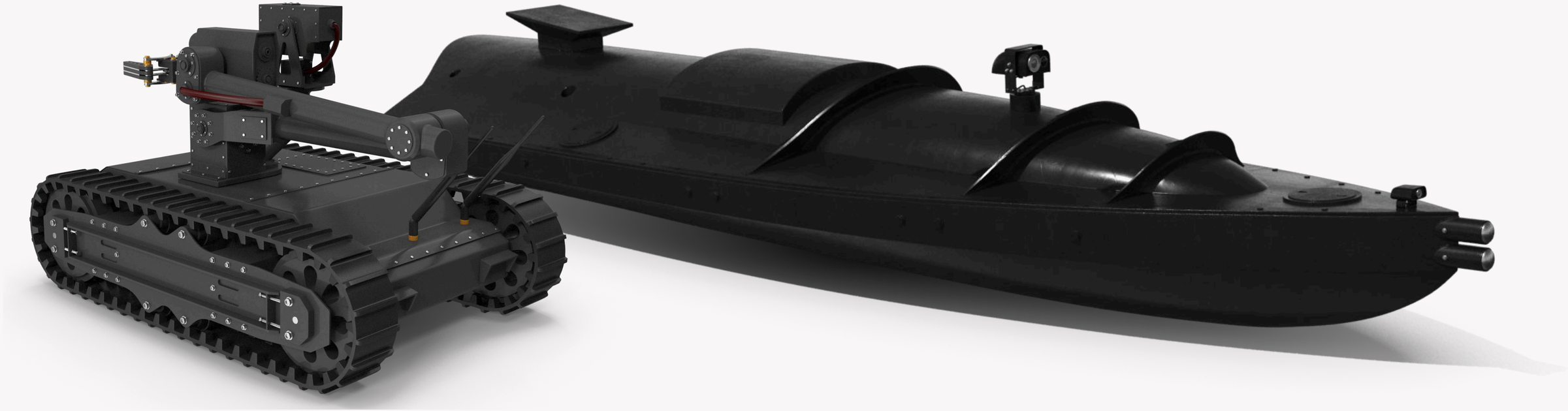
COLONEL
VADYM SUKHAREVSKYI

FRONTLINE TECHNOLOGY INNOVATION: RAPID ITERATION UNDER FIRE

UAF UNMANNED SYSTEMS FORCES

The Unmanned Systems Forces (USF) are the world’s first separate branch of service, created to integrate unmanned and robotic systems across all levels of the Armed Forces of Ukraine.

USF’s mission is to standardize, scale, and accelerate the use of drones and ground robots in the air, on land, at sea, and in the information domain — turning technologies into real combat capabilities.



WHY THE USF WERE CREATED

Drones have radically changed tactics, logistics, and the cost structure of war. To defeat a stronger adversary, Ukraine needs innovation speed, unified doctrines, operator training, and direct interaction with engineers and manufacturers.

THE USF CONSOLIDATE FRAGMENTED INITIATIVES INTO A SYSTEM CAPABLE OF SCALING SUCCESS.

MULTI-DOMAIN APPROACH

AIR

24/7 reconnaissance, fire adjustment, FPV strikes, and long-range UAVs.

LAND

Robotic platforms for resupply, engineering tasks, and medevac.

SEA

surface drones for asymmetric actions against fleet and infrastructure.

INFO/EW

communication protection, autonomous modes, sensor networks, and real-time data sharing.

HOW WE FIGHT WITH DRONES

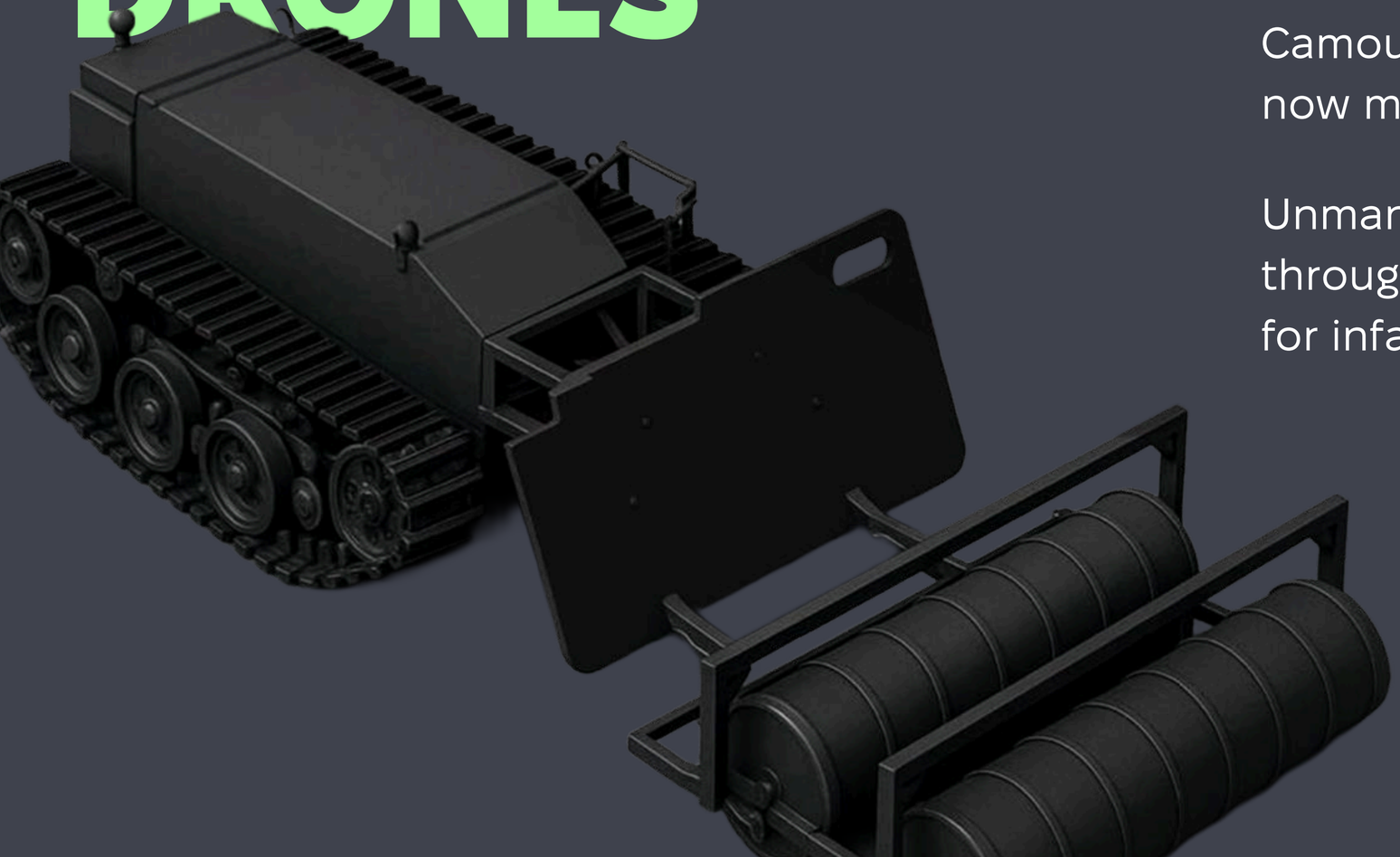
FPV kamikaze drones strike armored vehicles, fortifications, and logistics hubs en masse.

Drone swarms stretch enemy air defenses and provide a "long arm" reaching hundreds of kilometers deep.

The key: inexpensive but numerous platforms and munitions, rapidly adapted to mission and terrain.

- Middle strike: destroying logistics.
- Deep strike: crippling the enemy economy.

HOW WE DEFEND WITH DRONES



Continuous aerial reconnaissance makes the frontline "transparent": we detect maneuvers earlier, prepare fires, and disrupt assaults.

Against enemy FPVs — mobile anti-drone groups with jammers and interceptors.

Camouflage, decoys, and radio discipline are now mandatory defense elements.

Unmanned demining drones clear paths through minefields and enable safer maneuver for infantry and vehicles.

HOW WE DELIVER WITH DRONES

Logistics and Medevac in the 20–50 km “Kill Zones” — where crewed vehicles face unacceptable risks, drones step in:

- Air drones deliver urgent cargo (blood, medicine, spare parts).
- Ground robots resupply ammo and evacuate the wounded under fire.
  This reduces losses, speeds up supply cycles, and boosts resilience in hard-to-reach sectors.

ARCHITECTURE OF RAPID INNOVATION

We merged combat units, engineers, and manufacturers into a single cycle:

T → SCALE → OBSERVE → MODIFY → TEST → SCALE → OBSERVE → M

Solutions are field-tested in days/weeks, with feedback flowing directly from operator to designer.

The core principle: a short path from idea to unit.

EMBEDDED ENGINEERS AND FIELD MODIFICATIONS

OPERATOR = FIGHTER + TECHNICIAN

reflashing, antenna/servo swaps, battery selection, 3D-printing mounts, custom software tweaks.

Manufacturers visit units, observe real conditions, adjust design and software on-site, and ship updates in batches.

Meanwhile, units are equipped with mobile workshops and local R&D hubs.

WHAT WORKED

Logistics and medevac by drones/ robots in high-risk areas.

Fast training and dissemination of best practices between units.

Autonomous / EW-resistant modes, backup comms channels, fiber-optic tethers.

Mass, low-cost destruction of high-value targets (tanks, air defenses, depots).

WHAT DIDN’T WORK

Some imported drones built for “low EW” environments proved unreliable.

Large, slow platforms are too vulnerable under dense air defenses — their niche is limited.

Dependence on foreign ecosystems/ telemetry creates risks for operators.

Conclusion:

prioritize domestic development, EW resilience, and configuration flexibility.

KEY TAKEAWAYS FOR THE U.S. AND ALLIES

Doctrine must account for the “cascade of drones” and mass systems’ role.

Balance of quality × quantity × cost favors attritable swarms. (Attritable systems are those designed to be expendable.)

Decentralized unit-level budgets for experiments and rapid scaling.

Main weapon = innovation tempo: flexible procurement, rapid pilots, OTA/CSO.

DUAL-USE AND CIVILIAN TRANSFORMATION

WHAT WORKS UNDER FIRE ALSO WORKS IN PEACE:

drones for medicine and rescue

agriculture and ecology

monitoring of critical infrastructure

public safety and emergency response

IN UKRAINE WE PROVED: INNOVATION UNDER PRESSURE CAN SHIFT THE BALANCE OF POWER.

NOW IT'S THE ALLIES' TASK TO SCALE THESE LESSONS FOR COLLECTIVE SECURITY.

COLONEL
VADYM SUKHAREVSKYI

TANKS A LOT!