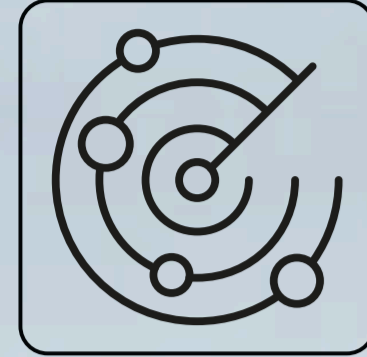
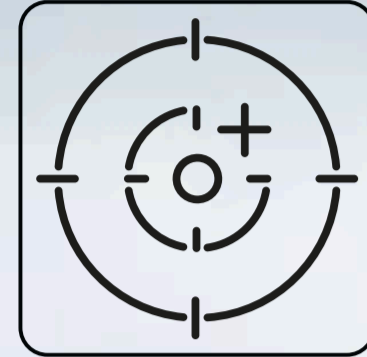


KEY ADVANTAGES

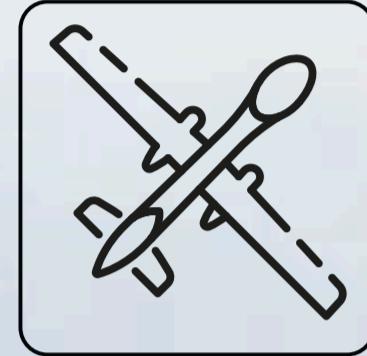
Interception Control System



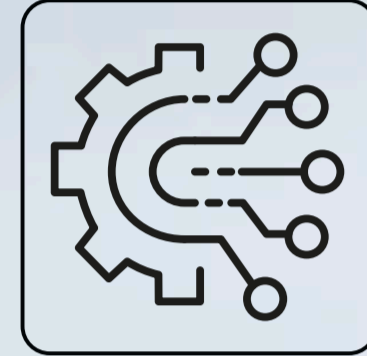
Higher probability of successful interception: increases the percentage of aerial targets successfully neutralized.



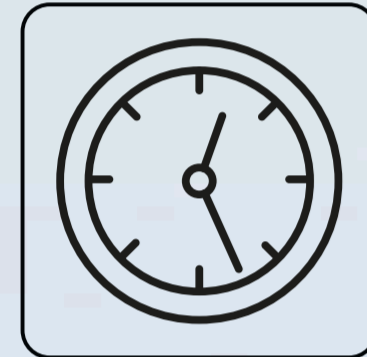
Time and resource savings: reduces flight time to target by 2.5–3x, and the drone arrives at the target with a higher battery charge level.



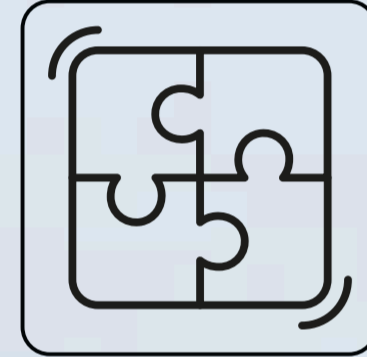
Ease of use: system deployment takes less than 5 minutes, and operator training time is significantly reduced.



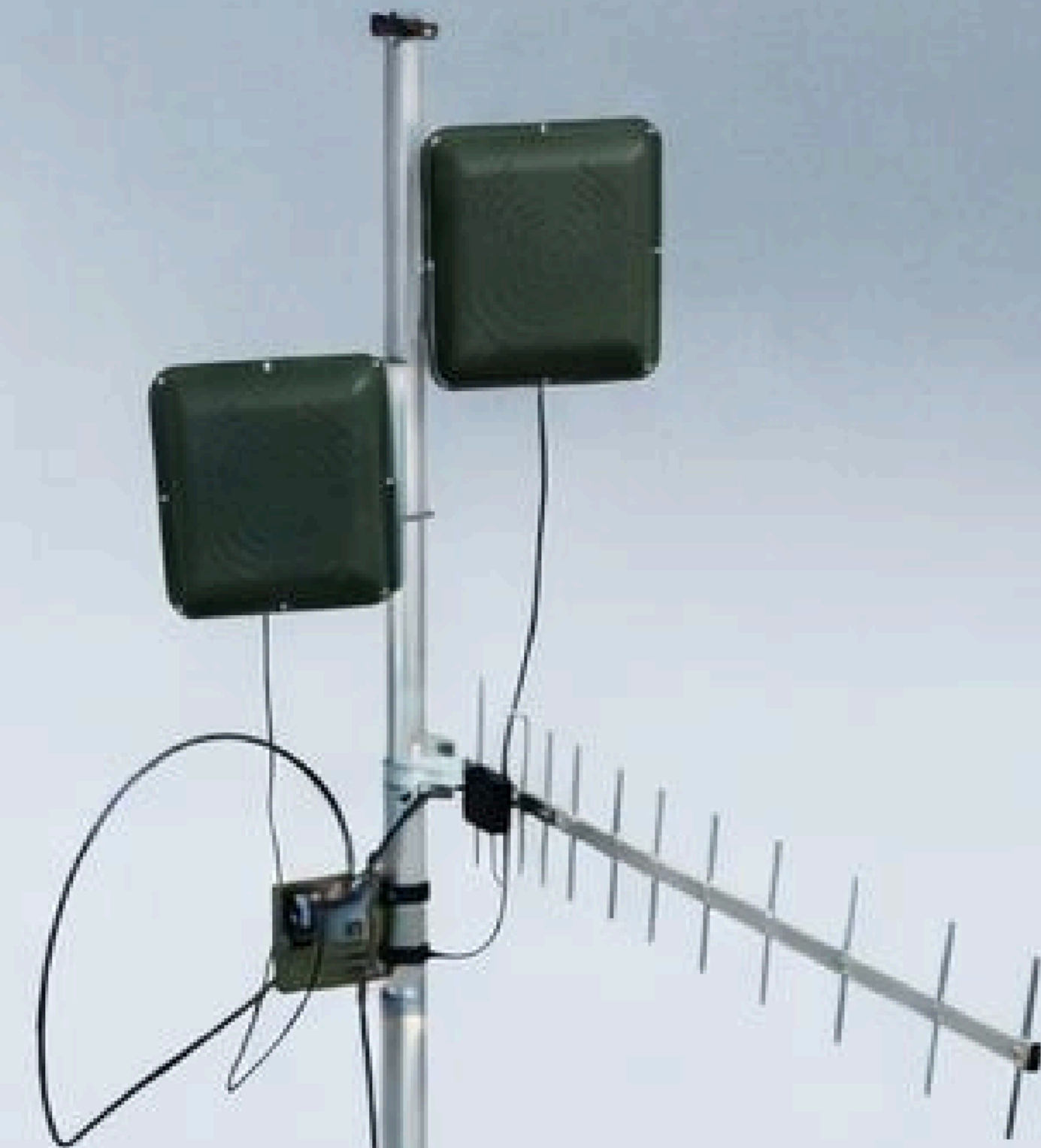
Minimal personnel workload: automation handles the main tasks.



High reliability: operates even when GPS is jammed, provides up to 2 hours of autonomous operation, supports interception from any direction (360°), and can return the drone to base even in the event of video link loss.



High flexibility: integrates with existing airspace monitoring systems, compatible with various radar types, and can work with interceptor drones from different manufacturers.



UAV COUNTERMEASURE SYSTEM

Enlock

Autonomous Interception of Hostile UAVs

Hardware and software complex for automated guidance of interceptor drones onto reconnaissance and strike UAVs. Operates day and night, in electronic warfare conditions and without GPS signal.



www.enlock.tech

CHALLENGES

Drawbacks of Manual UAV Countermeasures

Modern strike unmanned aerial vehicles pose a serious threat to critically important military and civilian facilities — airports, power stations, grid substations, and industrial enterprises. Traditional countermeasure methods require the operator to continuously control the interceptor drone manually, which leads to:

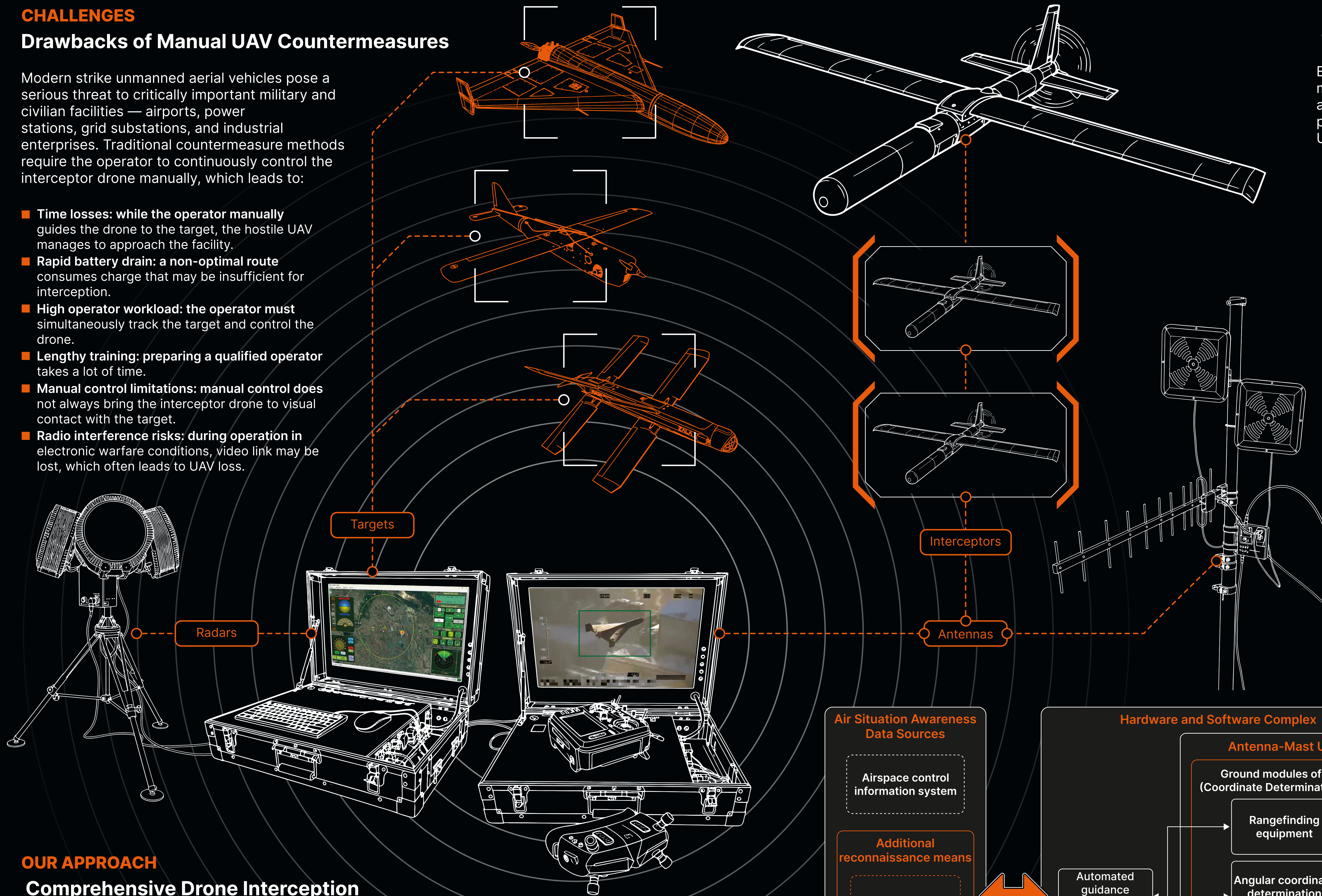
- **Time losses:** while the operator manually guides the drone to the target, the hostile UAV manages to approach the facility.
- **Rapid battery drain:** a non-optimal route consumes charge that may be insufficient for interception.
- **High operator workload:** the operator must simultaneously track the target and control the drone.
- **Lengthy training:** preparing a qualified operator takes a lot of time.
- **Manual control limitations:** manual control does not always bring the interceptor drone to visual contact with the target.
- **Radio interference risks:** during operation in electronic warfare conditions, video link may be lost, which often leads to UAV loss.

HOW IT WORKS

The Interception Process

Enlock System is a transition from manual control to intelligent automation, enabling more effective protection of critical facilities from UAV threats.

- **Threat detection**
The system receives data about the enemy drone from radars, surveillance systems, or airspace control networks.
- **Automatic calculation**
The software instantly analyzes the position and trajectory of the target, the position of our interceptor, and calculates the optimal interception course.
- **Intercept launch**
The operator sees the situation on screen and makes the launch decision.
- **Automatic guidance**
The drone flies along the optimal trajectory to the interception point, while the operator monitors the process on the map without manual control.
- **Visual contact**
The system brings the drone into the zone where the operator establishes visual contact via the onboard camera. If needed, the operator switches to manual control for the final interception.



OUR APPROACH

Comprehensive Drone Interception

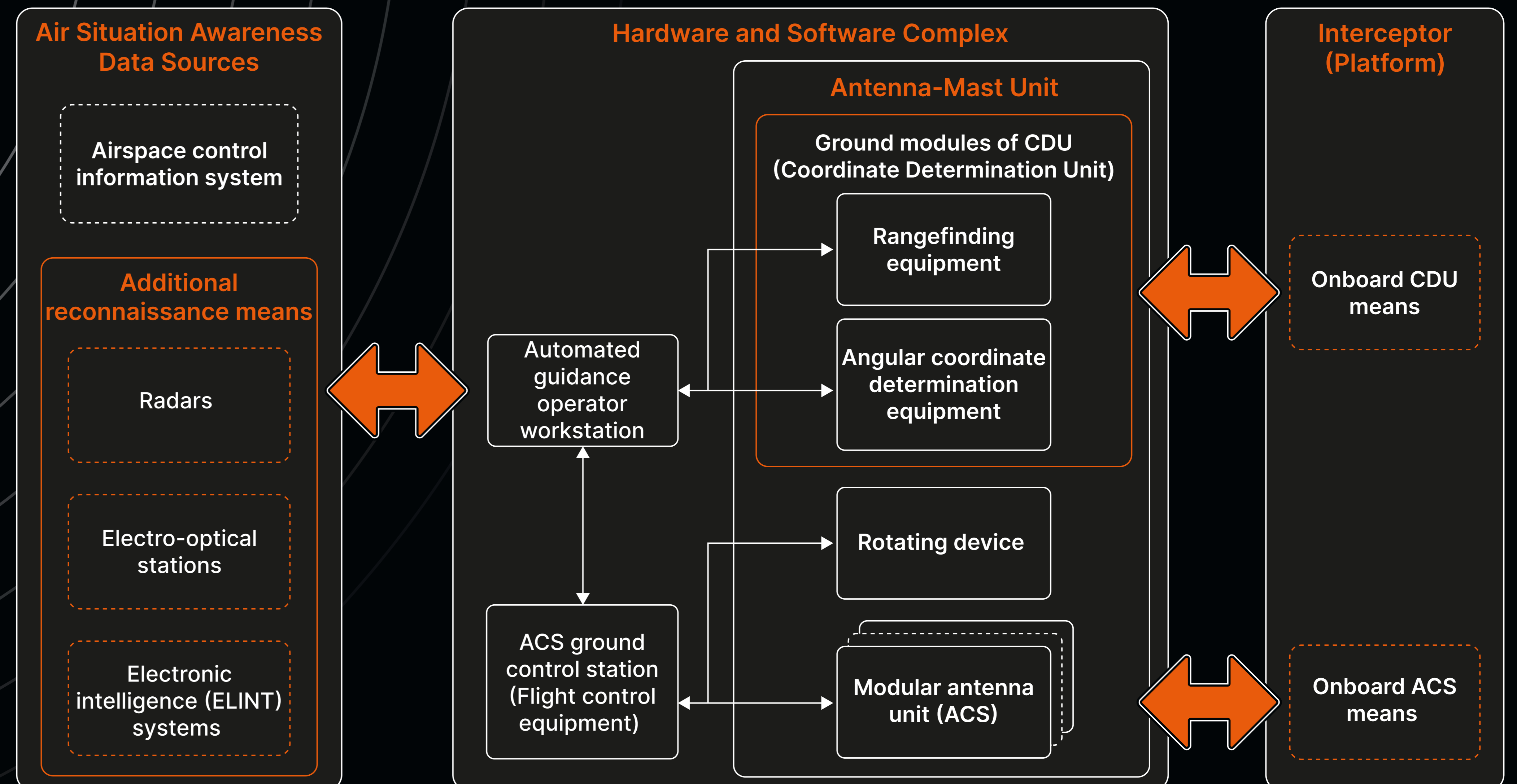
Enlock System is an intelligent system that automatically guides the interceptor drone to the hostile UAV. The operator only initiates the launch, and the system calculates the optimal route and brings the drone into the target engagement zone.

System components

- Operator's workstation in a shock-resistant case, with specialized software and a 24-inch screen
- Ground control station with antenna-mast unit
- Fixed-wing interceptor drone

Main specifications of the interceptor drone

- Maximum speed: 300 km/h
- Flight duration: up to 40 minutes
- Camera: daytime / thermal
- Interceptor drone range: 20 km
- Flight altitude: up to 5 km



Input Data for Calculating Forces and Means for Protecting Critical Infrastructure Objects



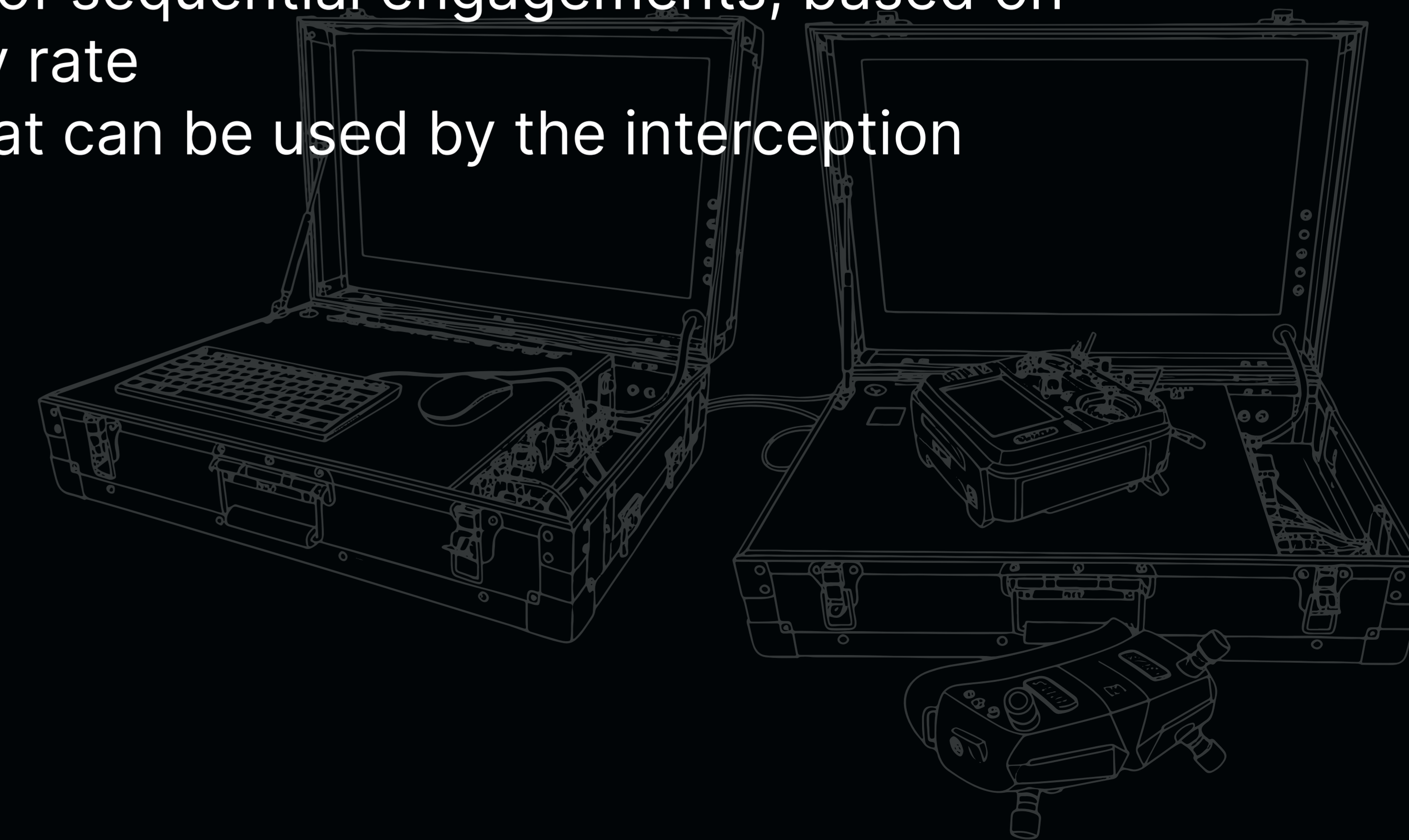
Reference data:

Area of the critical infrastructure $S_{ob} = 12 \text{ km}^2$

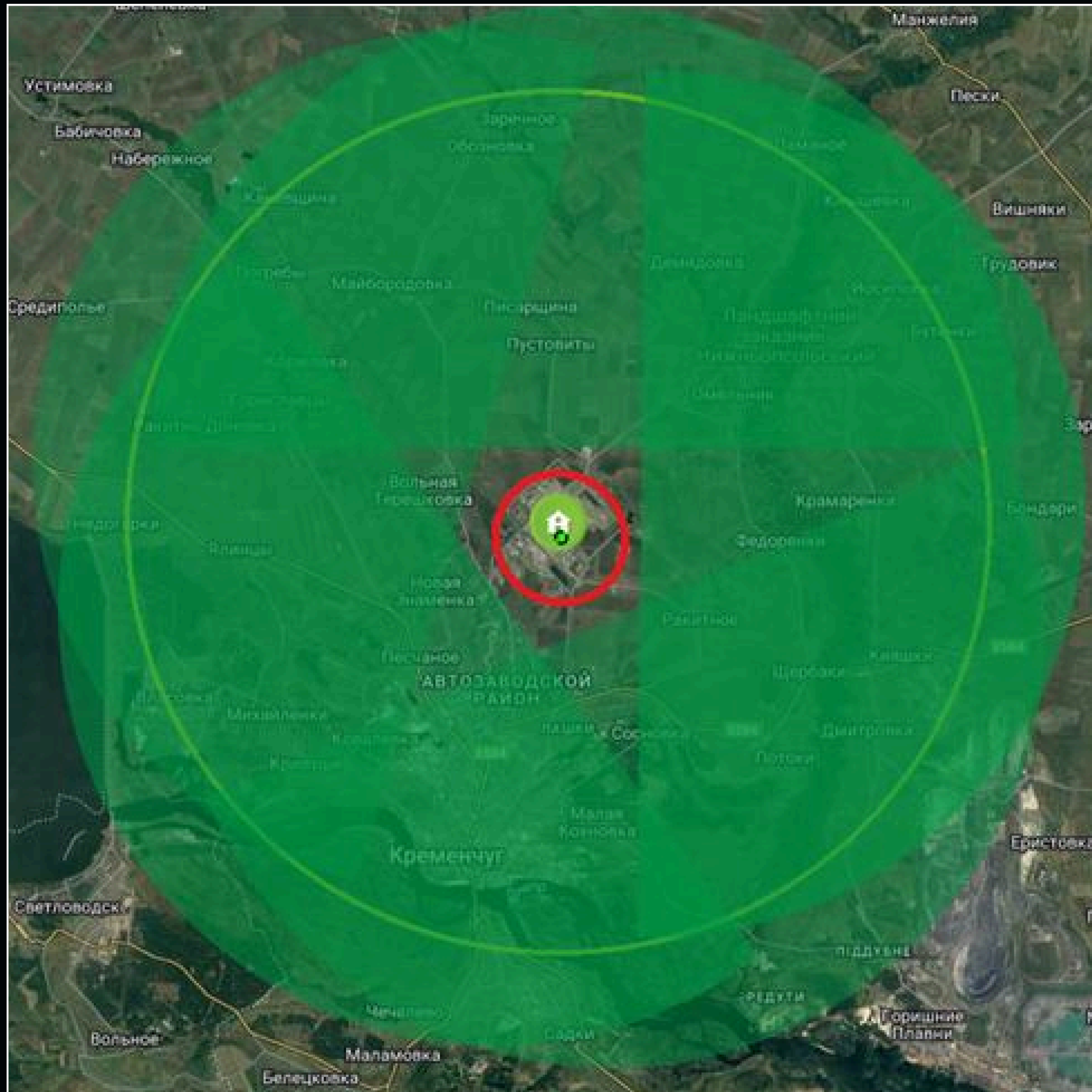
- $R_{\text{radar}} = 15 \text{ km}$
- $\beta_{\text{radar}} = 90 \text{ deg}$
- $K_{\text{radar}} = 1,25$
- $P_{\text{eng}} = 0,5$
- $k_{\text{eng}} = 1 \text{ or } 2$
- $K_{\text{norm}} = 0,9$
- $N_{\text{targets}} = 10$
- $N_{\text{eng.max}} = 3$
- $n_{\text{eng}} = 8$

Explanation of variables:

- R_{radar} – radar detection range for targets of a given type
- β_{radar} – radar scan sector
- K_{radar} – detection zone overlap multiplicity
- P_{eng} – probability of neutralizing a target of a given type with a single interceptor asset
- k_{eng} – number of interceptor assets that can simultaneously target one threat
- K_{norm} – target engagement norm coefficient
- N_{targets} – expected number of targets in a raid on a critical facility
- $N_{\text{eng.max}}$ – expected maximum number of sequential engagements, based on detection zone depth and target entry rate
- n_{eng} – number of interceptor assets that can be used by the interception group during raid defense



Airspace Control over Critical Infrastructure Objects



Minimum number of radars required to cover the facility — 5.

$$N_{\text{radar}} = 5$$

$$N_{\text{radar}} = \max\{N_{\text{radar}(\text{area})}; N_{\text{radar}(\text{sector})}\}$$

Calculation of the equivalent radius of the critical infrastructure object based on its known area — 1.732 km.

$$R_{\text{equiv}} = 1,732 \text{ km}$$

$$R_{\text{equiv}} = \sqrt{\frac{S_{\text{ob}}}{\pi}}$$

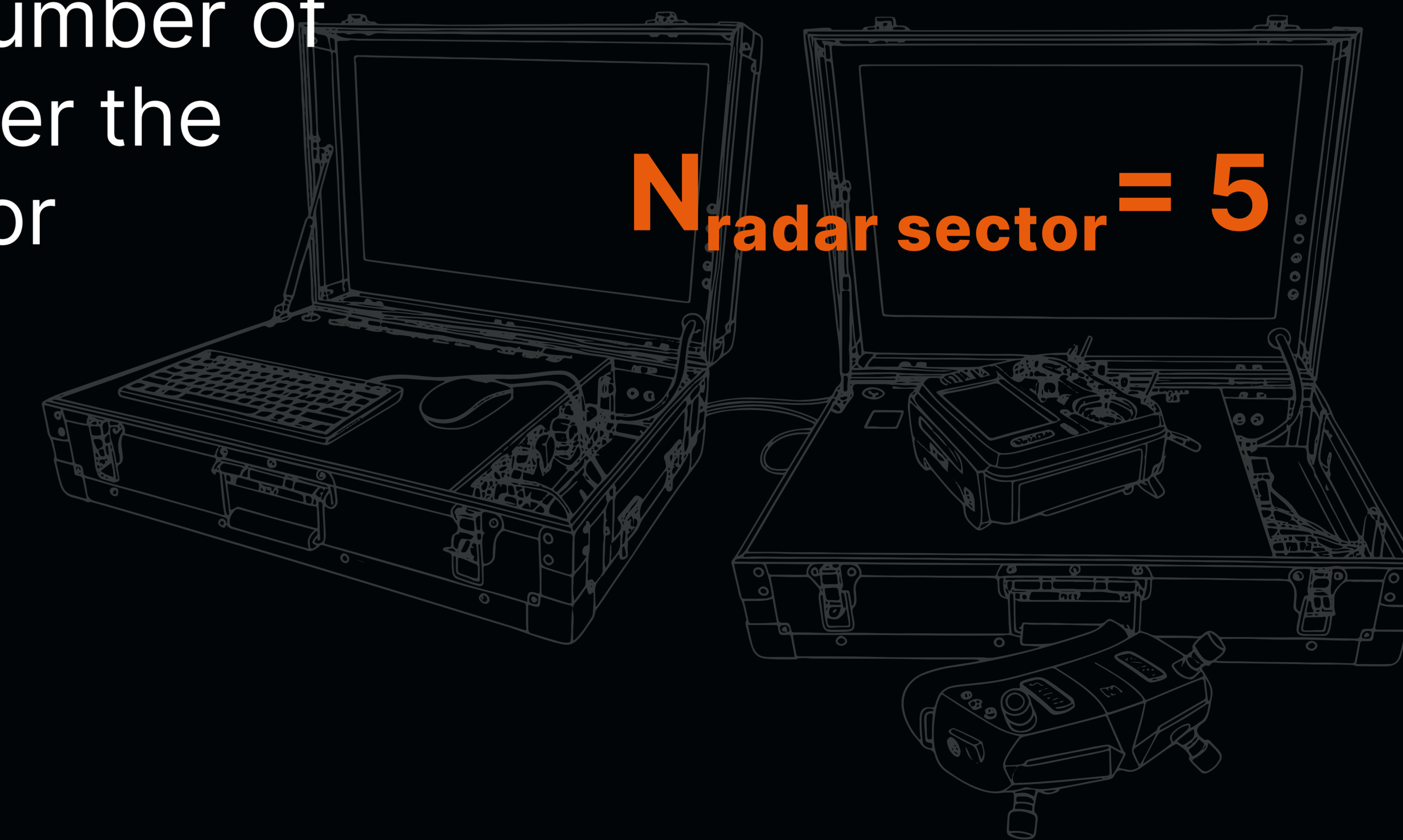
Calculation of the minimum number of radar stations required to cover the facility, by the detection area compliance criterion — 3.01.

$$N_{\text{radar area}} = 3,01$$

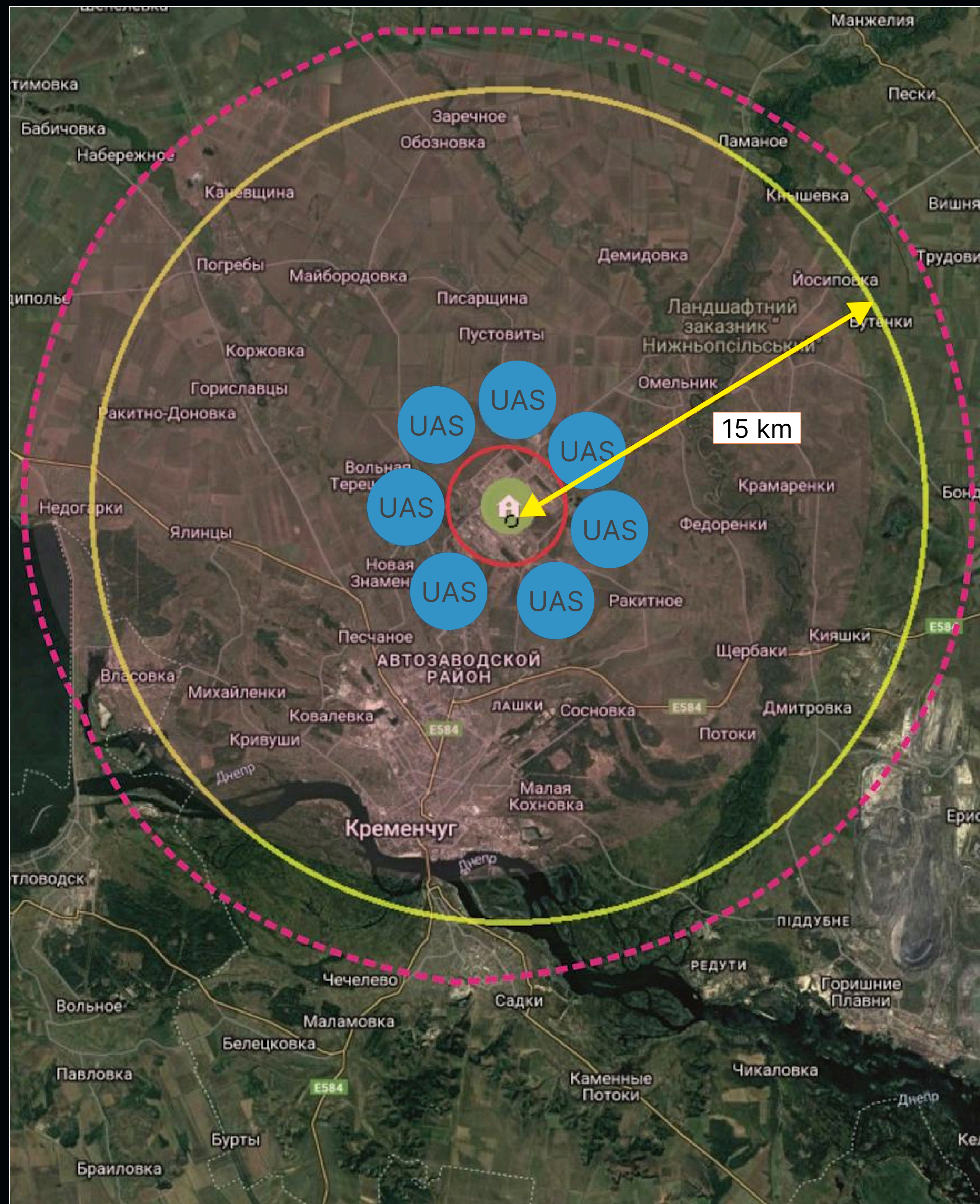
$$N_{\text{radar area}} \geq \frac{\pi (R_{\text{radar}} + R_{\text{equiv}})^2 - \pi R_{\text{equiv}}^2}{\frac{\pi R_{\text{radar}}^2}{2}} \times K_{\text{radar}}$$

Calculation of the minimum number of radar stations required to cover the facility, by the detection sector compliance criterion — 5.

$$N_{\text{radar sector}} \geq \frac{360}{\beta_{\text{radar}}} \times K_{\text{radar}}$$



Layered Anti-Drone Protection System for Critical Infrastructure Objects



Minimum number of interception groups N_{gr} , required to ensure object coverage, considering the possibility of directing 1 or 2 interceptor assets k_{yp} onto a single target.

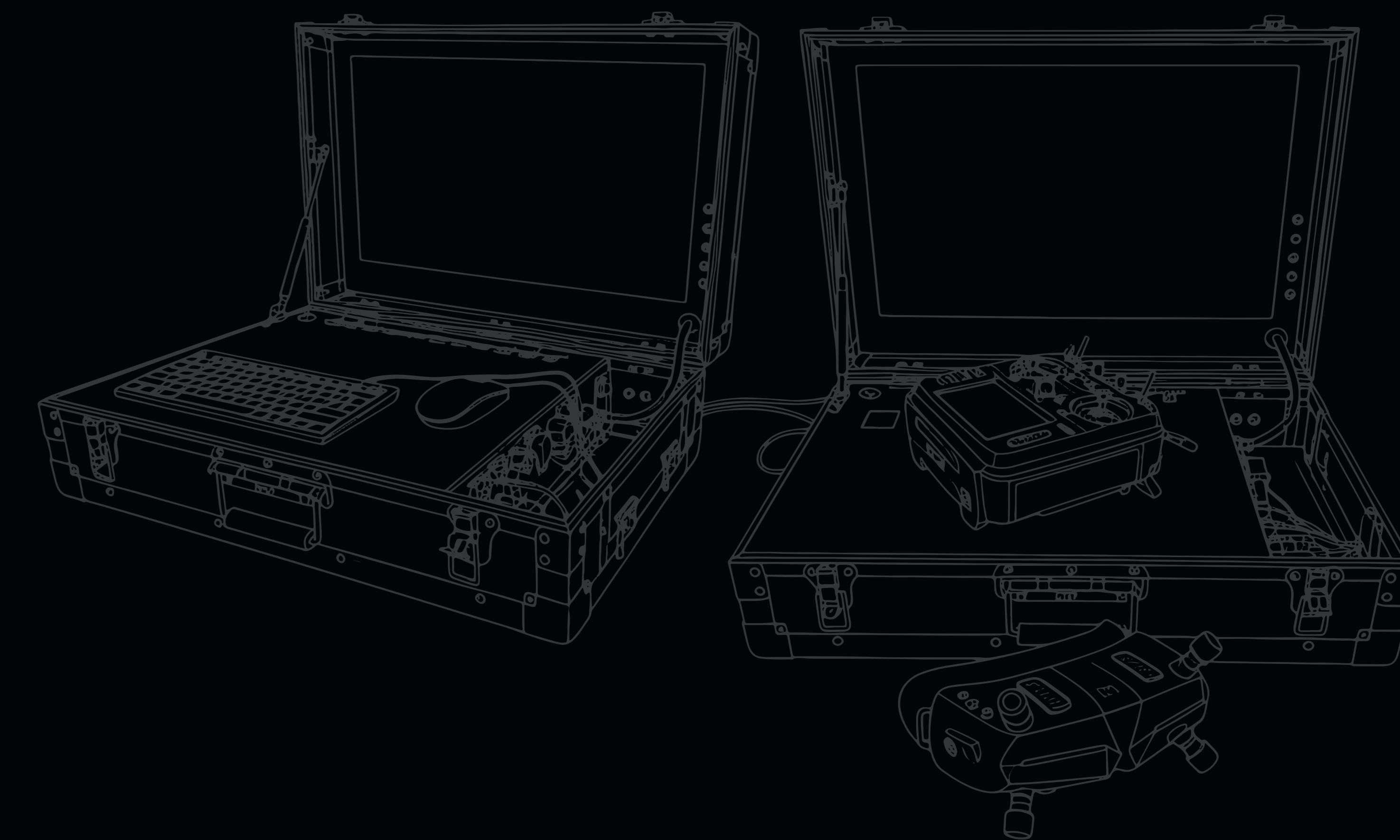
$$N_{gr} \geq 6,75 \quad \text{meaning} \quad N_{gr} \geq 7$$

Calculation of minimum number of interception groups:

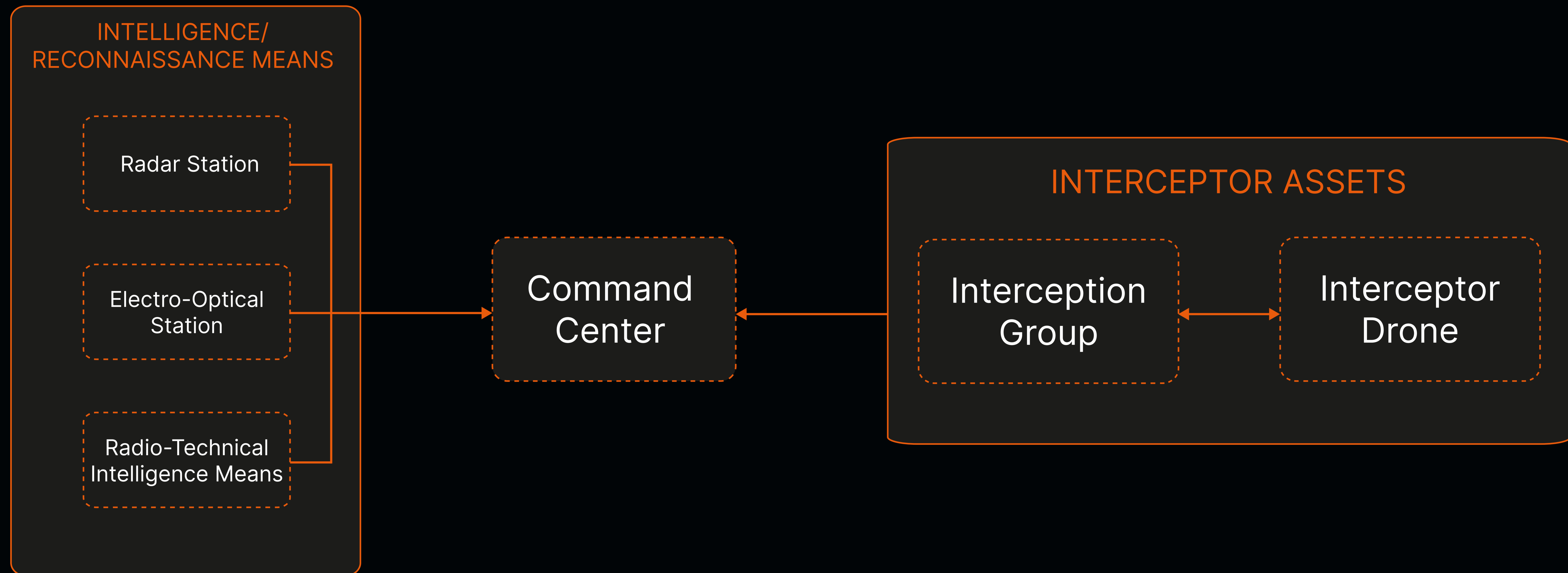
$$N_{gr} \geq \frac{N_{eng}}{N_{eng.max}} \quad \text{if} \quad N_{eng.max} \geq \frac{N_{eng}}{k_{eng}} \quad N_{gr} \geq \frac{N_{eng}k_{eng}}{N_{eng}} \quad \text{if} \quad N_{eng.max} > \frac{N_{eng}}{k_{eng}}$$

$$\text{Considering that } N_{eng.max} \leq \frac{N_{yp}}{k_{yp}}$$

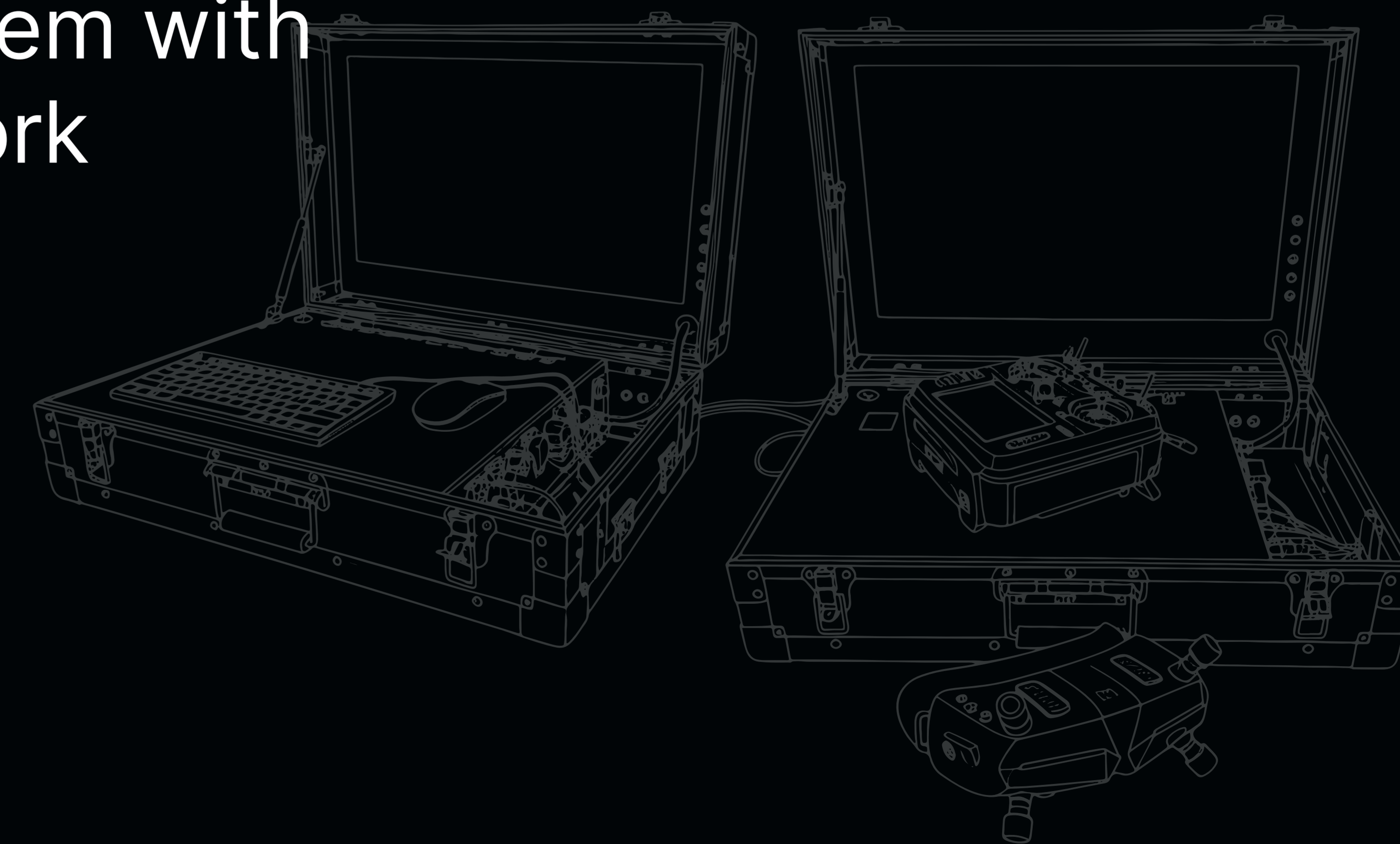
- The group's interception zone
- Unmanned Aerial System interception zone



General Model for Building Air Defense for Critical Infrastructure Objects



Design principle of a standalone protection system with an integrated closed communication network



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