COUNTER HELICOPTER AUTONOMOUS SYSTEM

TEAM 8 (SIGMA SOFTWARE)

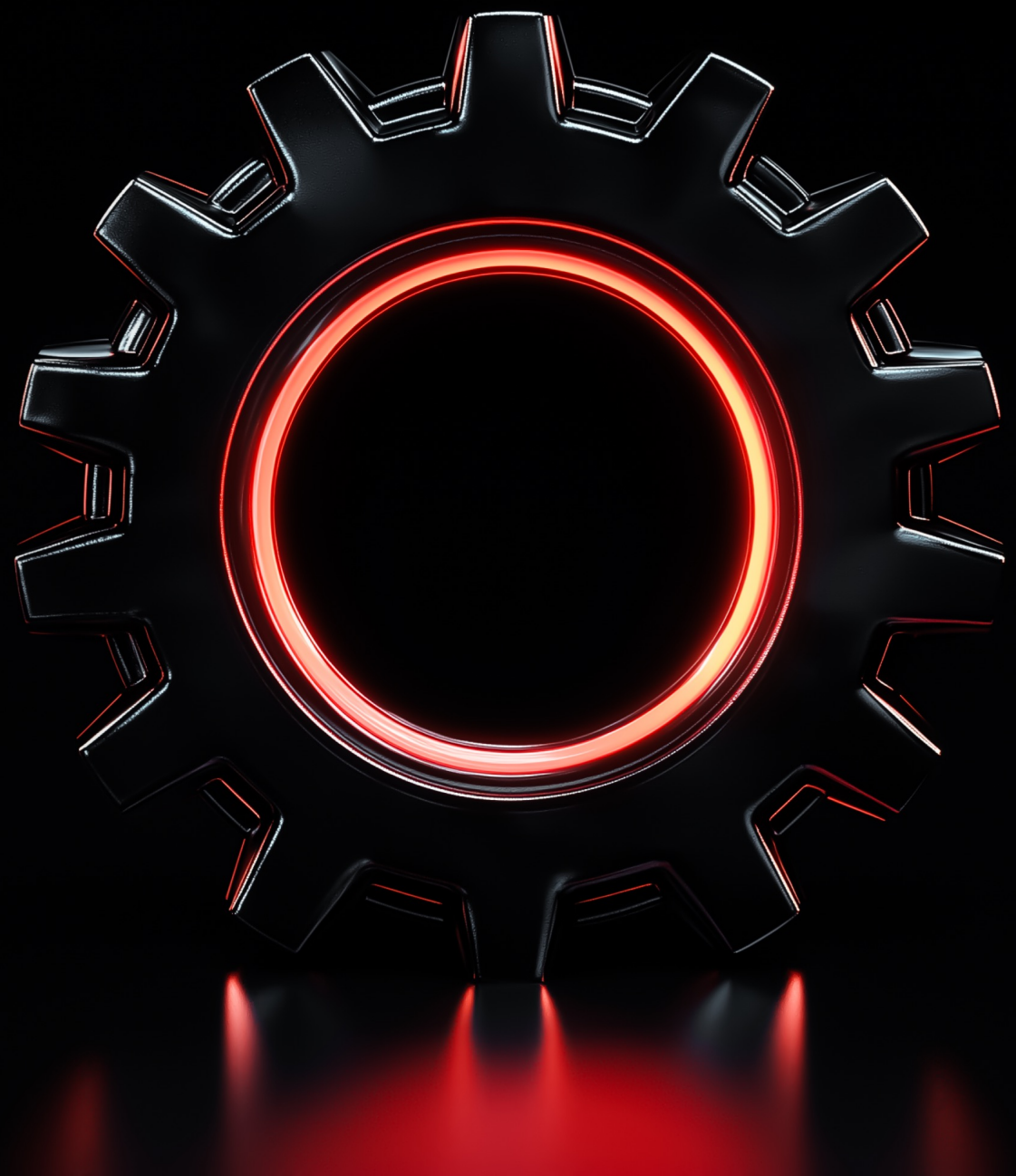
PANNOCHKA/MAIDEN

“And suddenly her eyes shone with an extraordinary power, harboring an inexplicable, sinister mystery...”

Mykola Gogol

PROBLEM STATEMENT

- Helicopter’s mobility, low-altitude flight capability, and use of terrain for cover make them challenging to detect and neutralize with traditional systems.
- Traditional radar struggles with terrain masking (effectiveness drops by up to 60%)
- Modern military helicopters are essential for enemy military operations, costing up to $30 million each, with the high operational capabilities, which makes them high-priority targets.



SOLUTION OVERVIEW

A cost-effective scalable autonomous active air defence system, powered by AI, designed to effectively counter helicopters. Engineered for deployment in battlefield frontline. Consists of Autonomous Stationery Unit with Attack Drones and custom Software Solution for the whole system.

KEY BENEFITS:

- Fully autonomous system
- Machine Learning-Based Accuracy
- Low production and maintenance expenses
- Simple to manufacture and scalable for mass production

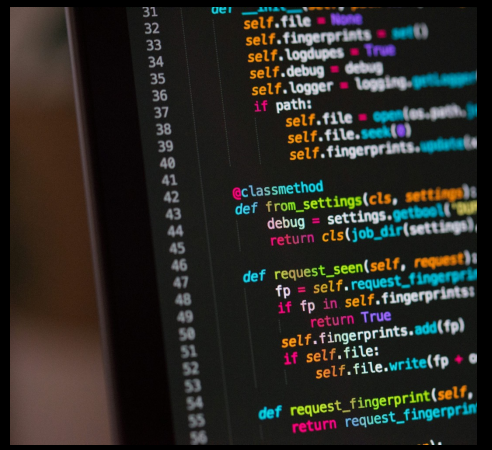
SYSTEM COMPONENTS

AUTONOMOUS STATIONERY UNIT (THE BOX)

- Dimensions: 60 x 140 cm
- Designed to hold two drones
- Equipped with 5 high-sensitivity acoustic sensors
- Battery-powered, providing 5–7 days of operation
- Fully water resistant
- Automatic Opening Mechanism for drones' release
- Box custom Software System
- Anti-Tampering Protection
- Weight: 5 kg

ATTACK DRONE (2 pcs/unit)

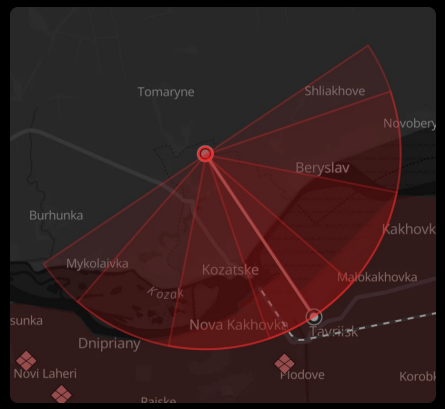
- FPV Drone
- Two Acoustic Sensors
- Thermal Camera
- Raspberry Pi
- Drone custom Software System
- Munition



CUSTOM SOFTWARE SYSTEM

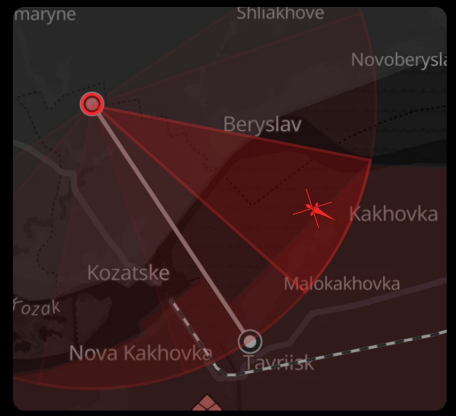
- Rust-based Solution
- Fully Autonomous
- Jamming-Resistant
- Smart Target Detection
- ML-based Target Detection
- Multi-Sensor Data Processing
- Predefined Destruction Algorithms

HOW IT WORKS



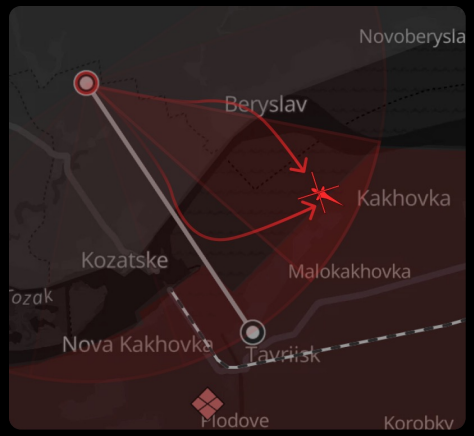
01 PASSIVE MODE

- A stationery unit is deployed on the frontline, partially buried on the ground with effective range of up to 10 km.
- Acoustic detection with ML-powered algorithms in standby mode



02 ACTIVATION

- Initial acoustic detection identifies a potential target.
- Up to 30 seconds for acoustic confirmation of the approaching target.



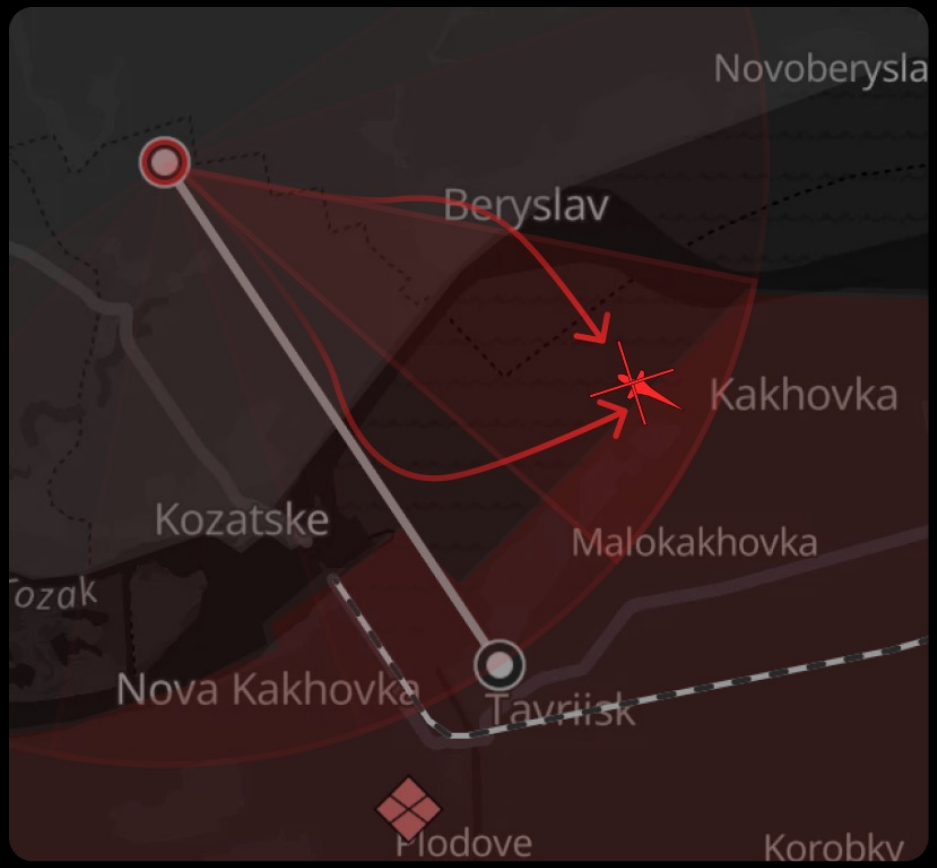
03 INTERCEPTION

- Attack drones are launched automatically to intercept the confirmed target.

04 TARGET ACQUISITION AND ELIMINATION

- The attack drone begins pursuit using its built-in acoustic sensor and later - thermal sensors for precise tracking.
- Target elimination is executed based on two sources.

POSSIBLE SCENARIOS



- Helicopters typically fly along predefined routes—valleys, ravines. The lower they fly, the better, to avoid radar detection. Our solution can cover the most likely helicopter attack routes.
- Operating at the frontline edge to shield trenches from helicopters in gray zones, counterattacking assault helicopters, or preventing troop landings.
- Securing coastal lines.

CURRENT STATUS

DONE

- Product Vision
- High-level architecture

IN PROGRESS

- Helicopter ML-powered acoustic detection (Box custom software system)

TO DO

- Box custom software system development
- Drone custom software system development
- Box and Drone prototype assemble
- Proving ground testing

ECONOMY

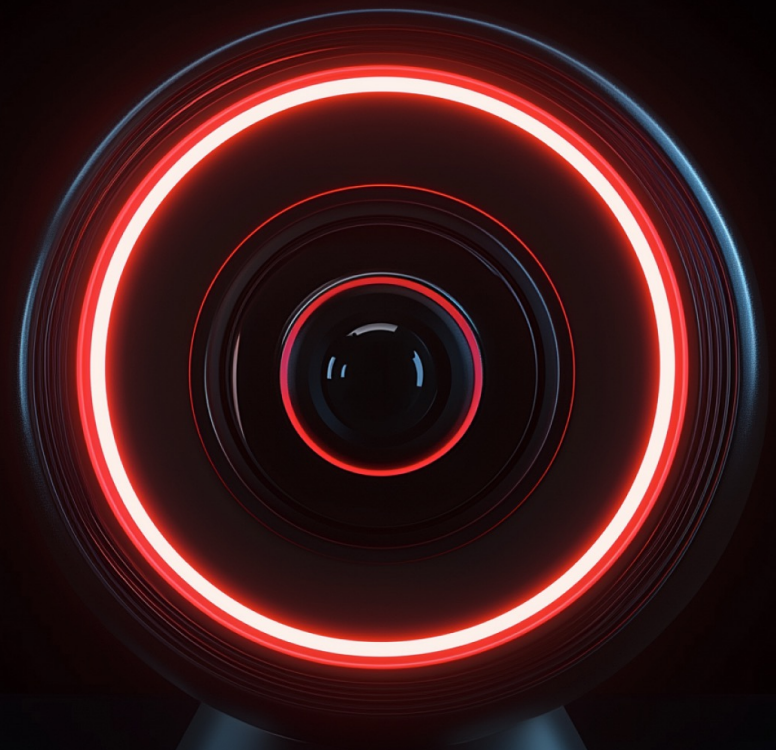
PRELIMINARY PRODUCTION COSTS

- Autonomous Stationery Unit (box) cost is 9 000 EUR.
- Drone cost is 2 450 EUR (2 per unit = 4 900 EUR/Box)

Subtotal = 13 900 EUR

SOFTWARE DEVELOPMENT

- Preliminary estimated duration: 8 months
- Team composition: 5 engineers



- Cost-Effective: Built from affordable, accessible components.
- Scalable: Simple assembly enables rapid production.
- Low Maintenance: Minimal upkeep for long-term use.
- Efficient Logistics: Low transportation and installation costs.

FURTHER DEVELOMENT

01 **LOW-ALTITUDE TACTICAL THREATS INTERCEPTION**

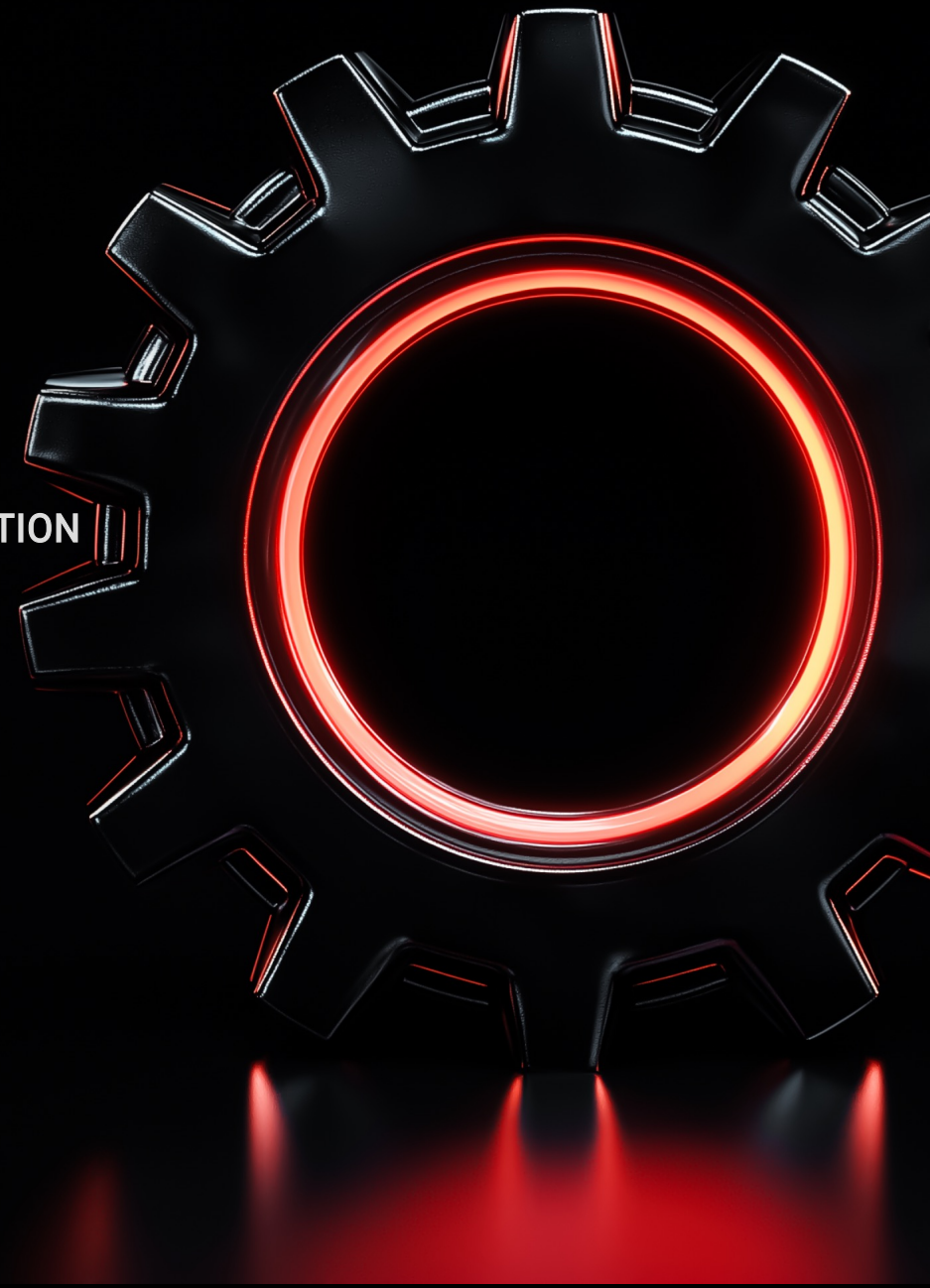
E.G. Shaheds

02 **CIVIL POPULATED AREAS/CRITICAL INFRASTRUCTURE PROTECTION**

Cities or small perimeters protected

03 **MOBILITY**

Launch, and operation in land and maritime domains + harsh weather conditions



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We're a part of **Sigma Software**, a global Swedish-Ukrainian IT company.

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of engineering experience

Established cooperation with frontline experts

45+
Implemented projects in different domains