Azov was subsequently restricted, forcing Russia to consider rerouting grain and other exports through Black Sea or Baltic ports.



Number of Russian vessels in the Sea of Azov before 6.07 and after 12.07. Source: [Oko_Gora](#)

The wider objective is to isolate occupied Crimea and weaken Russian forces in southern Ukraine. The feeder fleet had become an alternative to damaged ferry routes and exposed road and rail corridors, supplying fuel and materiel while supporting offshore oil transfers to larger shadow-fleet tankers. **By targeting this intermediate maritime layer, Ukraine is attacking the connective system between Russian ports, Crimea, and the southern front rather than individual ships alone.**

Economic assessments remain preliminary. One Ukrainian analyst estimated that Russia's weekly maritime-export revenue **declined to \$1.068 billion, approximately \$200 million below the previous week**; this does not mean Russia lost more than \$1 billion directly from the strikes. The same assessment cited Russian oil output of around 8.9 million barrels per day, roughly 830,000 barrels below its OPEC quota, although the proportion attributable specifically to Operation "MoLoCHKa" cannot yet be independently established.

The campaign demonstrates a new use of unmanned systems at operational scale: sustained attacks against an entire transport network rather than isolated high-value warships. If Russia cannot restore regular traffic, the pressure will extend beyond oil exports to grain, fuel, military supplies, and the broader logistics sustaining its southern grouping.

EXPORTING THE DRONE FLEET: UKRAINE'S MAGURA MOVES INTO U.S. PRODUCTION

On July 22, Ukrainian developer UFORCE and U.S. military boat manufacturer RECONCRAFT announced an [agreement to produce the MAGURA family of unmanned surface vessels in the United States](#). It will be the first time that an American manufacturer produces a maritime drone designed and combat-tested by Ukraine.



MAGURA V5, V6, and V7 unmanned surface drones on display at the National Museum of the History of Ukraine in the Second World War in Kyiv, September 18, 2025.

Source: [UNITED 24](#)

The memorandum was signed at the Ukrainian Embassy in Washington. Production is planned at RECONCRAFT facilities in Oregon and South Carolina, with both companies expected to contribute personnel, equipment, materials, and technical expertise.

The long-term objective is to manufacture hundreds—and potentially thousands—of MAGURA platforms annually, although no production schedule or confirmed U.S. procurement volume has yet been disclosed.

MAGURA was initially developed for maritime reconnaissance and strike missions and has been credited with helping push much of Russia's Black Sea Fleet away from occupied Crimea. **The platform's significance, however, increasingly extends beyond one-way attacks.**

Newer variants can reportedly launch aerial drones, tow sonar equipment, support mine-countermeasure and anti-submarine missions, and, in the case of the MAGURA V7, engage airborne targets.

[The U.S. military had already tested MAGURA V5 vessels during the Balikatan exercises in the Philippines in April 2026](#). During the live-fire demonstration, U.S. special operations forces applied tactics developed in the Black Sea and used the vessels against a decommissioned target ship. The subsequent manufacturing agreement suggests that Washington is moving beyond observing Ukraine's maritime-drone experience toward incorporating parts of it into the U.S. defense-industrial base.



US military tested Ukrainian Magura V5 naval drones for the first time during April exercises in the Philippines.

Source: [UNITED 24](#)

For the United States, domestic production offers a faster route to fielding a combat-proven autonomous vessel than beginning an entirely new development program.

For Ukraine, the partnership could expand production capacity, strengthen supply-chain resilience, and establish MAGURA as an exportable family of systems rather than a platform manufactured only for the Black Sea theater. The agreement remains an initial memorandum rather than proof of mass production. Its strategic importance will therefore depend on whether it leads to funded orders, successful technology transfer, repeatable manufacturing, and integration into U.S. naval concepts.

Even so, the deal marks a notable reversal of the traditional defense-technology relationship: instead of Ukraine adapting an established Western system, **an American manufacturer is preparing to industrialize a weapon shaped by Ukrainian combat experience.**

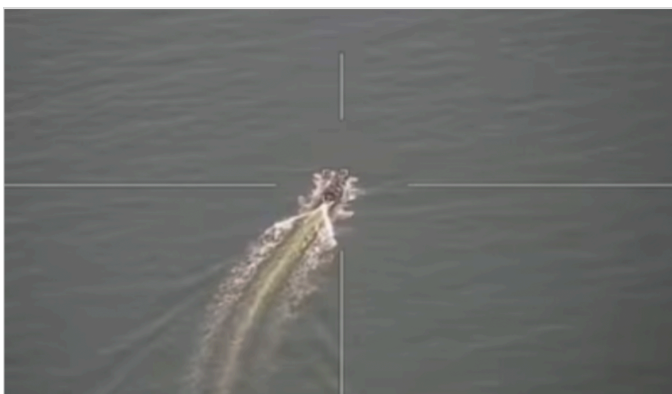
THE BOAT BECOMES A CARRIER: BARRACUDA LAUNCHES FPV STRIKES FROM THE WATER

On July 19, Ukraine's 40th Separate Marine Brigade reported the [first publicly disclosed combat use of FPV drones launched from Barracuda unmanned surface vessels](#). The operation targeted Russian positions near occupied Zaliznyi Port in Kherson Oblast, extending the role of Ukrainian naval drones beyond reconnaissance and direct one-way attacks.



Barracuda unmanned surface vessel.
Source: [40th Marine Brigade](#)

As the Barracuda vessels moved toward their designated launch area, Russian forces attacked them with loitering munitions. [According to the brigade](#), four Lancet drones were used to destroy one of the boats. The remaining vessels nevertheless reached the launch point and continued the operation.



Lancet drone attacks Barracuda.
Source: [40th Marine Brigade](#)

After conducting additional reconnaissance, Ukrainian operators launched FPV drones from the surviving boats. [The strikes reportedly hit Russian logistics and military equipment, concealed positions, and concentrations of personnel near Zaliznyi Port](#). The reported results remain Ukrainian operational claims and have not been independently verified in full.



FPV drone takes off from a barracuda.
Source: [40th Marine Brigade](#)

The operation turns the Barracuda into a small maritime drone carrier. Instead of requiring FPVs to fly the entire distance from Ukrainian-controlled territory, an unmanned boat can transport them closer to the coast and provide a mobile launch point. This can extend their practical reach, reduce the time they spend crossing exposed airspace, and allow attacks from directions that coastal defenses may not expect.

The concept also introduces new vulnerabilities. A carrier vessel is slower and more visible than the FPVs it transports, while waves, communications interruptions, and damage to the launch system can threaten the entire mission. Losing one vessel may also mean losing several smaller drones at once. The destruction of one Barracuda by Lancets therefore demonstrates both the platform's exposure and the value of deploying several vessels: the loss of a single carrier did not prevent the remaining boats from completing the strike.

MORE SATELLITES, STILL NO NETWORK: RUSSIA EXPANDS RASSVET

On July 20, [Russia's Bureau 1440](#) confirmed that a second batch of Rassvet low-Earth-orbit communications satellites had been placed into orbit. [According to Serhii "Flash" Beskrestnov](#), an adviser to the President of Ukraine on defense technology, the launch increased the constellation to up to 40 satellites, although the exact number in the new batch was not officially disclosed. The spacecraft are still moving toward their intended orbital positions.



Illustration of the operation of Russian satellites "Rassvet" from the company "Bureau 1440". Source: [Militarnyi](#)

The shift to geostationary terminals follows directly from the Starlink blockade. Russia's previous satellite systems relied on antennas up to 90 cm in diameter, making them a noticeable target for Ukrainian drones. **The Spirit-030 cuts that figure by two-thirds:** it is a portable satellite internet terminal with a 30–35 cm foldable dish, likely connecting through the Ekspress and possibly Yamal satellite series, which makes detection significantly harder.

The launch follows the [first operational deployment of 16 satellites on March 23](#). One of those spacecraft was subsequently lost, leaving 15 operational satellites alongside six earlier experimental platforms. The satellites use Bureau 1440's domestic platform and incorporate 5G NTN communications, inter-satellite laser links, plasma propulsion, and phased-array user terminals, marking Russia's transition from isolated technology demonstrations toward building an operational broadband network.

Rassvet is promoted as Russia's alternative to Starlink, with claimed user speeds of up to [1 Gbps and latency of approximately 70 milliseconds](#). However, the current constellation remains too small to provide continuous military coverage. Beskrestnov assessed that Russia would need at least several hundred satellites before the system could meaningfully support military command, control, and communications.

[Bureau 1440 plans to deploy more than 250 satellites by 2027](#), when commercial service is expected to begin, and expand the constellation beyond 900 satellites by 2035. The project is supported by 102.8 billion rubles in federal funding, with the company planning an additional 329 billion rubles in investment by 2030. Even at that scale, Rassvet would remain far smaller than Starlink, but it could provide Russia with an independent communications layer for forces, aircraft, ships, and unmanned systems.

The program gained greater military urgency after Ukraine and SpaceX introduced verification measures that blocked unauthorized Starlink terminals used by Russian forces. Rassvet is not yet a battlefield substitute, but the second launch demonstrates that Russia is steadily converting lessons from the war into sovereign satellite infrastructure. Its progress, ground-terminal production, and eventual integration with drones and military command networks remain developments to monitor.

BREAKING THE ARRAY: LIMA QUANT COUNTERS RUSSIA'S NEXT-GENERATION NAVIGATION ANTENNAS

In July, [Ukraine unveiled Lima Quant](#), a modernized electronic-warfare system designed to suppress Russia's latest controlled reception pattern antennas, or CRPAs. These multi-element arrays are installed on Russian drones, guided bombs, and missiles to reject interference and preserve access to satellite navigation. Ukrainian specialists reportedly developed the upgrade in approximately three months after newer Russian antennas began overcoming previous-generation jammers.

Earlier Lima systems followed a largely numerical contest: defeating a four-element CRPA required approximately four jammers, while an eight-element antenna required eight. Russia's redesigned antennas broke that relationship. [According to the system's operators](#), suppressing one upgraded eight-element array required 19 older Lima systems, while a 16-element version resisted as many as 104. Lima Quant has reportedly passed testing against both 12- and 16-element CRPAs.

Rather than relying on signal power alone, Lima Quant reportedly combines navigation jamming, coordinate spoofing, and additional signals intended to prevent the antenna from locating the source of interference. The system targets satellite-guided weapons ranging from Shahed drones and guided glide bombs to Kh-101, Kalibr, KN-23, Kh-47 Kinzhal, and Zircon missiles.

[According to Alkhimik](#), commander of Ukraine's Night Watch electronic-warfare unit, Lima systems now account for approximately half of all Russian aerial targets suppressed by Ukrainian EW, including both drones and missiles. [Separate reporting indicates](#) that Lima platforms also constitute more than 90% of the Pokrova strategic electronic-warfare network, demonstrating that the system has already moved beyond limited trials and become a central component of Ukraine's non-kinetic air defense. These figures remain based on the unit commander's operational assessment.

The unit has also credited Lima with [disrupting 61 Kh-47 Kinzhal missiles](#), reportedly forcing their navigation systems into destabilizing maneuvers or diverting them from intended targets. The result has not been independently verified in full, but it illustrates the potential cost advantage of electronic suppression: one EW network can repeatedly engage threats that would otherwise require scarce multimillion-dollar interceptor missiles. Lima currently covers an estimated 15–20% of Ukrainian territory, while nationwide protection is assessed to require around \$1 billion.



Part of the new Russian 16-element CRPA antenna
Source: [UNITED24 Media](#)

BREAK THE SIGNAL: RUSSIA TARGETS UKRAINE'S MEDIA INFRASTRUCTURE

In July, the [Security Service of Ukraine identified domestic media organizations as one of Russia's priority cyber targets](#). The objective extends beyond temporarily disabling websites: Russian operations seek to disrupt broadcasting, seize trusted platforms, and publish propaganda under the identity of established Ukrainian outlets. Since February 2022, the SBU reports neutralizing more than 16,000 cyberattacks and critical cyber incidents targeting government institutions, financial organizations, defense structures, and the media.

[During one attack in 2026](#), a Russian-controlled botnet conducted a three-hour DDoS campaign against an unnamed national television channel, generating up to 200,000 requests per minute from compromised devices in Asia, Europe, and the United States. The attack focused on the application layer, imitating legitimate user activity to overload the channel's servers, but Ukrainian specialists contained it without taking the website offline.

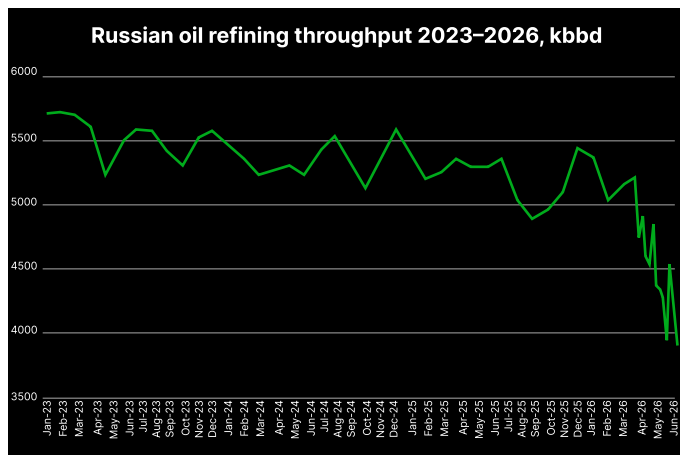
[A separate operation against a major Ukrainian television group](#) began with phishing and simultaneous attempts to penetrate connected infrastructure. The intended final stage was not data theft alone but control of the broadcaster's platform, enabling Russia to distribute propaganda disguised as authentic Ukrainian reporting. The intrusion was detected before the attackers could reach that objective.

The attacks form part of a broader campaign. Ukraine's State Service of Special Communications previously documented more than [200 successful Russian cyberattacks against Ukrainian media](#) since the beginning of the full-scale invasion, using phishing, DDoS attacks, website defacement, destructive malware, account compromise, and fabricated content. The cyber effort increasingly overlaps with physical attacks on studios, communications towers, and broadcasting infrastructure, placing Ukraine's information environment under pressure in both the digital and physical domains.

Ukraine is responding by moving from incident response toward distributed resilience. **In 2026, an SBU and National Council training program reached nearly 450 media professionals across 21 regions**, teaching local outlets to identify threats, protect digital resources, and maintain operations during attacks. The central lesson is that media cybersecurity has become part of national defense: compromising a trusted outlet can provide Russia with an information effect even when the underlying military situation remains unchanged.



RUSSIAN FUEL CRISIS: THE STRATEGIC SUCCESS OF UKRAINIAN DRONES



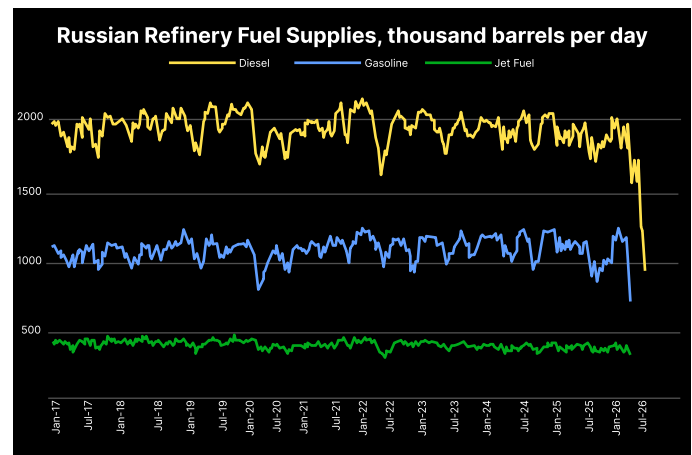
Russian oil refining throughput 2023–2026

Source: [Sergey Vakulenko](#)

Ukraine's deep-strike campaign has entered a qualitatively new phase, with the emergence of a sustained strategic bombing campaign. **Throughout 2025, Ukraine increased long-range drone production by roughly six times**, while manufacturing capacity and operational tempo continued to accelerate throughout 2026. Compared with the summer of 2025, the average monthly launch rate of long-range strike drones increased by **approximately 2–2.5 times**, while the largest individual strike packages became roughly 3–5 times larger.

Most importantly, the number of successful strikes against Russian oil refineries **increased by approximately elevenfold** compared with the same period of the previous year. **By early July 2026, according to the General Staff of the Armed Forces of Ukraine, repeated attacks had temporarily disabled 42.74% of Russia's installed refining capacity.**

During the preceding month alone, eight refineries were successfully attacked, more than sixty large storage tanks containing crude oil and refined petroleum products were destroyed or critically damaged, and cumulative economic losses to the Russian refining sector since August 2025 were estimated at approximately \$13.5 billion.



Weekly Russian Refinery Fuel Supplies

Source: [The Commodity Compass](#)

Ukraine has transitioned to an almost continuous campaign of attrition in which multiple facilities are attacked simultaneously across Russia. This approach prevents Russia from concentrating its air-defense assets, forces the dispersal of defensive resources across an enormous geographical area, and significantly reduces the time available to repair damaged facilities before the next wave of attacks arrives.

More importantly, Ukraine appears to have identified one of Russia's few genuine strategic vulnerabilities. Oil refineries are exceptionally difficult to destroy completely, but they are equally difficult to keep operating once technologically sophisticated equipment suffers repeated precision attacks. Every successful strike shortens the recovery period available to repair organizations, overloads engineering capacity, and steadily reduces the industry's ability to restore itself. **The cumulative effect becomes considerably greater than the damage inflicted by any individual attack.**

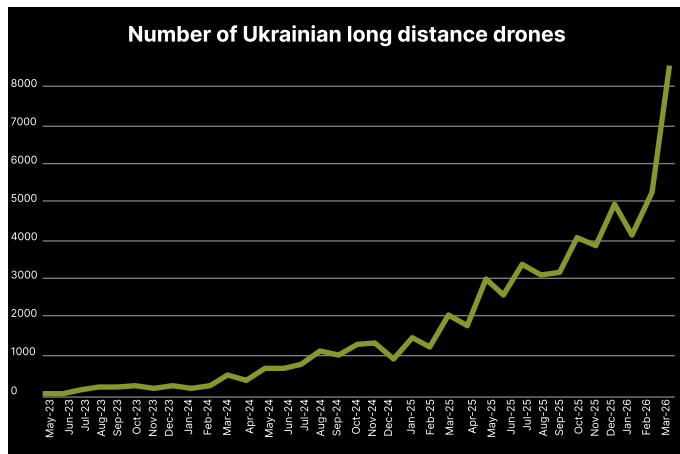
The vulnerability of Russian refineries is largely the result of structural developments that long predate the war. Soviet refinery design standards required major processing units to be separated by considerable distances in order to prevent cascading damage during potential air attacks. Although this reduced efficiency and increased construction costs, it also improved wartime survivability.



Following 2010, however, Russia undertook a large-scale modernization of its refining industry. The principal objective was not to increase gasoline production but to maximize diesel output for export to European markets.

Many refineries replaced dispersed Soviet-era installations with compact, highly integrated processing complexes that reduced operating costs, simplified maintenance, improved energy efficiency, and optimized land use. These changes made excellent commercial sense during peacetime.

Under wartime conditions, however, they significantly reduced resilience. Damage to only a handful of closely integrated processing units can now disable a disproportionately large share of a refinery's productive capacity.



Monthly Number of Ukrainian Long-Range Drones
Source: [Clément Molin](#)

Successful strikes against the Moscow Oil Refinery in Kapotnya illustrate this transformation. During a major modernization completed in 2020, the refinery replaced numerous older processing units with two large integrated refining complexes located in close proximity. This redesign improved efficiency but simultaneously reduced redundancy. Despite being protected by one of the densest integrated air-defense networks in Russia, the refinery suffered multiple successful drone strikes during June 2026. Repairing this damage presents challenges that extend far beyond the destruction itself. Modern refineries depend upon highly specialized compressors, pumps, heat exchangers, catalysts, instrumentation, proprietary control systems, and advanced processing equipment supplied by a relatively small number of manufacturers.

Although Russia has expanded domestic production and parallel import channels since 2022, replacing sophisticated refinery equipment remains expensive and time-consuming.

Manufacturing capacity for many critical components is inherently limited, while repeated attacks force engineering organizations to repair numerous facilities simultaneously. Spare parts, maintenance personnel, heavy equipment, and specialist contractors must all be shared across an expanding number of damaged sites. Consequently, every additional successful strike reduces not only refining capacity but also Russia's ability to restore that capacity.

The strategic consequences are amplified by the structure of Russia's fuel market. Before the full-scale invasion, Russia produced approximately 80 million tonnes of diesel fuel and about 40 million tonnes of gasoline annually. Nearly one-third of diesel production was exported, whereas more than 90 percent of gasoline was consumed domestically.

Russia consumes more than 100,000 tonnes of gasoline every day, making it one of the world's largest domestic gasoline markets. Replacing these volumes through imports would be exceptionally difficult. The global gasoline market simply lacks sufficient immediately available surplus production capable of replacing millions of tonnes of annual Russian output at short notice.

At the same time, sanctions effectively exclude Russia from many of the world's largest gasoline-exporting markets. Belarus remains the only realistic external supplier, possessing modernized refineries with significant secondary processing capacity. Even if Minsk redirected virtually all available export volumes toward Russia, however, those supplies would likely satisfy no more than roughly one-tenth of Russian domestic demand. Belarus therefore represents a useful supplementary source rather than a strategic solution.

Logistics further constrain any attempt to compensate for lost refining capacity. Russian petroleum infrastructure evolved over decades to export crude oil and refined products rather than import them. Major Baltic and Black Sea terminals, storage facilities, and pipeline systems are optimized for outbound flows. Reversing these logistics on a sufficient scale would require infrastructure that largely does not exist.

Alternative overland supply routes from Central Asia or China face significant limitations in railway capacity, transport distances, costs, and throughput, while the overwhelming majority of Russian gasoline consumption remains concentrated in European Russia, thousands of kilometres from most alternative supply sources.

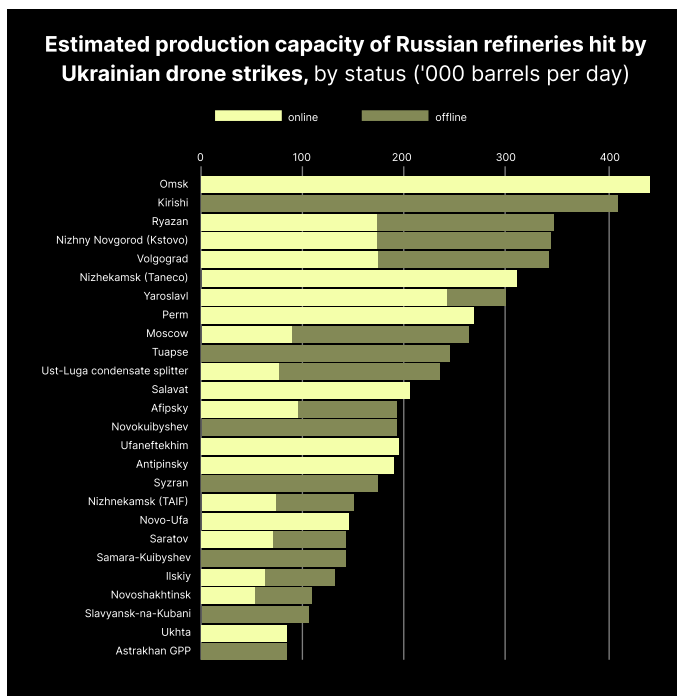


As Ukrainian strikes have intensified, the cumulative consequences have become increasingly visible.

During 2024 and much of 2025, attacks demonstrated that Russian refineries could be reached despite layered air defenses, but the campaign remained episodic and its economic costs, although significant, were broadly manageable.

During 2026, refineries themselves increasingly became the primary targets rather than fuel depots or export terminals. Twenty-six refinery attacks were recorded during April and May alone—the same number observed during August and September 2025, when they contributed to noticeable fuel shortages inside Russia.

The difference is that today's attacks occur within a sustained campaign rather than as isolated episodes, producing considerably more severe cumulative effects.

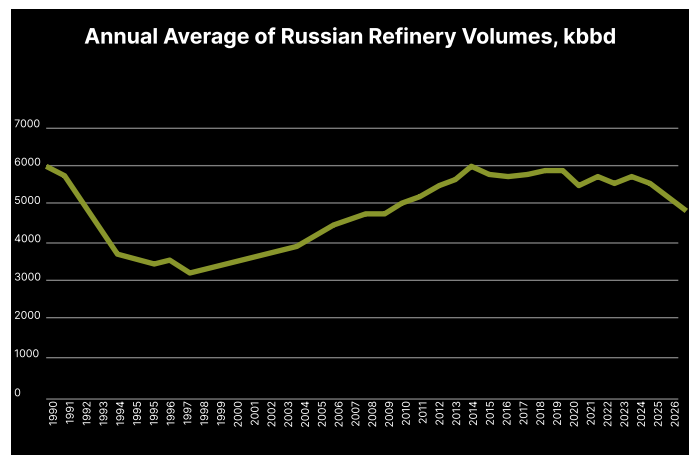


Impact of Ukrainian Drone Strikes on Russian Refining Capacity. Source: [Financial Times](#)

The consequences extend beyond downstream refining. Every tonne of crude oil that cannot be converted into gasoline, diesel fuel, aviation kerosene, or other petroleum products must ultimately be exported or stored. Since the second half of April 2026, Russia's seaborne crude exports have remained approximately 500,000 barrels per day above the average observed between 2023 and 2025. Rather than indicating stronger production, this increase is more plausibly explained by reduced domestic refining activity. Crude oil that cannot be processed must be diverted elsewhere.

However, export capacity is itself constrained by pipeline throughput, port terminals, tanker availability, insurance arrangements, and international demand. These limitations mean that crude exports cannot continue expanding indefinitely. If refinery disruptions persist while export infrastructure approaches practical limits, Russia may eventually be forced to reduce crude production itself because neither refining nor export capacity will be sufficient to absorb total output. At that point, Ukrainian strikes would begin constraining not only refining margins but also upstream production, export revenues, and ultimately the fiscal resources.

Taken together, recent developments suggest that Ukraine has demonstrated the ability to trigger a severe fuel crisis inside Russia within a relatively short period of time—one that Moscow has limited capacity to resolve for a number of structural, technological, and logistical reasons.



Average annual Russian oil refining throughput 1990–2026

Source: [Sergey Vakulenko](#)

Although by late July Ukraine had temporarily reduced the intensity of strikes against oil refineries and shifted its focus toward other categories of strategic targets, allowing the immediate fuel situation in Russia to stabilize somewhat, the resilience of the Russian refining sector is far from unlimited. Should large-scale attacks on refineries resume, Ukraine could once again generate a sustained fuel shortage. **Moreover, the consequences would likely extend beyond gasoline, potentially creating serious disruptions in diesel fuel supplies**—a far more strategically important commodity for both the Russian economy and its military.

Repeated strikes on refineries produce cumulative economic and social consequences: persistent fuel shortages across Russian regions, mounting repair costs, declining refining output, growing dependence on limited external supplies, and potentially even future reductions in crude oil production. Thus far, Russia has demonstrated no effective means of preventing such a campaign.



OLD VS NEW: MISCONCEPTIONS ABOUT TECHNOLOGY AND MILITARY TACTICS IN UKRAINE.

SG T John "Jackie" Roberts, G7, 3rd Army Corps, Armed Forces of Ukraine

Recently a dust-up in Ukraine's top military leadership occurred between Minister of Defense, Mykhailo Fedorov, and Commander-in-Chief of the Armed Forces of Ukraine, General Oleksandr Syrskyi. Fedorov is a young technocrat who has had real success in developing technology and using government reforms to enable Ukrainian success. Syrskyi is a Soviet trained military commander who has real success commanding troops in battle, but with a habit of over-committing forces.

The ideological battle between these two men is a good encapsulation of the challenges of modern high-intensity combat for anyone observing the war in Ukraine. On one side, Ukrainians should be leveraging every possible technological advantage available to them. On the other side, success in battle cannot be had without sacrifice as any two armies will eventually adapt to each other's new technology and tactics.

These two men unfortunately were not able to find the common ground in their approaches. Further, their arguments must not be binaries, but helical parallels; combined to create a synthesis of hard-nosed combat fundamentals enabled by overwhelming technological advantage.

This short article will examine the separate arms of the military, the old fundamentals of war, and how they have been combined with the new technologies emerging on our battlefield in Ukraine.

DRONES

- In Ukraine, **80% of battlefield casualties are inflicted by drones.**
- The remaining 20% of combined arms operations will determine the winner or loser of any battle or campaign.

Drones are best suited to shaping operations, particularly massive attrition of enemy personnel and supplies until they are a manageable size. Ideally you should minimize exposure of your own personnel and supplies while reducing the enemy. **This is why drones are so asymmetrically effective in attritional phases.**

The enemy will adapt.

The Russian adaptation to this has been the "**regeneration phase**," or the ability to recruit, equip and replace losses faster than they can be meaningfully attrited. At this point in the war, Russians don't employ this as a phase so much as a constant regeneration pipeline. At the moment, nobody knows how deep the bottom of this well of men and material extends in Russia.

- Drones can counter and replace mass with mass, reducing human losses.
- Exquisite expensive systems/enablers are meaningless.

For Ukraine, **a massive drone component must always be present** and constantly attriting the enemy while traditional combined arms operations are waiting at a moment's notice to launch into areas where enemy density has dropped. **This constant drone attrition is the driving force behind drone technological development.**

The traditional military commanders aren't interested in running up the scoreboard; they are interested in restoring Ukraine to its normal size via territorial gains. Where Ukrainian military commanders can go wrong is by failing to recognize the **drone attrition phase as a distinct and separate action meant to precede final clearance and holding of territory by traditional combined arms operations.** Instead of maintaining a defense to reduce casualties, they may commit forces on offense at a time and place when enemy force density is too high to justify an attack.

Where Ukrainian drone commanders can go wrong, meanwhile, is by focusing solely on attriting the enemy and failing to support traditional combined arms operations when they are launched. **A drone commander isn't interested in responding to calls for fire under strictly controlled guidelines to prevent fratricide.** It's much better for them to free-fire into enemy territory and run up the scoreboard and gain e-points on the Brave1 marketplace.

Typically, the military commander recognizes the value of drones supporting his own forces. But it's the drone commander who finds it difficult to optimize tactics and training to exclusively support troops on the ground during combined operations. Drones and soldiers end up too often fighting separate battles alongside each other instead of working together.

The answer is to organize drone forces into at least 2 camps.

- Pure drone forces designed for long range attrition similar to massed artillery.
- Close support drone forces designed to work in close proximity to friendly forces.

The US Air Force recognized this problem with conventional air power and created special certifications for pilots to be able to provide close-air-support to ground troops. **For Ukraine, what this often looks like is drone pilots who are nestled in different command levels.** Drone pilots assigned to Ukraine's Unmanned Systems Forces Branch are more like the bulk of the US Air Force. They focus on winning their own battlespace first in order to enable other arms to conduct their operations afterwards.

Drone pilots assigned to Ukrainian Brigades on the ground are dispersed into the platoons and companies which they support. They are highly aware of their own ground troops' plans, positions and actions. Well-supported Brigades will always have an echelon-minus of drones at every level. A platoon will have a drone squad, a company will have a drone platoon, a battalion will have a drone company. At the time of this writing, not all Brigades have done this in an organized way; but very likely they have the equivalent number of personnel who are in-fact conducting the stated drone operations at each level.

One of the friction points in the Ukrainian Military, which is still ongoing, is **properly allocating drone resources to each of these two types of units.** Very often the "pure drone forces" will receive a hefty amount of drones and munitions, while "close-support drone forces" will be overlooked and lost in the logistics rosters of a massive Brigade or Corps.

The Myth that drones can replace soldiers:

- Drones can replace soldiers. Particularly recon, shaping and attrition phases of operations.
- Drones cannot replace soldiers required to clear and hold territory.

One of the most interesting emerging cases on "drones replacing soldiers" is **utilizing unmanned ground drones on defense.** At the moment, 3rd Army Corps is intentionally replicating our success from the winter of 2025 when a ground drone equipped with an M2 Browning held its own sector for 45 days. **This drone effectively engaged and won direct fire gunfights with Russian assault infantry** and prevented the deaths of our own defensive infantry who would have been otherwise required to hold the sector.

In this case, it's not fair to say that the drone "replaced" our soldiers. **Similar to debates around AI and employment, it should be said that a ground crew of soldiers was needed to maintain, reload and recharge the drone during its 45-day operation.** What the drone did replace is the exposure of the soldiers to enemy fire. Much like the original American combat drone, MQ-1 Predator, was initially used to conduct air recon over hostile territory and forgo the need to risk the life of a pilot.

The 3rd Army Corps is working aggressively to reduce the number of our troops exposed to enemy fire by using ground drones. However, we will still need a similar density of soldiers in order to service and maintain our drone defense network. At the moment there is no real expectation of ground or air drones conducting assault or final clearance operations against brave and prepared human soldiers.

**EFFECTS ON OTHER MILITARY ARMS
ARMOR**

- Main Battle Tanks have seen a massive reduction of use in Ukraine.
- Infantry Fighting Vehicles and Armored Transports are utilized more than ever.

Tanks are still useful, but their mission set has changed drastically. The essential properties of a tank, carrying a big gun and driving fast, are still useful. The armored protection of a tank is what drones are challenging in a big way. In the past, tanks have been employed to conduct face-to-face battles with enemy who are unable to stop them. This advantage is gone.

There are no tank-on-tank battles happening in Ukraine now. Russian tanks will still be wastefully employed on assault operations, in which a tank will never make it to its final fighting position before being defeated by Ukrainian drones. Ukrainians still do employ tanks either in a hit-and-run style ambush or as a large dug-in sniper. Either use case presumes the tank cannot protect itself from long exposure to the sky.

IFVs and armored transport continue to be absolutely vital on the Ukrainian battlefield. However, the areas where they operate have changed. They are vital to enabling logistics and transport of troops behind the line of contact. But seldomly are they used in the most forward areas of battle as they suffer the same survivability problem as tanks. When they are used in battle, they must move fast with minimum exposure.

ARTILLERY

- Drone corrected artillery is superior to human observers on radio.
- Battle hardened soldiers are not suppressed by artillery.
- Precision fire dominates.

Artillery maintains an advantage over drones in flight-time and response time. Artillery is primarily used to intercept enemy ground forces who are spotted too late to effect with a drone. This is still done sparingly because of the sheer effort it takes to dig in and conceal a large artillery piece. Once they have fired, they will have to spend time moving locations so as not to risk counter-battery or drone fires.

Artillery is also used effectively in counter-battery roles—to destroy enemy artillery or even enemy drone pilots when they are located. Steel-on-steel (principle of hitting targets directly with artillery) is the standard for artillery work in Ukraine. It is not enough to “suppress” targets. Rounds must impact and destroy their targets directly. Real-time video feed sent directly to artillery crews is vital to enabling this level of precision.

Both Russian and Ukrainian forces have taken a lot of artillery fire over these years, myself included. Nobody is afraid of artillery, it either hits you or it doesn't, and everyone on every combat rotation will come back with concussion injuries. That is simply the cost of fighting in Ukraine. Suppression missions where multiple artillery pieces fire at an area target to demoralize and prepare an objective for a follow on assault are both wasteful and ineffective. Unless they are actually impacting point targets of course.

INFANTRY

- All Ukrainian Infantry are 50% snipers—masters of concealment.
- Drones closely support infantry to enable massive kill ratios per man.
- Drone Pilots are increasingly embedded directly into infantry units.

Between all arms, Infantry have the best protection from enemy drones because they are small and hard to see. A typical assault formation will look like 8 well camouflaged soldiers split into four 2-man teams. They will move quietly and carefully with the support of friendly drones, bypassing mines and obstacles along their way. They will hold all fire and noise until they are as close to the enemy as possible, ideally among them if possible. Their final assault should last seconds to minutes and they must take the cover in the enemy positions immediately.

A difficult challenge indeed.

All along the way they will be supported by friendly drones, spotting threats ahead of and around them. Friendly interceptor drones will shield them from incoming strike drones. Electronic warfare specialists will be monitoring the fight in the spectrum, advising changes to video and control signals based on radio jamming and interference in the area of the operation.

In the distance, friendly artillery will suppress enemy artillery with counter-battery fire. In case the assault unit needs a distraction; a tank will be on standby ready to rush to the enemy position to fire two rounds and rush back to safety.

Back at the tactical operations center, up to 30 real-time video streams need to be monitored in order to coordinate all the recon, strike, interception and ground drone feeds that will support these 8 men as they cut through 50 to 100 Russians.

Combined arms operations are still as vital as ever in Ukraine, but many things have changed.

OLD VS NEW:

MISCONCEPTIONS ABOUT TECHNOLOGY AND MILITARY TACTICS IN UKRAINE.

SG T John “Jackie ” Roberts, G7, 3rd Army Corps, Armed Forces of Ukraine



TECHNOLOGY ALONE DOESN'T WIN WARS.

THE PEOPLE WHO KNOW HOW TO USE IT DO.

"Fara", commander of an air-defense UAV battery in the air-defense missile and artillery division of the "Rubizh" Brigade.

When people talk about modern war, they usually talk about technology. FPV interceptors, new communications systems, artificial intelligence, automation — all of it really is changing the battlefield. **But over my years of service I've become convinced of one thing: technology on its own doesn't win. The people who know how to use it win.**



A unit's effectiveness isn't determined by how much modern equipment it has. Above all, it's determined by its people. Our soldiers understand clearly that every target destroyed brings us closer to victory. We work against the enemy's high-value assets, and everyone here knows what their work is worth.

That's why motivation, discipline and training matter more to us than any set of technical specifications. A trained operator can get the most out of even a complex system. Without that training, even the best technology won't deliver what you expect from it.

There's another principle we can't be effective without today: constant analysis of our own work. At the end of every day we go through the sorties in detail — why a drone was lost, which decisions were right, which need to change. But the debrief itself isn't the important part. What matters is that by the next day those conclusions are already built into how we operate. In modern war, whoever learns faster wins.

We take the same approach to technology. We're constantly testing new solutions, but new doesn't always mean better. We don't replace proven systems just because something has come on the market. Every new piece of equipment has to prove itself in real combat conditions. If it genuinely gives us an advantage, we adopt it. If not, we keep working with what has already shown results.

One of Ukraine's greatest advantages, in my view, is the cooperation between the military and manufacturers. Many Ukrainian companies come to us after delivering their equipment and ask for honest feedback. Not as a formality, but because they want to make their products better. It's the military that works with these systems every day under combat conditions, and we're the ones who can see most clearly what needs improving.

Often this interaction is very simple. A pilot can contact the manufacturer directly from his position, describe a problem or propose a specific technical fix. If the recommendations really do improve the product, they go into production quickly.

That's what happened, for example, with a proposal to change the placement of the antennas on one system. It significantly improved video link quality, and the manufacturer carried the solution over into its next products. Other manufacturers later adopted the same approach. This is exactly how combat experience feeds directly into the development of Ukrainian technology.

The enemy is constantly improving too. Frequencies change, so do countermeasures and approaches to employing unmanned systems. This is a continuous technological race, and the advantage goes to whoever adapts faster. What works today may already have lost its effectiveness tomorrow. The ability to change quickly has become no less important than having modern equipment in the first place.

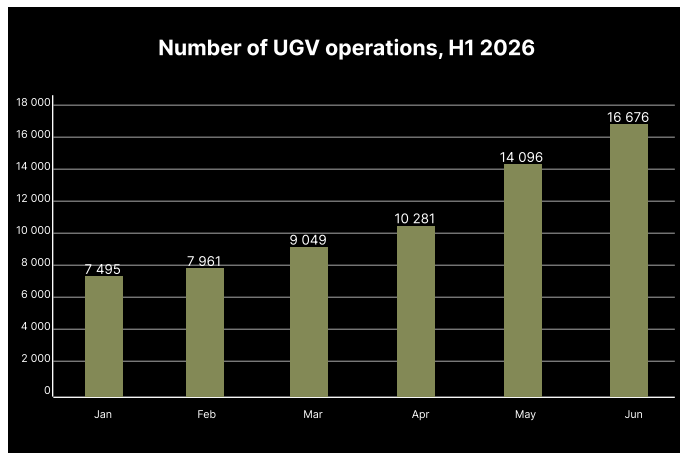
I'm convinced the next major step will be the development of artificial intelligence — above all, systems that help automatically detect targets, analyze the situation and support operators as they carry out combat tasks. Robotic ground systems and other autonomous platforms also hold great promise.

But no matter how fast technology develops, the core principle will stay the same. The best solutions are born when engineers work alongside soldiers, and combat experience turns within days into an improved product that goes straight back to the front. That kind of cooperation is one of Ukraine's strongest advantages today, and it will determine what the technologies of the future look like.



UKRAINE SCALES UP GROUND ROBOT OPERATIONS

In June, Ukrainian unmanned ground vehicles completed a record 16,676 battlefield missions, up from 7,495 in January—an increase of approximately 122% in five months. Monthly activity accelerated particularly quickly in spring, rising from 10,281 missions in April to 14,096 in May and 16,676 in June. Across the first half of 2026, **Ukrainian UGVs completed more than 66,000 missions.**



Monthly UGV operations during, H1 2026

The number of military units operating ground robots has expanded from 117 at the end of 2025 to 230 by mid-2026, while the Ministry of Defence has codified and authorized 67 new UGV models since January. For comparison, **Ukraine received approximately 2,000 systems in 2024 and 15,000 in 2025, while the current production objective is to reach 50,000 UGVs annually.**

The figures indicate that Ukrainian ground robotics is moving from isolated experimentation toward routine frontline infrastructure. The objective is eventually to transfer 100% of frontline logistics to unmanned systems, particularly missions that require movement across exposed terrain.

However, public statistics do not disclose mission success rates, platform losses, or how many robots are simultaneously operational. Scaling procurement will therefore need to be matched by operator training, maintenance, communications resilience, and a reliable replacement pipeline.

DRONE STRIKES NEAR ONE MILLION IN SIX MONTHS

According to Ukraine's Ministry of Defence, the number of verified enemy targets struck by Ukrainian drones increased significantly during the first half of 2026. Monthly strikes remained close to 105,000 in January and February before rising to 157,200 in March, 160,729 in April, 181,128 in May, and a record 200,218 in June.

Across January–June, Ukrainian drone units recorded 910,375 verified strikes. The million-target threshold was crossed in July, showing how unmanned systems have moved from a supporting capability to one of Ukraine's primary battlefield strike tools.

The growth also creates a major sustainment challenge. Maintaining this operational tempo requires continuous drone production, trained operators, resilient communications, sufficient munitions, and rapid adaptation to Russian electronic warfare and interceptor drones.



Verified Ukrainian Drone Strikes on Enemy Targets, H1 2026. Source: [MoD](#)



RUSSIA CONTINUES TO INCREASE ITS AERIAL TERROR

From January through June 2026, [Russia launched a total of approximately 1,093 missiles and 36,456 strike UAVs against Ukraine](#). In other words, drones overwhelmingly dominated the campaign by volume, while missiles remained a smaller but more concentrated instrument for hitting high-value targets.

The overall pattern suggests that Russia increasingly relies on mass and repetition: large UAV waves create constant pressure on air defenses, while missile strikes are used more selectively to increase lethality and complicate interception.

The clearest six-month trend is the expansion of the drone component. **Strike UAV launches rose from 4,442 in January to 8,161 in May, before dropping to 5,749 in June.**

Even with that decline in June, the broader trajectory shows that drones have become the main delivery system for sustaining pressure on Ukrainian cities and infrastructure. In practice, these UAV waves serve several purposes at once: they exhaust interceptor stocks, force Ukraine to disperse air-defense assets, reveal firing positions, and create openings for follow-on missile strikes.

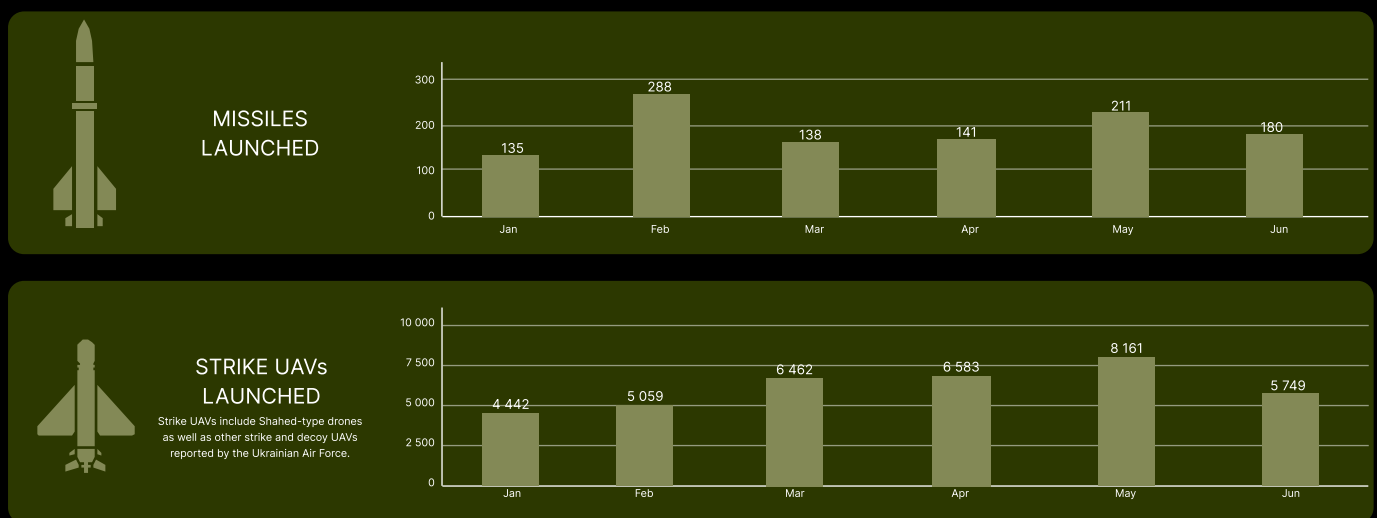
The missile trend has been more uneven but still significant. Monthly launches peaked at 288 in February, then remained elevated at 211 in May and 180 in June, for a cumulative 1,093 missiles in the first half of the year.

This suggests that Russia has not replaced missiles with drones, but rather is using the two together in a layered strike model: drones for scale and persistence, missiles for speed, precision, and harder-to-stop strikes against better-protected or time-sensitive targets.

A particularly important shift emerged in July, when Russia reduced UAV use but sharply [increased reliance on ballistic weapons](#). During the first 19 days of the month, it reportedly launched 107 ballistic missiles, including 41 in a single July 19 attack—more ballistic missiles than Russia was estimated to manufacture during the same period.

The shift likely reflects ballistic missiles' higher probability of penetrating Ukrainian defenses: unlike most drones and cruise missiles, they can generally be intercepted only by a limited number of advanced systems such as Patriot. Russia also increasingly extended attacks into daylight hours and used successive waves to maintain pressure beyond the traditional overnight strike window.

Launched missiles and strike UAVs by month, Jan–Jun 2026



Launched missiles and strike UAVs by month, Jan–Jun 2026

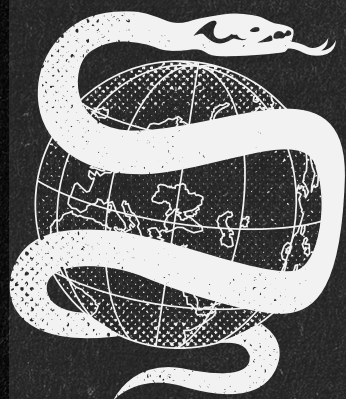
Source: [Air Forces](#)

SOURCES

- BAE Systems. "BAE Systems Signs Light Gun License Agreement with Strategic Defence Partner in Ukraine." BAE Systems, 2026. [Link](#)
- UNIAN. "Ukraine to Begin Producing British L119 Guns: Details." UNIAN, 2026. [Link](#)
- Ukrainska Pravda. "Ukraine to Produce British L119 Artillery Systems." Ukrainska Pravda, 2026. [Link](#)
- Ukrainska Pravda. "Ukrainian Soldiers from Lasar's Group Destroy 171 Russian Artillery Pieces over Two Nights." Ukrainska Pravda, 2026. [Link](#)
- Lasar's Group. "Art.Auchan: 231 Russian Artillery Systems Hit in Two Nights." Facebook, 2026. [Link](#)
- UNITED24 Media. "Ukraine's Secretive Auchan Drone Operation Hit 1,180 Russian Targets—Here's Why It Matters." UNITED24 Media, 2026. [Link](#)
- The Guardian. "Ukraine War Briefing: Zelenskyy Declares 40-Day Russia Blitz to 'Influence the Aggressor State.'" The Guardian, 2026. [Link](#)
- Security Service of Ukraine. "Results of the First Week of the SBU's 40-Day Operation." Telegram, 2026. [Link](#)
- Slovo i Dilo. "SBU Summarizes a Week of Long-Range Strikes against Strategic Russian Targets." Slovo i Dilo, 2026. [Link](#)
- Security Service of Ukraine. "Results of the Second Week of the SBU's 40-Day Operation." Telegram, 2026. [Link](#)
- Slovo i Dilo. "SBU Summarizes Another Week of Its 40-Day Operation against Strategic Russian Targets." Slovo i Dilo, 2026. [Link](#)
- Security Service of Ukraine. "Results of the Third Week of the SBU's 40-Day Operation." Telegram, 2026. [Link](#)
- Rheinmetall. "Oerlikon Skynex Networked Air Defence System." Rheinmetall, 2026. [Link](#)
- Federal Government of Germany. "Weapons and Military Equipment Delivered by Germany to Ukraine." Bundesregierung, 2026. [Link](#)
- Ukrinform. "Rheinmetall's Skynex Systems in Ukraine Intercept Not Only Shaheds but Also Cruise Missiles." Ukrinform, 2026. [Link](#)
- NV. "Ukraine Modernizes Soviet Strela Air-Defense System, Tripling Its Effectiveness." NV, 2026. [Link](#)
- Ministry of Defence of Ukraine. "New Ukrainian Precision Munition Firefly Ready for Series Production." Ministry of Defence of Ukraine, 2026. [Link](#)
- The Defender. "Firefly Guidance Modules for Ukrainian Bomber Drones." The Defender, 2026. [Link](#)
- Censor.NET. "New Ukrainian Firefly Munition Ready for Serial Production." Censor.NET, 2026. [Link](#)
- Reuters. "Ukrainian Drones Hit Russia's Largest Refinery in One of the Deepest Strikes Yet." Reuters, 2026. [Link](#)
- Militarnyi. "Updated FP-1 Strikes Omsk Oil Refinery More Than 2,500 Kilometers Away." Militarnyi, 2026. [Link](#)
- UNITED24 Media. "Ukraine Sets New Record for Longest One-Way Drone Strike." UNITED24 Media, 2026. [Link](#)
- UNITED24 Media. "Ukraine Carries Out World's First Sea Drone-to-Ground Robot Assault Mission." UNITED24 Media, 2026. [Link](#)
- 123rd Separate Territorial Defense Brigade. "Ukraine Conducts a Robotic Amphibious Assault on the Kinburn Spit." Telegram, 2026. [Link](#)
- Espresso. "Russia's Small Tanker Fleet Is Disappearing in the South, Says Lakiychuk." Espresso, 2026. [Link](#)
- Robert "Madyar" Brovdi. "MoLoCHKa: Fleet Stop—172 Vessels Hit in 13 Days." Facebook, 2026. [Link](#)
- Reuters. "Ukrainian Drone Strikes Choke Russian Shipping in the Sea of Azov." Reuters, 2026. [Link](#)
- Oko Hora. "Russian Vessel Activity in the Sea of Azov Falls during Operation MoLoCHKa." Telegram, 2026. [Link](#)
- Freedom. "Russia Lost More Than One Billion Dollars in a Week Due to Ukrainian Attacks on Shadow-Fleet Tankers." Freedom, 2026. [Link](#)
- The Wall Street Journal. "Ukraine's Battle-Tested Drone Boats to Be Made in the U.S. for the First Time." The Wall Street Journal, 2026. [Link](#)
- UNITED24 Media. "U.S. to Manufacture Ukraine's MAGURA Drones That Sank Russia's Black Sea Fleet." UNITED24 Media, 2026. [Link](#)
- RBC-Ukraine. "Ukraine Launches First FPV Drone Strike from Naval Drone Boats." RBC-Ukraine, 2026. [Link](#)
- 40th Separate Marine Brigade. "Combat Use of FPV Drones Launched from Barracuda Unmanned Boats." Facebook, 2026. [Link](#)
- UNITED24 Media. "Russia Hunted the Barracudas with Lancets—Ukrainian FPV Drones Rose from the Water." UNITED24 Media, 2026. [Link](#)
- 40th Separate Marine Brigade. "FPV Drones Launch from Barracuda Unmanned Surface Vessels." Facebook, 2026. [Link](#)
- NV. "Ukraine Launches First FPV Drone Strikes from Unmanned Barracuda Boats." NV, 2026. [Link](#)
- Bureau 1440. "Rassvet Low-Earth-Orbit Satellite Communications System." Bureau 1440, 2026. [Link](#)
- Serhii "Flash" Beskrestnov. "Russia Launches a New Batch of Rassvet Communications Satellites." Telegram, 2026. [Link](#)
- Militarnyi. "Russia Launches Second Batch of Satellites for Starlink Alternative." Militarnyi, 2026. [Link](#)
- Kyiv Post. "Russia Adds More Rassvet Satellites as Kremlin Builds Its Own 'Starlink.'" Kyiv Post, 2026. [Link](#)
- Ukrainska Pravda. "Russia Launches New Batch of Satellites Intended as Counterpart to Starlink." Ukrainska Pravda, 2026. [Link](#)
- UNITED24 Media. "Ukraine's Lima Quant EW System Gets Upgrade to Counter Most Advanced Russian Antennas." UNITED24 Media, 2026. [Link](#)

SOURCES

- Militarnyi. "Lima EW System Accounts for Half of Suppressed Aerial Targets, Says Night Watch Commander." Militarnyi, 2026. [Link](#)
- Militarnyi. "More Than 90% of Ukraine's Pokrova EW Network Consists of Lima Systems." Militarnyi, 2026. [Link](#)
- Security Service of Ukraine. "Since the Beginning of the Full-Scale War, the SBU Has Neutralized More Than 16,000 Russian Cyberattacks and Cyber Incidents." Security Service of Ukraine, 2026. [Link](#)
- The Record. "Ukrainian Media Outlets Now Among 'Priority Targets' for Russian Hackers." The Record, 2026. [Link](#)
- Ministry of Defence of Ukraine. "Ground Robotic Systems Completed More Than 16,600 Missions in One Month, Helping Protect Soldiers on the Front Line." Ministry of Defence of Ukraine, 2026. [Link](#)
- UNITED24 Media. "Ukraine's Ground Robots Complete More Than 66,000 Battlefield Missions." UNITED24 Media, 2026. [Link](#)
- Ministry of Defence of Ukraine. "Defence Forces of Ukraine Have Struck More Than 1 Million Enemy Targets with Drones Since the Beginning of the Year." Ministry of Defence of Ukraine, 2026. [Link](#)
- Air Force of the Armed Forces of Ukraine. "Official Telegram Channel of the Air Force of the Armed Forces of Ukraine." Telegram, 2026. [Link](#)
- Hromadske. "In July, Russia Launched More Ballistic Missiles at Ukraine Than It Produces in a Month, Media Reports." Hromadske, 2026. [Link](#)



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