



SNAKE ISLAND INSTITUTE

Defense Tech Monthly:

Ukraine-Russia Battlefield

Edition #1

June 2025



Section I: Frontline Update

Sumy direction:

- The enemy continues to apply pressure involving a large number of infantry, supported by UAS assets, artillery, and destructive means. The largest number of assault operations is concentrated in the Yunakivka-Yablunivka area.

Kharkiv direction:

- Activities observed ashore the right bank of the Oskil River. The enemy found a weak spot and demonstrated previous successes in the Holubivka-Redkivka area.

Donetsk direction:

- The enemy is focusing a major effort against the Toretsk area, where it has targeted Kostyantynivka. Large numbers of infantry and FPV drones involved, in particular, using high-skilled crews which destroy logistics and places of concentration of the Defense Forces of Ukraine. Also, the enemy exerts great pressure on the Pokrovsk sector, specifically, in the area of the administrative border of the Dnipropetrovsk region, attracting a significant number of resources: infantry and drones. The Defense Forces of Ukraine manage to restrain the enemy though.

Southern direction:

- No major changes observed within the past month.

*Changes on the frontline within the past month are reflected based on the analysis, provided by the **DeepState** team.*

June 2025 Edition marks the launch of **Defense Tech Monthly** — a new publication series by the Snake Island Institute (SII), featuring frontline defense tech news and insights drawn directly from the field. Each issue of Defense Tech Monthly covers battlefield updates, frontline innovation and tech gaps — all shaped by those working at the edge of today's war.

The Snake Island Institute is Ukraine-U.S. initiative dedicated to strengthening strategic cooperation in defense through:

- **Analytics:** Advancing understanding of modern warfare and doctrine
- **International partnerships:** Aligning Ukrainian, U.S., and international decision-makers
- **Defense Tech:** Enabling integration of critical technologies into combat operations

Staying in the Loop

○ LAND

UGV-based Operations Signal Growing Role of Robotic Complexes in the Battlefield Tactics

Highlight

Insight

In a first-of-its-kind mission, soldiers of the #NC13 **UGV platoon**, 2nd Assault Battalion, 3rd Assault Brigade, captured two Russian soldiers using an assault group composed of several kamikaze UGVs, according to a SII source. The operation, conducted on June 14th, resulted in the two soldiers **surrendering directly to the UGV** — marking the first documented case of such a surrender in modern warfare. This also makes it the **first full-scale successful unmanned assault** on an enemy position, enabling territory recapture without infantry engagement.

The operation began with an FPV drone, followed by a UGV striking the entrance of the dugout. As a second UGV moved in, two Russian soldiers emerged, holding a sign indicating they wished to surrender and continued showing it directly to the UGV. Just days earlier, friendly infantry had attempted to storm the same position but suffered losses.



June 14th UGV-based operation: fire damage conducted by a kamikaze UGV. Source: provided by Makar, Commander of the #NC13 UGV unit

A second assault was scheduled but the successful UGV-led operation made it unnecessary — the position was secured without casualties.

Until now, UGVs primarily served in **four supporting roles**:

- **logistics and evacuation**
- **engineering tasks such as mining and demining**
- **fire support through mobile turret platforms**
- **kamikaze systems.**

The described mission demonstrates a turning point—UGVs were no longer just support assets but led a successful assault, demonstrating their emergence as primary combat tools.



A message saying “We want to surrender”, demonstrated by the Russian military during the kamikaze UGV attack. Source: provided by Makar, Commander of the #NC13 UGV unit



POW capture enabled by the UGV-based operation. Source: provided by Makar, Commander of the #NC13 UGV unit

Another key role of UGVs on the battlefield, as highlighted by the military, is the **evacuation of wounded and KIA**, now conducted on a regular basis. In this context, UGVs are deployed in extreme cases: “when there is no chance for evacuation by “conventional” means such as transport and special vehicles — mostly, in the open unprotected areas,” — **explains Makar**, Commander of the #NC13 UGV platoon of the 2nd Assault Battalion, 3rd Assault Brigade.

His unit was created from scratch when the UGV concept was still emerging.

*“UGV-based evacuation is considered a **complex multi-component process** as it requires (apart from UGVs themselves) the involvement of EW means, aerial reconnaissance, communication between the wounded and the operator, the suppression by artillery means of enemy UAV takeoff points. The highest possible level of cover is required to conduct a single operation. It is all about solid planning, strong logistics, and operator skills — all factors put together,”*

Makar,
Commander of the #NC13 UGV unit.

In terms of UGV tech development, a few specs are critical. The new UGV models prescribed for evacuation (currently under development) are likely to demonstrate **higher speed** and **better maneuverability**, while the **increased armor protection** is yet a desired improvement, according to the respondent.

Ukrainian Training and Testing Complex - UTTC - Was Launched to Test and Accelerate Modern Demining Technologies

The UTTC features tracks and obstacle routes for light and heavy mechanized mine clearance systems, test sites for UAS and UGVs, metal detectors, demining tools, civil protection structures, and environmental monitoring devices. It is expected to serve as a hub for **mine action**, **civil protection**, and **environmental safety** – supporting scientific research and industrial capabilities by testing both domestic and foreign equipment.



The UTTC facilities. Source: [the MoD of Ukraine](#)

Remote MK19 Turrets Are Now Systematically Deployed in Assault Ops

June marked the first systematic use of remote MK19 grenade launchers to support infantry assaults, delivering suppressive fire from unmanned or covered positions — especially valuable in trench and fortified combat. While Ukraine’s MoD officially codified the ShaBlya MK19(M) this month, most fielded systems are other remote MK19 platforms, not ShaBlya specifically. This underscores a common pattern: MoD codification does not always reflect frontline adoption, which often relies on earlier or alternative variants already integrated and combat proven by the units.

LACK OF TECH

Blind Spot: Tech for Armored Vehicles Needed To Survive

While UGVs are taking roots into active tactical operations, traditional large and human-operated armored vehicles have become one of the most vulnerable spots, struggling to survive modern drone-infested battlefields. Crews rely on nets and wire mesh as active protection, while high-quality EW means, sensors and C-UAS systems are still largely missing from the battlefield.



Remotely operated ShaBlya MK19(M) weapon station. Source: [the MoD of Ukraine](#)

Operation Spiderweb: a Milestone in Ukraine's Asymmetric Warfare

The **Operation Spiderweb**, carried out on June 1st by the Security Service of Ukraine (SBU), involved over 100 drones that were hidden in trucks across Russian deep rear and deployed against five military airbases. Being a brilliant example of an **asymmetric warfare approach**, the SBU-led operation resulted in 41 strategic aircraft damaged, including Tu-95, Tu-22M3, and Tu-160 bombers, **rare A-50** Airborne Warning and Control System (AWACS), and An-12 and Il-78 transport aircraft. The total damage was estimated as \$7 billion, while it is more important to highlight that **the attack** has destroyed **approx. 34% of Russia's existing missile carriers**.

According to **the SBU**, the operation used a mix of autonomous AI algorithms and manual control. When signal was lost, some UAVs switched to pre-programmed AI routes and automatically activated their warheads upon reaching designated targets.

Generally, the meaning of the operation Spiderweb lies in the creation of the **window of advantage** — as a result of **capabilities convergence** in time and space in selected domains and environments, enabling strategic shifts for Defense Forces of Ukraine. Ultimately, Spiderweb was an operation with a delayed effect that would unfold over time.



Russian strategic aircraft under precise attack during operation Spiderweb. Source: the **Security Service of Ukraine**

Ukrainian Deep Strikes Target Russian Strategic Infrastructure and Military Objects

In June, Ukraine continued its long-range drone (OWA) campaign against Russian critical infrastructure and strategic military objects. Strikes targeted multiple high-value sites, including the **Savasleyka** and **Buturlinovka** military airbases, **artillery arsenal** of the Russian army in Bryansk, **Tambov Gunpowder Plant**, producing gunpowder and pyroxylin which is used in explosives, **Alabuga**, Tatarstan, where a Shahed-type drone production hub is located, **Kristall oil storage base**, a strategic aviation fuel storage facility in Engels, **Novokuibyshevsk Petrochemical Plant**, involved in the production of explosives for artillery shells, and a major Kometa module facility at **Cheboksary**, used in loitering munitions.



"Kristall", Russia's strategic aviation fuel storage facility in Engels after Ukraine's deep strike attack on June 6th. Source: **Kyiv Independent** (credits: Astra/Telegram)



Satellite image of the fire at the "Kristall" fuel storage facility in Engels after Ukraine's deep strike attack on June 6th. Source: [AviVector](#)

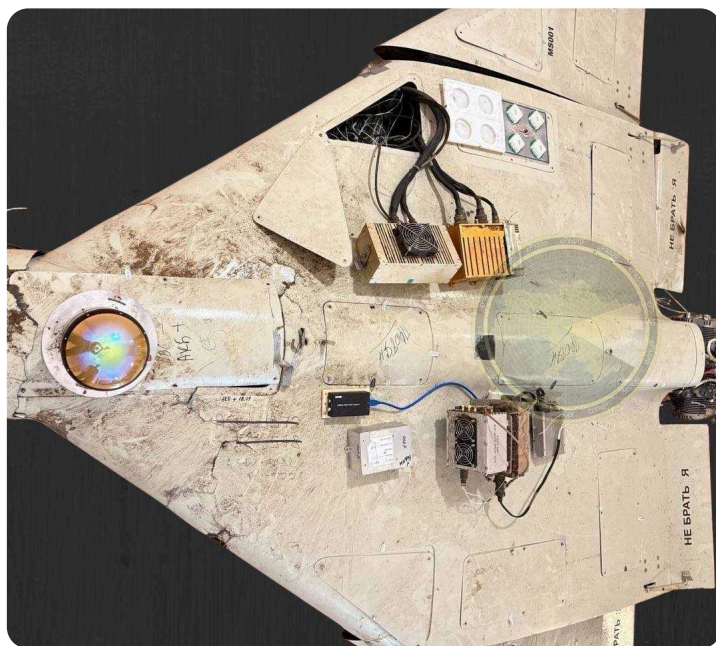
Notably, the June 14th attack against Nevinnomyssk Azot, a key supplier of components for explosives, ammo, and rocket fuel, one of Russia's largest chemical plants, **forced its shutdown** signaling a growing reliance on precision deep strike UAVs to disrupt logistics, defense production, and strategic assets deep within Russia's rear.

In turn, on June 27th the SOF Command confirmed that four **Russian SU-34 jets were destroyed** alongside the airfield's technical support section, used for maintenance and repair of combat aircraft, in a coordinated attack against Marinovka airfield, Volgograd region. Another precise attack took place on June 28th — the Security Service of Ukraine (SBU) reported that the drones struck the **Kirovske military airfield**, located in occupied Crimea. As such, Pantsir-S1 system and three helicopters — Mi-8, Mi-26, and Mi-28 — were destroyed. During the night, a secondary detonation of the ammo occurred.

New Shahed Variants Confirmed: Live Operator Control & Integrated Thermal Imaging System

In mid-June, Ukrainian forces recorded the first confirmed use of a Shahed attack drone equipped with a camera, Machine Vision module, and direct radio control system. Ukrainian EW/ES specialist **Serhii "Flash" Beskresnov explains** that unlike "traditional" Shahed UAVs, this modified variant **allows the operator to control the UAV** for a distance of up to 150 km away. The operational range may be increased in case the UAV is paired with a retransmitter within Ukrainian airspace.

Also, the use of a new Shahed drone, **equipped with a thermal imaging system**, was confirmed after the June 23rd massive drone attack against Kyiv. The **studied sample** is likely to be one of the first in the series, while its specific marking and distinctive four-component CRPA antenna of the Tallysman satellite navigation system indicate Iranian origin. It is worth noting that a Nvidia Jetson computer was integrated into the UAV's optical module, enabling **automatic targeting** by Machine Vision algorithms.



Wreckage of a Russian Shahed-136 variant, equipped with a thermal imaging camera, found after the June 23rd attack. Source: [Militarnyi](#) (credits: t.me/eRadarrua)

Drone Interceptors Gain Momentum in Tactical Air Defense

Insight

While several interceptor systems — especially those not domestically produced — have demonstrated success against Shahed-type drones when supported by trained crews and radars, Ukrainian-made platforms like the **Taras-P** are emerging as promising tools in the fight against Mavic, Molniya, Lancet, and Orlan-class drones.

Units like Darknode, 412 Regiment, Nemesis, as well as the units within the 3rd Assault Brigade have demonstrated that interceptor drones can play a vital role in layered air defense, serving as a scalable and relatively low-cost alternative to traditional systems. However, as explained by a SII source, the value of an interceptor drone today varies between \$5000 and \$8000 which can hardly classify it as a cheap weapon, rather indicating its **accessibility** in comparison to “conventional” means such as missiles.

Moreover, interceptor drones face technical limitations — most notably their lower speed compared to missiles. However, a key advantage is their flexibility: they require no dedicated launcher, unlike missiles. Overall, military assessments now increasingly view interceptor drones as an effective tool for both frontline air defense and countering Shahed-type attacks.



Taras-P interceptor drone samples. Source: Serhiy Prytula Foundation

Russia Deploys LTE-Controlled FPV Drones

Insight

In June, Russian forces reportedly tested and deployed FPV drones controlled over LTE/mobile internet. The drones were used on the Southern Donetsk axis to achieve unexpected attacks, operating with few vulnerabilities and marking a novel tactic in drone control. While the cases of the LTE-controlled drones were already covered previously, a SII source confirmed new cases which indicates that innovation may turn into a systematic use.

EYES WIDE SHUT

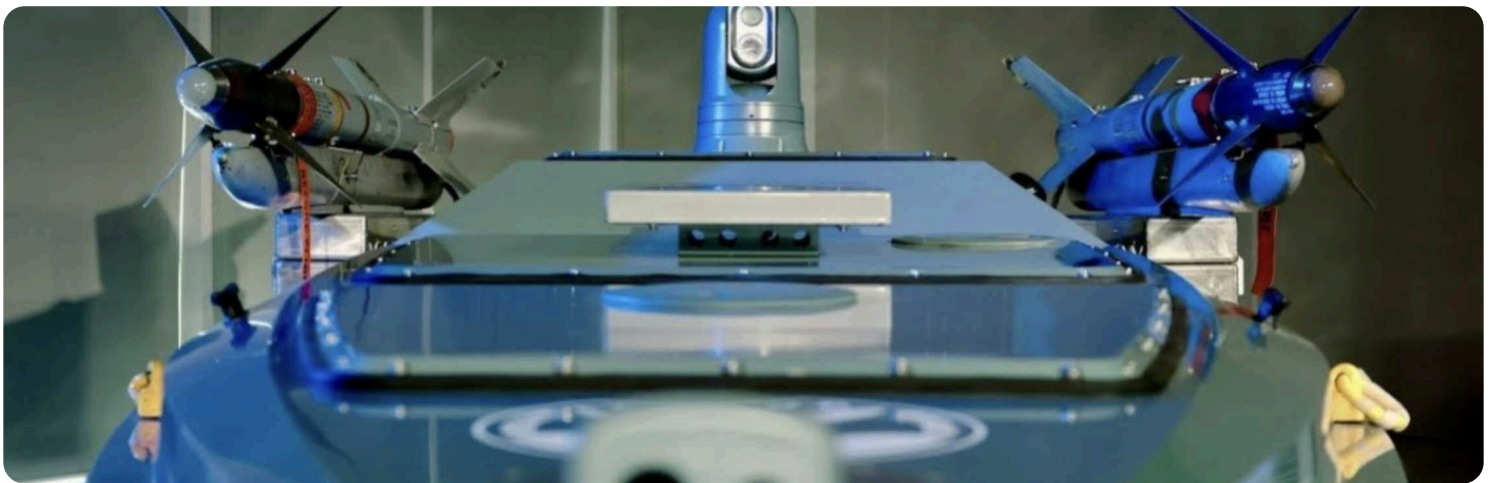
Blind Spot: Fiber-Optic Drones Rule The Skies

Jam-proof and signal-free, fiber-optic FPVs remain invisible to most detection systems. No tech solution to suggest a countermeasure has yet prevailed at the tactical level — most units still rely on visual spotting and shotguns.

AIM-9X Confirmed on Ukrainian USVs

Lt Gen Budanov confirmed that Ukraine has integrated AIM-9X missiles onto maritime drones, enabling these systems to challenge Russian aerial assets at sea. The use of AIM-9X — rather than older AIM-9L/M variants — provides advanced infrared targeting and off-boresight engagement capabilities, marking a significant upgrade in **Ukraine’s maritime strike** envelope.

The successful integration of USV-based operations as an element of maritime warfare should be seen as another example of Ukraine executing **asymmetric warfare** approaches.



Magura V7 equipped with two AIM-9 Sidewinder missiles which preceded AIM-9X, the latest version. Officially presented by the GUR MO in May 2025 as the USV which successfully shot down two Russian Su-30 fighters in early May. Source: the **GUR MO**

KONGSBERG to Cooperate with Ukraine on USV Development

The Norwegian government announced it **will provide funding** for the **mutual development and production of naval drones** in Ukraine. Kongsberg Defence & Aerospace will collaborate with Ukrainian partners, providing technology while manufacturing occurs in Ukraine. For 2025, Norway allocated approx. €576 million (NOK 6.7 billion) under the Norway-UK-led maritime coalition, which includes this USV project.

The initiative reflects a broader Norway-Ukraine defense tech partnership, strengthened by Kongsberg’s Kyiv office opening. Beyond maritime efforts, Norway will also **co-develop NASAMS** air defense missiles with Kongsberg and Ukraine.



The Sounder USV with gondola, produced by KONGSBERG. Source: **KONGSBERG**

NATO Invests in Satellite Communications For the Defense Forces of Ukraine

NATO has invested almost 37 million euros in **satellite communications** for the Defense Forces of Ukraine, as part of its Comprehensive Assistance Package. This allows strengthening combat management capabilities and enabling advancement to the information systems within the Defense Forces.

Namely, the military received special equipment, software, and technological support, including satellite radios, trackers, and services.

Ukrainian Cyber Corps Breaches Russian Bomber Bureau

According to the Defense Intelligence of the MoD of Ukraine (GUR MO), **Ukraine's cyber forces hacked** the Tupolev Design Bureau, stealing over 4.4 GB of sensitive data on Russia's long-range bombers Tu-22M and Tu-160, including personnel files, internal comms, and procurement records.

While not confirmed as part of Spiderweb, the operation, conducted just a few days after the operation Spiderweb, aligns with its doctrine of targeting strategic aviation assets.



R-500 Cruise Missile Upgraded with 16-Element Anti-Jam Antenna

For the first time, the R-500 cruise missile for the Iskander missile system was **equipped with a 16-element CRPA antenna**, even though it never relied much on satellite navigation. The finding was discovered after a combined missile strike against Kyiv, June 16. According to Defense Express, earlier variants used a 4-element Kometa-M antenna, with satellite guidance serving only as backup. The missile's primary navigation has remained based on inertial systems corrected by terrain contour matching (TERCOM).



A Kometa-M navigation unit with 16 elements found in a Shahed-type UAV. Source: **Defense Express**

Ukraine Deploys Domestic Radars to Support Drone Interceptors

Ukraine has started supplying its Armed Forces with **domestically produced tactical radar systems** specifically designed to detect and track enemy UAVs. These radars are now supporting interceptor drone units across several brigades. While Western-made systems typically offer longer detection ranges — over 10 km — they often come with complex settings and configurations.

By contrast, the Ukrainian systems are praised for their simplicity, stability, and operator-friendly design, making them more practical for fast-paced frontline use. This marks a step toward building a more **self-reliant, scalable C-UAS infrastructure**.

Low-tech Tools: Tactical Jamming Expands with Domestic Systems

Insight

June saw expanded deployment of **frontline jamming tools**. While fallback methods like shotguns remain in use against fiber-optic drones, integrated EW kits (e.g., Atlas network) are now enabling coordinated jamming at the tactical level. According to a SII insight, some brigades report that 100% of their currently fielded jamming systems are **domestically designed and produced**, reflecting Ukraine's accelerating **self-sufficiency in EW innovation**.

LACK OF TECH

Blind Spot: Net-Based Drone Defense Still At Forefront of C-UAS

Despite some advancement in the build-up of its own EW capabilities, Ukraine still lacks efficient EW means on tactical and operational warfare levels. Frontline units continue to deploy physical countermeasures including fishing nets and wire mesh to protect against FPV drone attacks.



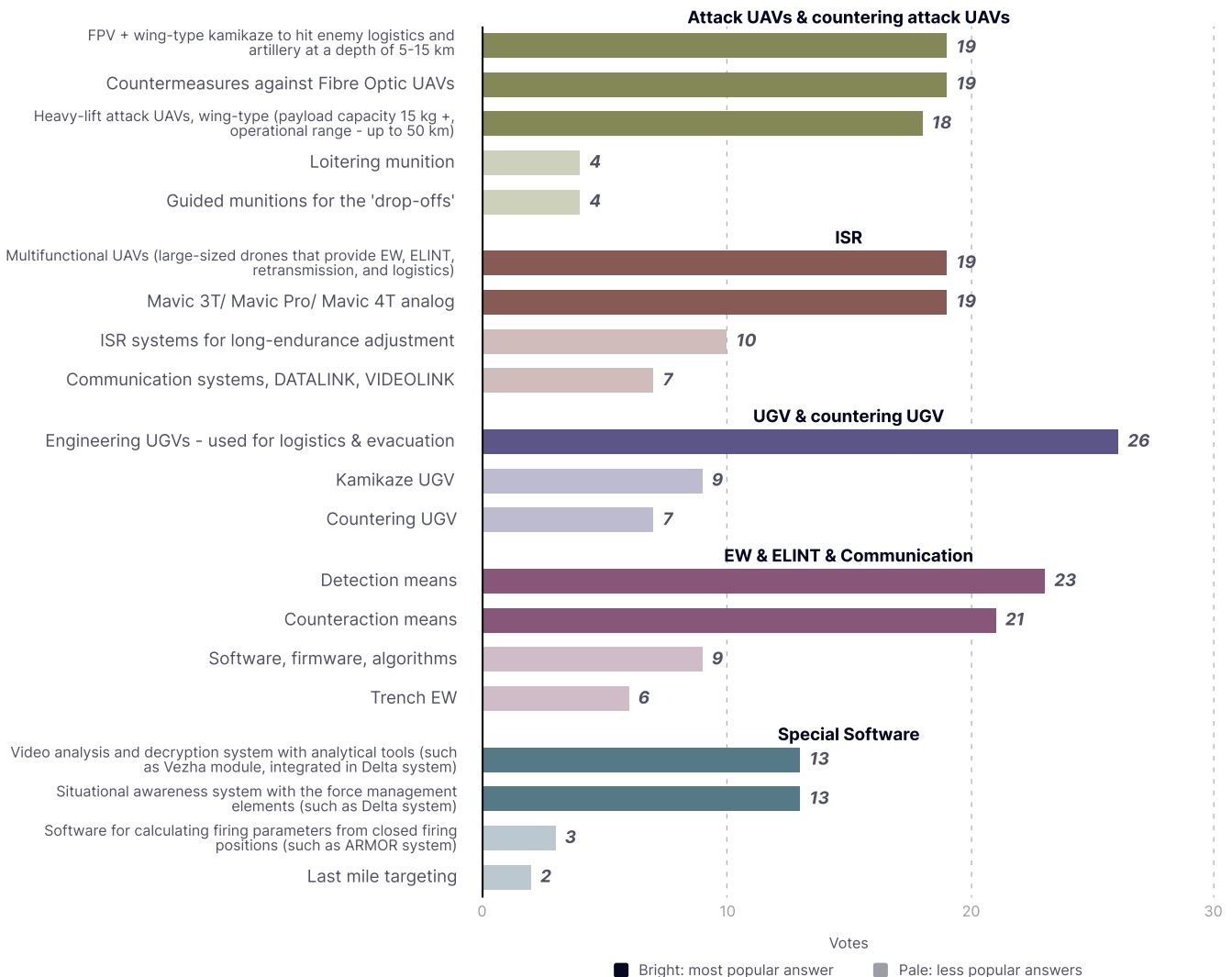
Identifying Battlefield Needs

With the launch of Ukraine Defense Tech Monthly, SII initiates a series of research activities, aimed at identifying the most relevant battlefield needs as of today. In this June Edition, SII presents a brief overview of the battlefield needs, based on the first in the series pre-assessment questionnaire results.

To define what technologies and innovations are mostly needed on the battlefield, the SII team created a survey, asking current military within the Defense Forces of Ukraine about their needs and opinions. The survey consists of 5 defense-tech categories, each suggesting multiple-choice across the options. Specifically, the 31 respondents that took part in the pre-assessment survey, were asked to choose all relevant options across the following categories:

- Attack UAVs & countering attack UAVs;
- ISR (Reconnaissance UAS);
- UGV & countering UGV (Unmanned Ground Vehicles);
- EW & ELINT & Communication (Electronic Warfare & Electronic Signals Intelligence & Communication means);
- Special Software (the so-called "combat software").

Battlefield Needs by Category

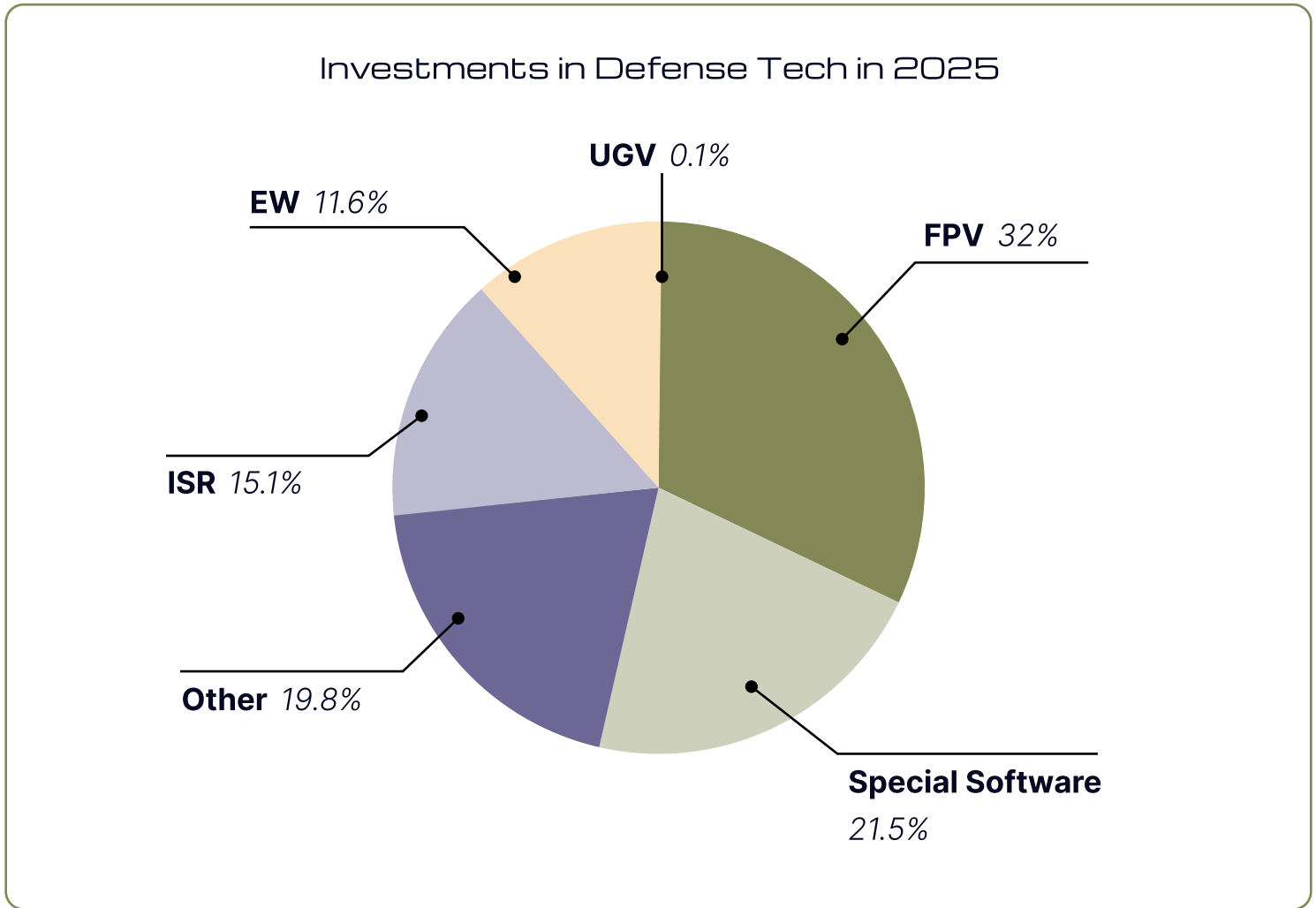




Identifying Battlefield Needs

The following graph shows publicly disclosed investments in defense technology during 2025, grouped by operational categories such as EW, FPV, ISR, Special Software, and UGV.

Each section reflects total funding volumes across specific subdomains, offering a snapshot of where global capital has been allocated within the broader defense tech landscape.



The data collected from the open sources: [Crunchbase](#), [Tech Crunch](#), [Axios](#), [Breaking Defense](#), [Sifted](#), [Defense One](#), [Defense News](#).

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