

Drones, Robots and the New Cost of War: A Smaller Army's Answer to Russia

In July 2026, Ukraine's 123rd brigade [announced](#) that an uncrewed surface vessel crossed to the Russian-held Kinburn Spit in the Black Sea carrying a machine-gun-equipped ground robot. It reached the shore, released the robot and withdrew. The ground vehicle then moved forward to carry out its mission. No Ukrainian soldier crossed the water. A machine carried another machine into battle, the first such operation on record.

In autumn 2025, a severely wounded [Ukrainian soldier lay pinned](#) at his position for thirty-three days. Seven ground robots were sent to retrieve him. Six were destroyed by mines, drones, or small-arms fire. The seventh was damaged too, but completed the sixty-four-kilometer journey and brought the soldier back alive. The platforms were expendable. The person was not.

In March 2026, Ukraine's Unmanned Systems Forces [reported](#) that a fiber-optic FPV drone had downed a Russian Ka-52 attack helicopter near Pokrovsk. The unit valued the helicopter at about USD 16 million. A small, expendable aircraft had reached a platform designed to hunt tanks and infantry from a safe distance.

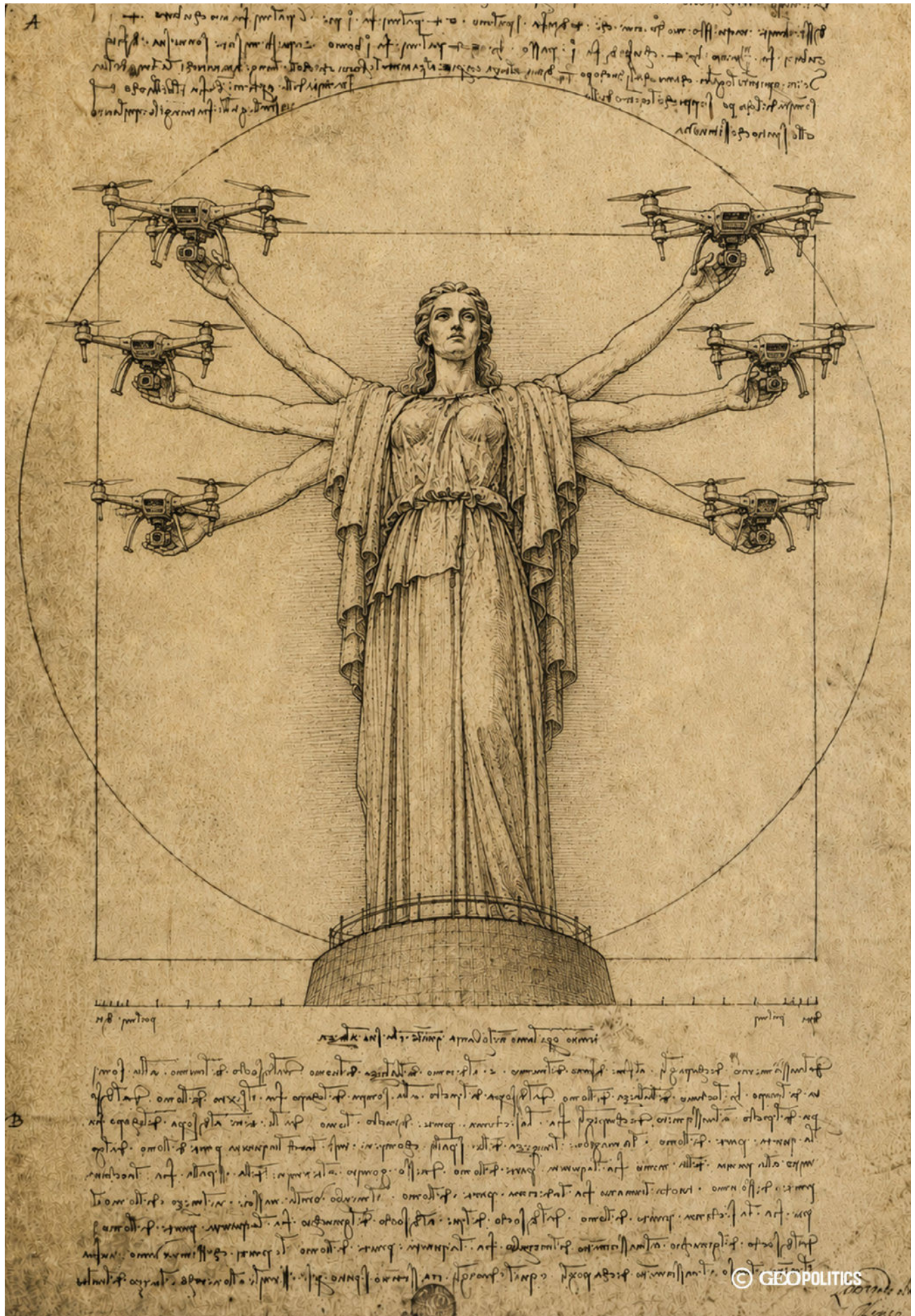
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These episodes capture the logic of Ukraine's emerging way of war. Ukraine is spending machines to save people it cannot replace and using that cost asymmetry to make Russia's larger force more expensive to move, protect and sustain.



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This illustration draws on Leonardo da Vinci's Vitruvian Man (c. 1490).

From the Frontline to the Workshop

Russia has the larger economy, more people, a deeper legacy defense-industrial base and greater capacity to absorb material losses. Ukraine's advantage lies in the unusually short loop between a frontline operator, an engineer, a workshop, a manufacturer and a procurement officer.

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Calling this a technology race misses the point. Neither side will win simply by possessing more drones or more advanced machines on paper. Russia is learning fast and copies successful Ukrainian solutions at scale. Ukraine's wager is that it can adapt faster than Russia can respond: change a frequency when electronic warfare renders it useless, alter a frame when it becomes too visible, redesign a payload after a mission fails, and move the revised system into production before the battlefield has changed again. In a war where each innovation triggers a countermeasure, speed of learning becomes a form of military power.

First-person-view (FPV) drones [became ubiquitous](#) in 2023, when artillery ammunition was scarce and conventional firepower could not cover every target. The months-long hold on American military assistance in 2024 reinforced the lesson. Ukraine could not base its survival exclusively on weapons that might arrive late, in insufficient quantities or with restrictions on their use. It needed a capability that could be assembled, adapted and replenished closer to the front.

Ukrainian FPV production [rose](#) from several thousand units in 2022 to projected five million in 2026. A cheap drone can destroy a vehicle, reach a trench, scout a route or force a unit to leave a position. Tasks that once demanded scarce artillery ammunition or

an aircraft sortie are now distributed among thousands of small crews.

Air defense [followed](#) the same logic. Russia's mass Shahed raids far exceeded Ukraine's supply of Western missiles, making a missile-for-drone exchange unsustainable. Ukrainian companies built cheap interceptors to thin the older propeller-driven swarms and preserve missiles for other threats. When Russia [introduced](#) jet-powered Shaheds, they responded with faster platforms and revised guidance, and are already reporting successful interceptions.

The systems still rely on [imported components](#), mainly Chinese, secure communications, trained operators, and protection from electronic warfare. They cannot replace artillery, air defense, or Western military support. Their importance lies in the options they create for a less resourceful smaller state. Building an FPV force does not require a fleet of combat aircraft or years of conventional procurement. It gives a smaller army a way to generate firepower at scale and to replenish it quickly.

The drone boom also changed the ground war behind the trenches. Persistent surveillance now covers roads, tree lines and supply routes that once lay beyond immediate danger. A pickup carrying ammunition, a medic crossing open ground or a group rotating into position can be detected and attacked within minutes. The final kilometers of a supply route [have become a combat zone](#).

[Ground robots](#) grew out of that problem. Armed platforms like the one used on Kinburn draw attention, but supply and casualty evacuation missions account for the overwhelming majority of Ukrainian UGV operations. In some of the most robotized formations, they [carry out](#) up to 90% of frontline supply runs. During the first half of 2026, Ukrainian forces [completed](#) more than 66,000 logistics and evacuation missions with ground robots.

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These machines are slow and remotely controlled. They get stuck in mud, lose contact, strike mines, and sometimes fail before reaching their destination. Commanders nevertheless keep sending them forward because the alternative is a driver, medic, or infantryman traveling through the same kill zone. Ukraine has shaped its systems around that calculation: cheap enough to risk, simple enough to repair, and useful enough to send out again. This changes the arithmetic of attrition.

The same logic, distributed and attritable, is now being extended beyond the front to the infrastructure that sustains Russia's war.

Long-range Sanctions: Making Russia Defend its Rear

In June 2025, [Operation Spiderweb](#) used 117 FPV drones against Russian strategic aviation. Ukraine said the attack damaged or destroyed forty-one aircraft. At up to USD 1,000 per drone, the entire force cost roughly USD 117,000, an extreme mismatch with the value of the bombers and surveillance aircraft it reached. Cheap, adaptable systems had exposed assets Russia assumed were safely beyond reach.

Ukraine lacks Russia's ballistic-missile arsenal, strategic aviation and naval power. It built a dispersed strike architecture around drones, cruise missiles and increasingly capable medium-range systems. Some now reach [more than 2,000 kilometers](#) into Russian territory.

Ukraine targets railway junctions, oil pumping stations, depots, ports, airfields, transport hubs, repair facilities and air-defense positions – places that allow Russia to sustain combat power. A damaged

refinery can be repaired. A delayed train can eventually move. But repeated disruption forces Russia to spread its air defenses, divert repair capacity and protect an ever larger number of vulnerable sites.

At the front, Ukraine sends a ground robot along a route that has become too dangerous for a driver. Hundreds of kilometers away, it sends a drone into airspace Russia assumed was secure. Russia must spend more to defend its territory than Ukraine spends to threaten it. Every air-defense system reassigned to an oil refinery, a bridge or a logistics hub leaves fewer systems available to protect troops closer to the front.

These attacks are colloquially dubbed "[long-range sanctions](#)." Russia has to hold a vast perimeter – energy infrastructure, major cities, transport arteries, military bases, the Black and Azov Seas, the approaches to the Caucasus – and the campaign works through rhythm and repetition rather than through any single strike.

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The Crimean Trap

Crimea concentrates this wider problem in one small territory. After 2014, Moscow turned the peninsula into a [heavily armed forward base](#). It deployed S-400 systems, expanded the airfields at Saky and Belbek, brought in submarines carrying cruise missiles and strengthened the ports at Sevastopol and Feodosiia.

When the full-scale invasion began, Crimea served as a launch pad for the advance towards Kherson and for missile and drone attacks on mainland Ukraine. The civilian economy became secondary.

That militarization created a dense concentration of targets. The underlying logic remains the same: expose a vulnerable link, strike it, and force Russia to spend more on protection than Ukraine spends on attack. Ukraine's operation MoLoCHKa ("Moscow will fall through Crimea"), launched on July 6, 2026, moved this method to sea. By July 30, Ukraine's Unmanned Systems Forces said they had struck [205 Russian tankers](#): 130 in the Sea of Azov and 75 in the Black Sea. The figure cannot be independently verified, yet the target choice is revealing. The campaign treats ordinary cargo traffic as a military vulnerability. Russian shipping does not stop, but it has to move more carefully, more slowly and under greater protection.

Ukrainian long-range drones have also targeted the M-14 route between Rostov-on-Don and Melitopol, one of the main arteries feeding the land corridor through occupied southern Ukraine. At the same time, the operation "[Crimean Switch-Off](#)" has struck substations and energy hubs. The aim is to degrade the power supply on which Russian logistics, bases and control systems in the occupied territories depend.

Crimea's logistics are concentrated enough for these layers to reinforce one another. Russia has several routes, the road and rail links through occupied southern Ukraine, the Kerch crossing and maritime traffic, but none is fully secure. Robert Brovdi, who commands Ukraine's Unmanned Systems Forces, has said that Ukrainian forces [are deliberately avoiding](#) the Kerch Bridge for now because it may be needed as an evacuation route. The target is Russia's ability to sustain combat on the peninsula.

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guarded tanker, fuel shortage, offline substation and air-defense redeployment shows that Russian control is conditional rather than permanent. This is what cognitive de-occupation looks like in material form: not the inconvenience itself, but the occupation made visible again – costly, vulnerable and unfinished.

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From Arms Recipient to Security Provider

By 2026, after four years negotiating each Western delivery, Kyiv began [exporting its own weapons](#). Ukrainian officers often say that a small Soviet army cannot defeat a large Soviet army.

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This matters for smaller countries with limited defense budgets, especially those bordering Russia – in the Baltic, the Black Sea, the Caucasus, and the Arctic. No state can buy enough expensive systems

to protect all of its critical infrastructure. Investing in domestic drone capacity – operators, components, electronic warfare, testing ranges, local repair and rapid procurement – offers a more realistic way to build mass and resilience.

Drones, however, will not replace alliances, air defense, or conventional forces.

Most armies of former Soviet Union countries inherited the same accounting. Equipment is capital:

registered, signed for, and investigated when lost. People are the renewable input. Ukraine reversed the entries. A ground robot can be sent along a mined or drone-covered route because the driver, medic, or infantryman it replaces cannot be reordered. An FPV may be lost against a vehicle, helicopter, radar or refinery because its modest cost can force Russia to spend far more to repair, replace or protect the target ■