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Raybird-3

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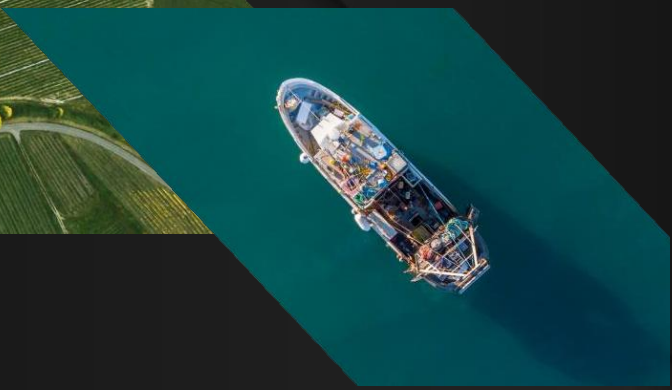
RAYBIRD-3

LARGE-SCALE AREAS SOLUTION



UNMANNED AIRCRAFT SYSTEM «RAYBIRD-3»

THE UAS «RAYBIRD-3»

cutting-edge unmanned aerial system (UAS) based on a long-range fixed-wing UAV designed to ensure non-stop air support providing unrivalled intelligence, surveillance and reconnaissance data for both commercial and defense projects

COMPOSITION:

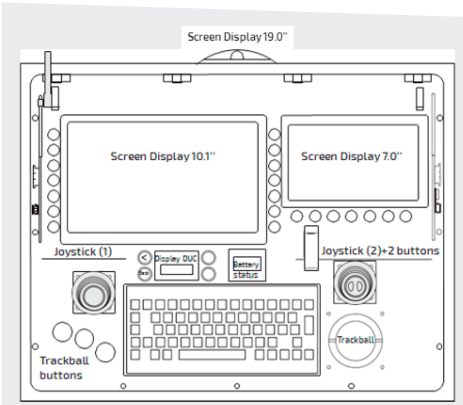
- UAV «Raybird-3»
- Ground control station (GCS) with Software
- Antenna system
- Launching unit
- Payload options

TECHNICAL SPECIFICATION

Wingspan	**2,96** m
MTOV	**23** kg
Speed	**90/120/160** km/h
Flight time	**18-28** h
Operating ceiling	up to **5000** m
Payload	up to **5** kg
Propulsion system	EFI engine | hydrogen fuel cell | electric motor
Fuel	**95** Octane, oil mix
Operating temperature range	from **-25°**C to +**45°**C
Take-off technique	mechanical catapult
Recovery system	parachute landing on airbag

GROUND CONTROL STATION

Displays	**3**
Weight	**22.9** kg
Run time	**6** hours
Operating temperature	**0~45**°C
Protection level of GCS when closed	**IP67**



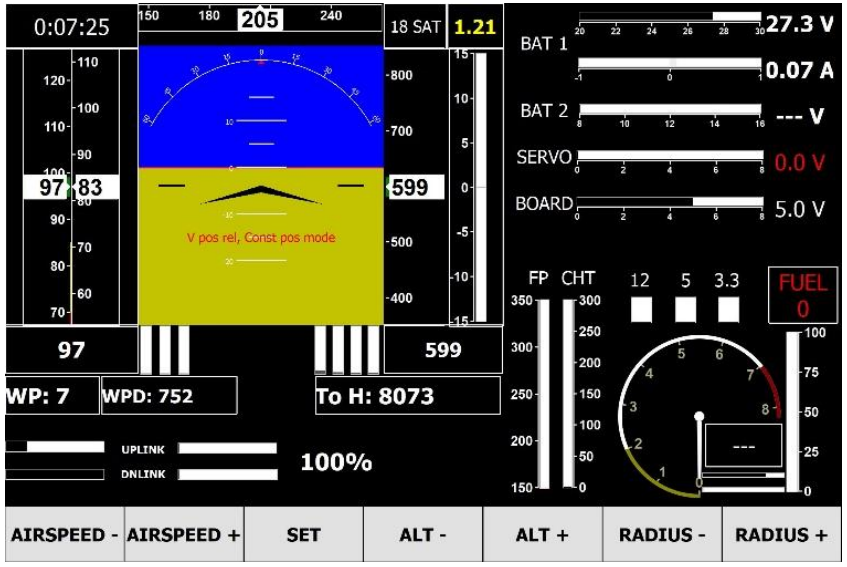
KEY FEATURES

- **3 displays** contain ultrabright screens with an anti-glare surface and can be switched via software
- **2 reliable** 3-axis joysticks with Hall's sensors
- PC mouse is replaced by moisture-proof and compact **trackball**
- **Full-fledged** waterproof keyboard for data entry
- **Multifunctional** assignable buttons around the display
- **Long endurance** battery life
- **2** Ethernet ports 48V 100W

SKY CONTROL SOFTWARE

CHARACTERISTICS

- Client-server architecture
- Multiple numbers of users and aircraft
- Adjustable language and units
- Differentiation of access rights
- Integrated payload software
- Graphical user interface



DATA LINKS

Digital data link ..... up to **120** km

Telemetry and control data link ..... up to **120** km

Maximum total range ..... up to **2500** km

- Telemetry and control system of in-house development
- Encrypted DDL, telemetry and control data link
- Frequency-hopping
- Direct Sequence Spread Spectrum (DSSS)
- Noise-like signal
- MIMO Mesh networks
- Multi-frequency global navigation satellite system (Multi GNSS)
- Duplex telemetry communication link

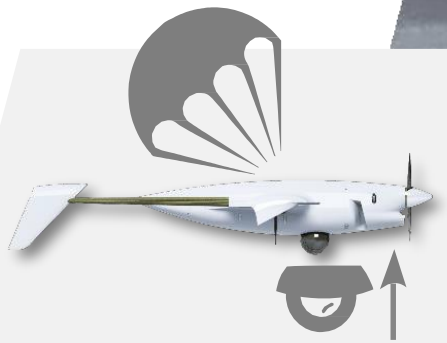
TAKE-OFF TECHNIQUE

Mechanical catapult type launching unit designed for quick and safe application at any time of the day, regardless of the surrounding conditions

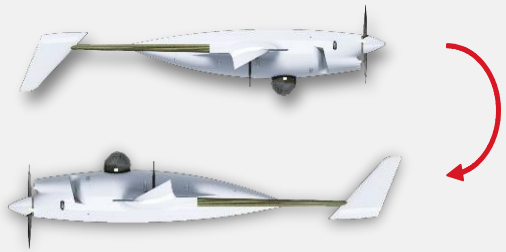
- Take-off from unprepared surfaces
- Safety features against spontaneous / unauthorized UAV launch
- Height for takeoff
  - normal – up to 1000 m ASL
  - extended – up to 2500 m ASL
- Man-portable and lightweight (45 kg)
- Tool-free assembly

LANDING TECHNIQUE

- Payload and UAV integrity during landing
- Automatic parachute/airbag recovery system
- Redundancy in critical subsystems
- Reusable airbag and parachute
- Highest durability of airframe on the market



Retracting mechanism



Flipping technique

PAYLOAD TYPES

Phase One – IXM

	iXM-100	iXM-50
Resolution	11664 x 8750	8280 x 6208
Dynamic range	83	84
Pixel size (µm)	3.76	5.3
Capture rate	3 fps	2 fps

For both models

Synchronization	50 µs in an array of cameras
Speed I/O interfaces	Trigger, Mid exposure, Ready, Serial
Dimensions *(including 80 mm lens)*	90 x 90 x 164 mm
Temperature	-10°C to 40°C
Humidity	15%-80% (non-condensing)

PAYLOAD TYPES

Synthetic Aperture Radar (SAR)

Size	W = 180 mm H = 111 mm Ø = 230 mm
Weight	4 kg
Frequency	X
Operating altitude	up to 5000 m
Moving target indicator	15 km
SAR imaging:	
• resolution	0,3, 0,5, 1, 2, 5, 10 m
• max range	20 km

PAYLOAD TYPES

Gyrostabilized Gimbal

Stabilization	<150 µrad
Size	140 x 189 mm
Environmental protection	IP64 rated
Operating temperature	-25°C to +45°C
Rotation limits	360° continuous pan

EO SENSOR

Global shutter	Yes
Vertical FOV	37.9°–1.3°
Resolution	HD 720p 1280 x 720 px
Optical zoom	30x

IR SENSOR

Type	LWIR uncooled
Resolution	SD 640x512 px
IR lens	60 mm
Vertical FOV	7.7°

LASER RANGEFINDE CLASS | (EYESAFE)*

Type	Diode laser
Range	up to 5000 m *(static applications)*; up to 2500 m *(dynamic applications)*
Accuracy	Better than 1 m

* Additional options

PROCESSOR SPECIFICATIONS

Object tracking (thermal vision)

Object tracking

Scenesteering

Moving Target Indicator

Gyrostabilized Gimbal

FEATURES

- Object tracking
- Scene steering
- Software stabilization HD
- Video output
- Onboard Video
- Recording Snapshots
- H.264 encoding
- Moving Target Indicator
- Geo-Location Feature

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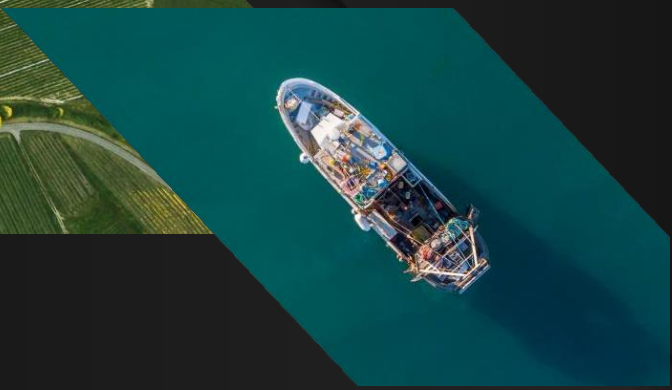
USE CASES

TAILORED SOLUTIONS GEARED TO YOUR NEEDS



PREVENTING WILDFIRES

RECOMMENDED TOOLS

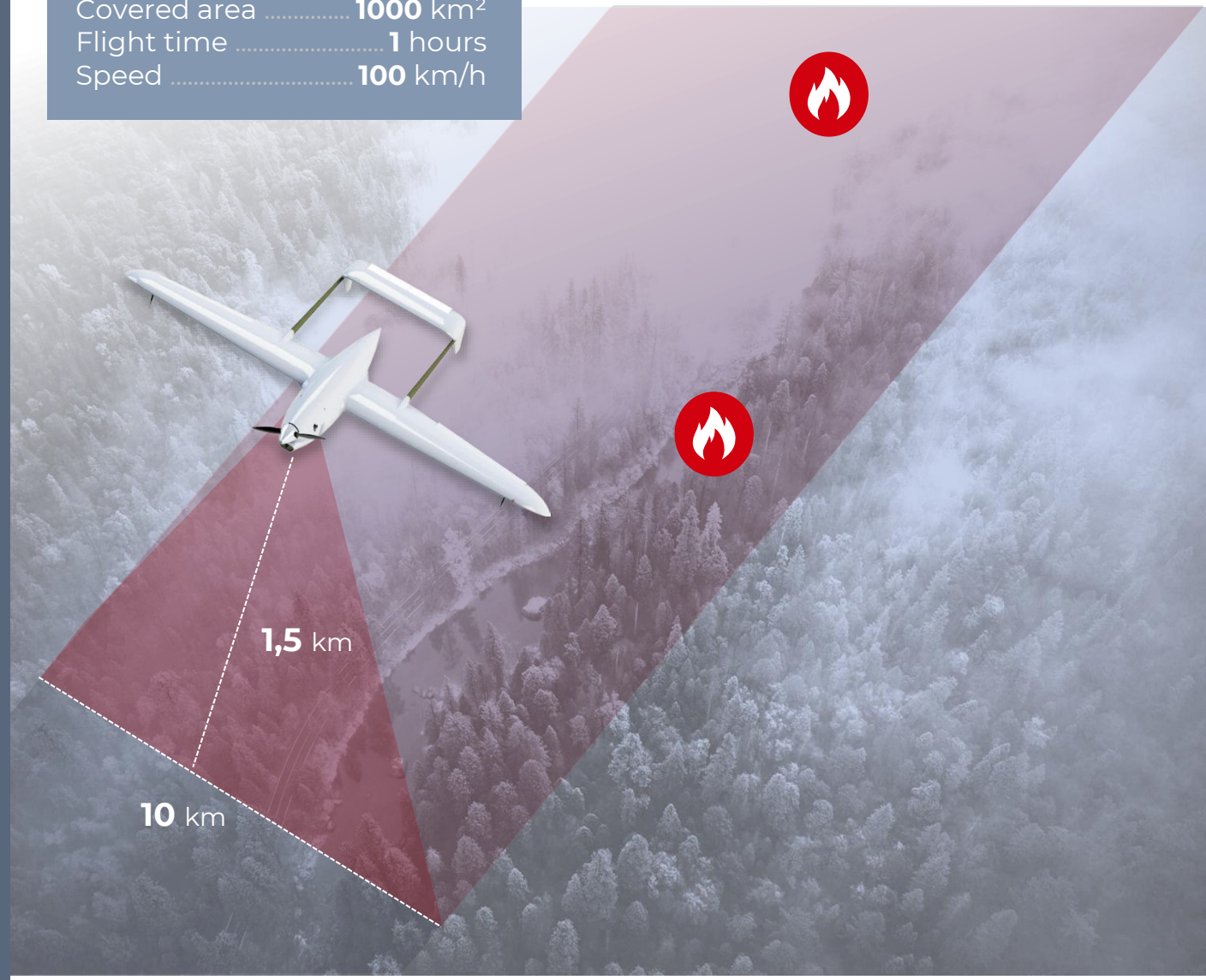
- Gyro-stabilized multi-sensor wide view gimbal
- Early fire detection sensor

SOLUTION:

- Aerial reconnaissance of the fire situation in the fire season
- Coordination of firefighting operations
- Identification of dangerous «hot zones», «marking» of dangerous areas to help firefighters in planning and coordinating their actions
- Survey of natural disasters areas

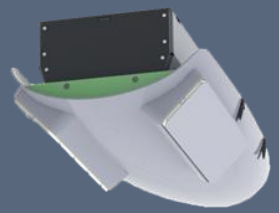
USE CASE

Covered area ..... **1000** km²
Flight time ..... **1** hours
Speed ..... **100** km/h



MARITIME SURVEILLANCE

RECOMMENDED TOOLS



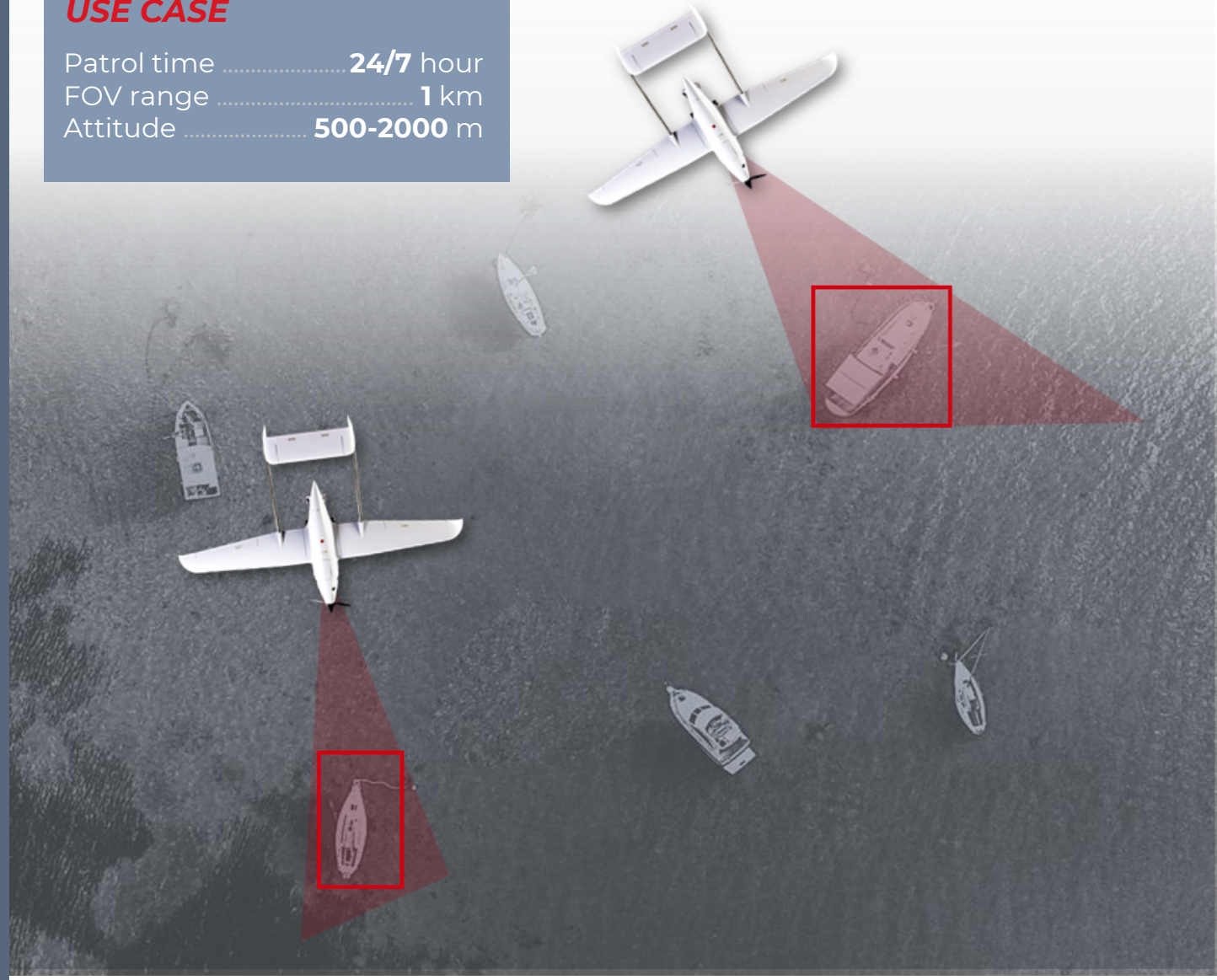
- SAR
- Gyro-stabilized multi-sensor gimbal

SOLUTION:

- 24/7 air support of maritime operations
- Detection of illegal activities (drug trafficking, fishing)
- Illegal pollution detection and monitoring
- Moving target indicator

USE CASE

Patrol time ..... **24/7** hour
FOV range ..... **1** km
Attitude ..... **500-2000** m



MAPPING AND AERIAL SURVEYING

RECOMMENDED TOOLS

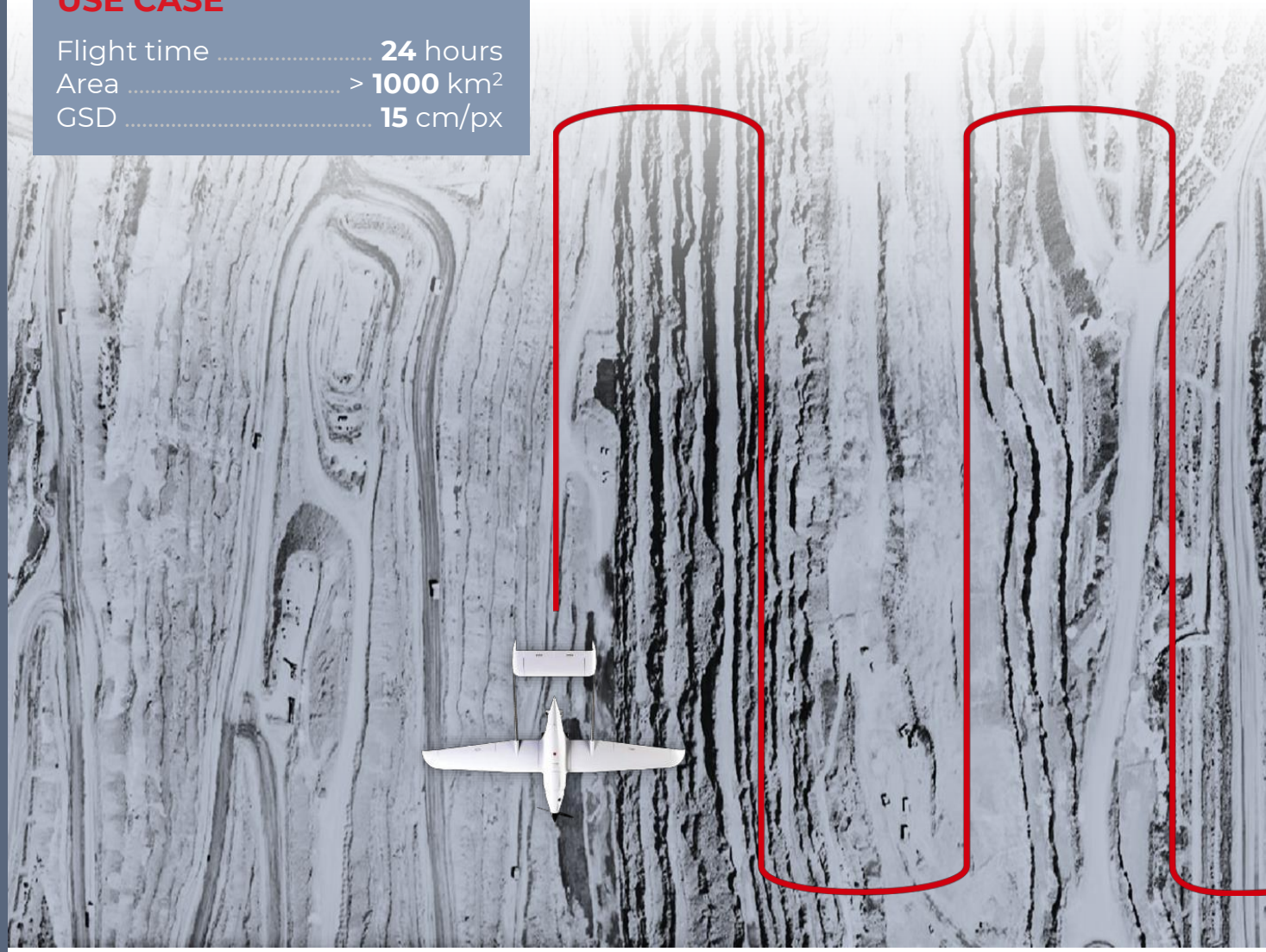
- Photo camera

SOLUTION:

- Photographic insight into hard-to-reach territories
- High accuracy of aerial surveys
- High precision mappings
- Reduction field time and survey costs
- Fast delivery of a range of aerial survey outputs

USE CASE

Flight time ..... **24** hours
Area ..... > **1000** km^2
GSD ..... **15** cm/px



MAPPING AND AERIAL SURVEYING

POWER LINES INSPECTION

- Execution of large-scale aerial photography of the transmission power line route (M 1:1000 – 1:10000)
- Definition of damage to insulators on poles
- Height Determination of wire and cable fastening on support of the transmission line
- Identification of zones of landslide and karst processes and monitoring of dynamics of their development

INSPECTION OF ROADS

- Operative diagnostics of a road surface
- Traffic flow control
- Accurate determination of the type and extent of damage to the roadway
- Monitoring of bridge crossings, dimensions and other engineering structures
- Early detection of dangerous man-made phenomena (suffusion, karst phenomena, flooding, etc.)
- Collection of operational information in emergency situations in the right-of-way

3D MODELLING

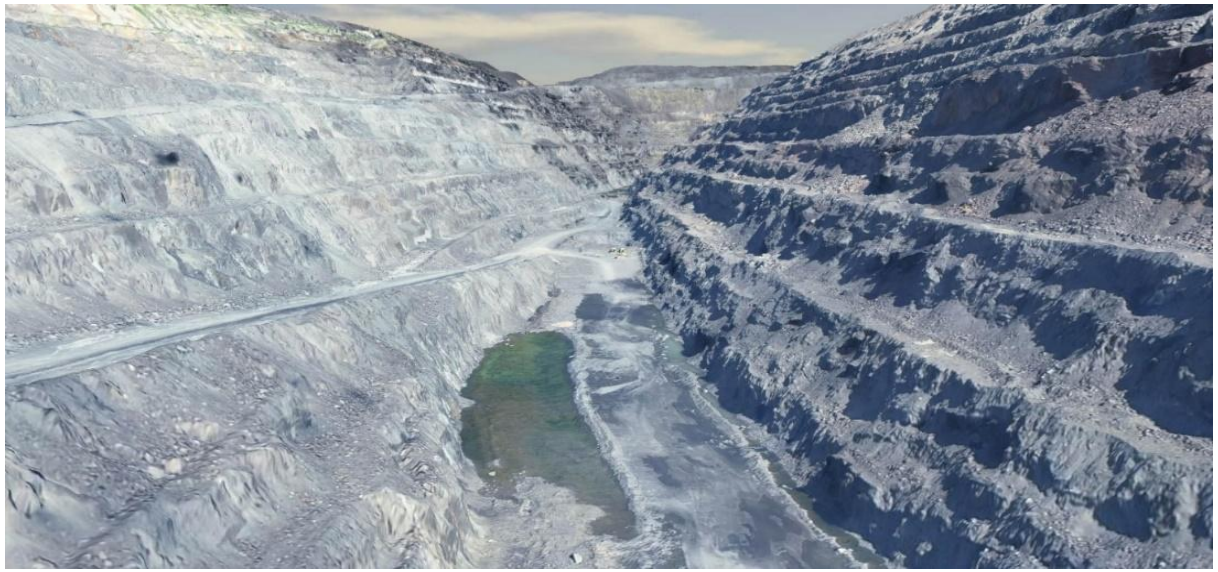
RECOMMENDED TOOLS

- Photo camera

STAGES OF WORK ON SITE:

I. Pre-flight site assessment and development of a proper survey program
II. Aerial Data Acquisition (getting a digital content for further processing)
III. Data processing and map formation

Open-pit 3D plan



PIPELINE MONITORING

Aerial photography and video surveillance

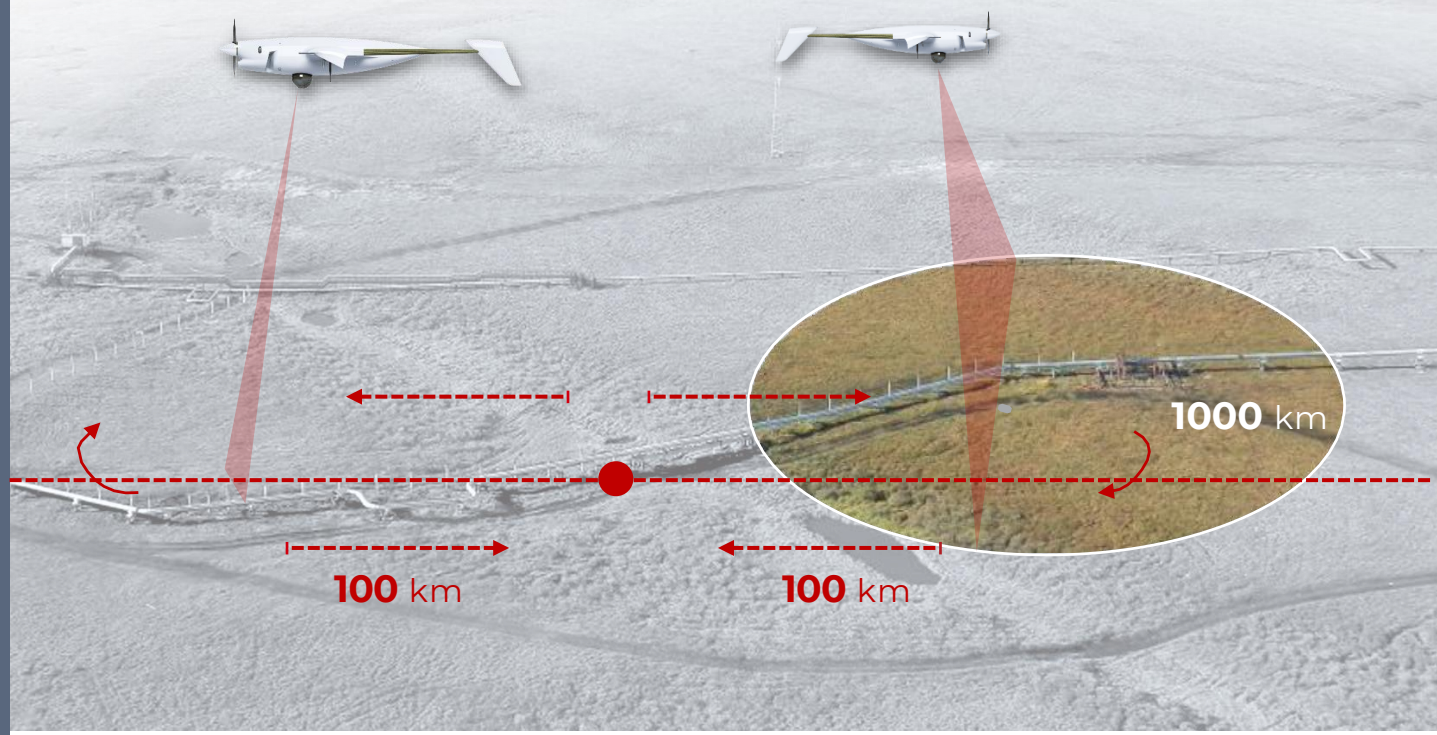
RECOMMENDED TOOLS

- Gyro-stabilised multi-sensor gimbal
- Photo camera

SOLUTION:

- continuous visual surveillance of the area around pipeline
- explicit qualitative assessment of object's condition

- High-quality snapshots of the pipeline, auxiliary equipment and surrounding infrastructure
- Infrared images for detection of damages in the pipeline, where oil leakage is possible
- 2D ortho mosaics and 3D virtual models of pipeline and surrounding environment
- HD video record of pipeline which enables visual real time observation and assessment of its condition



IMPROVED BORDER SURVEILLANCE

RECOMMENDED TOOLS

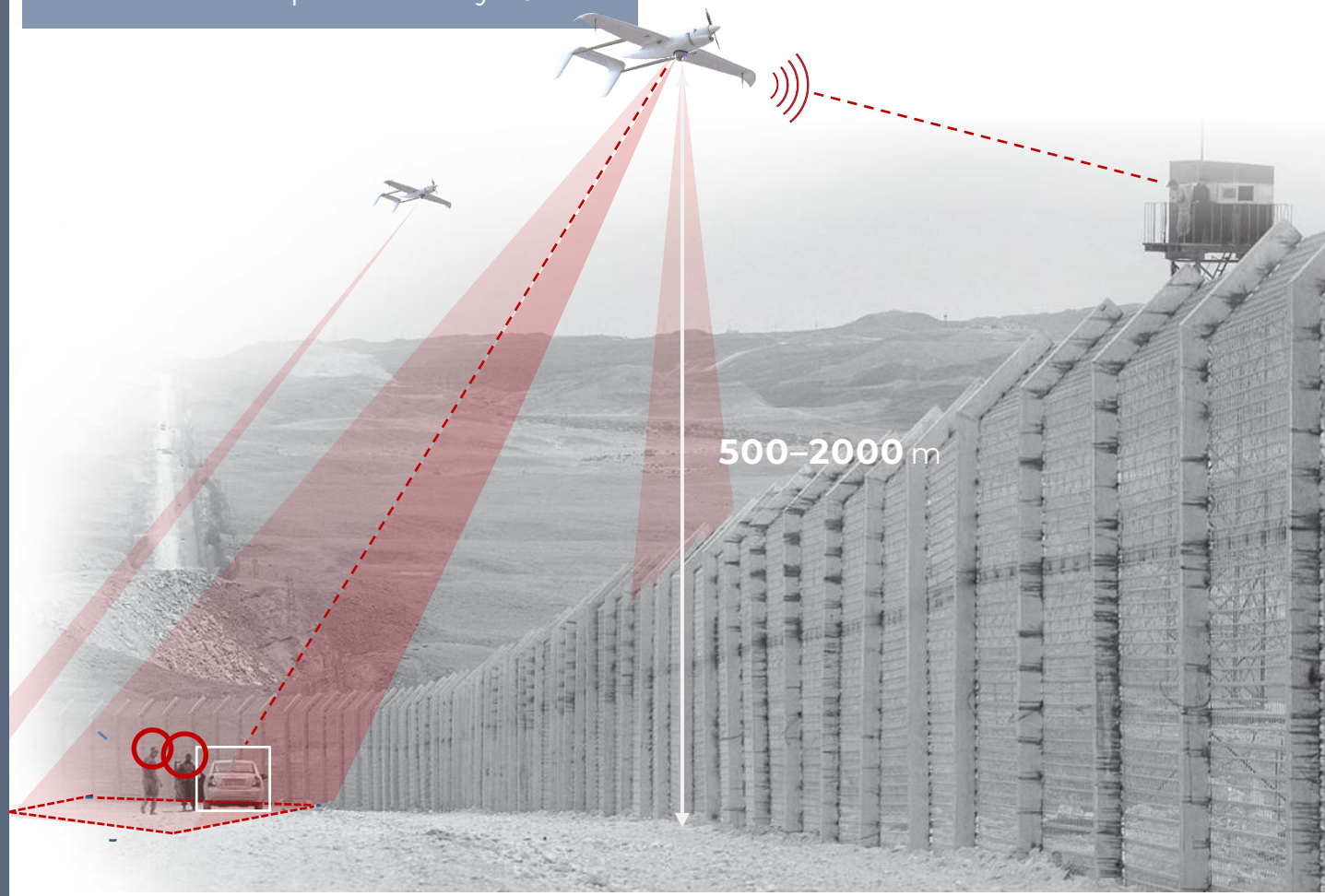
- Gyro-stabilized multi-sensor gimbal

SOLUTION:

- 24/7 border patrol
- Target identification and tracking

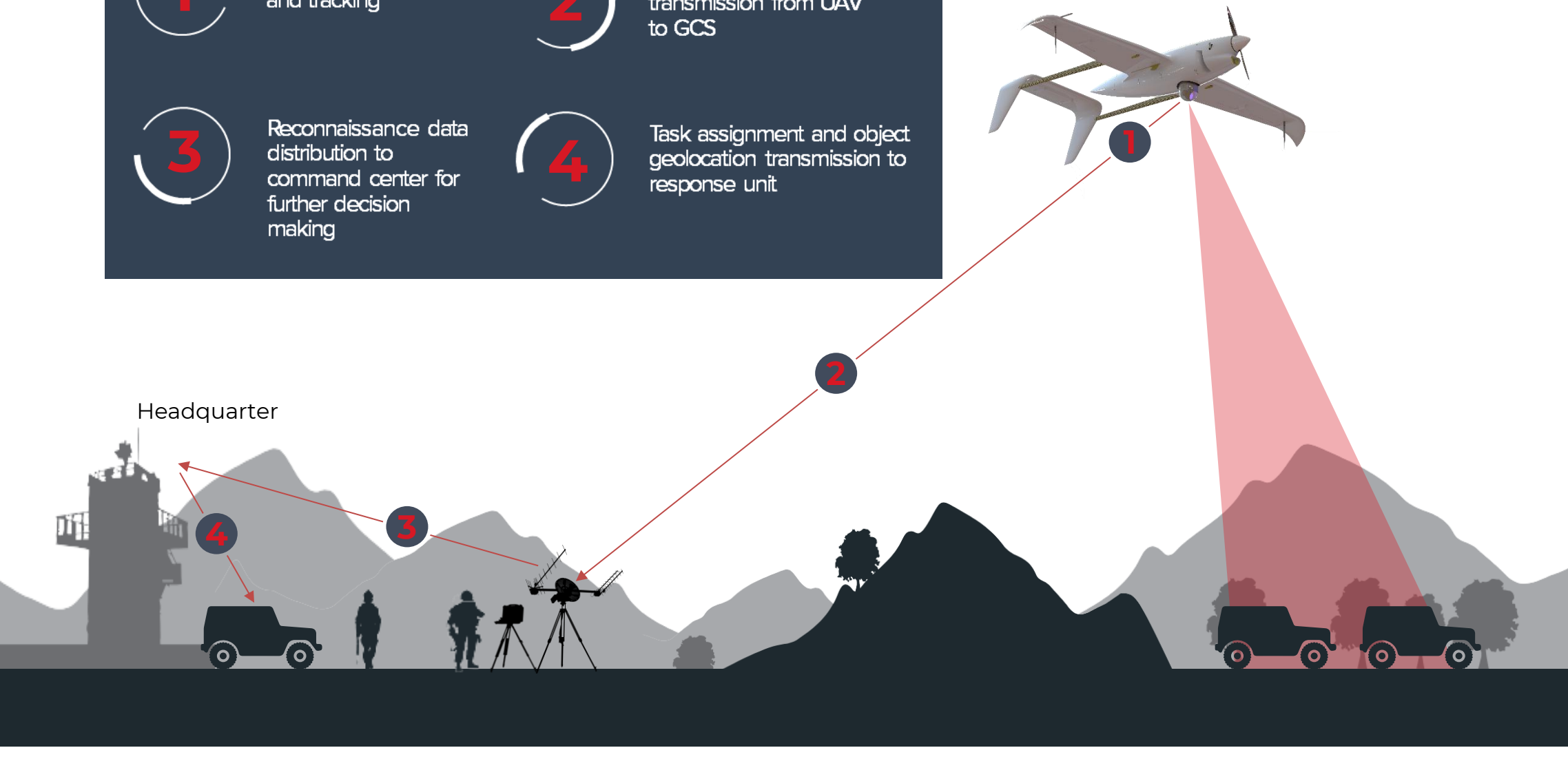
USE CASE

Border length ..... **800** km
Patrolled route section ..... **40** km
Speed ..... **120** km/h
En-route data update .... every **20** min



RECONNAISSANCE MISSION

1. Target detection and tracking
2. Reconnaissance data transmission from UAV to GCS
3. Reconnaissance data distribution to command center for further decision making
4. Task assignment and object geolocation transmission to response unit



TRAINING COURSE «OPERATION AND MAINTENANCE OF THE UNMANNED AIRCRAFT SYSTEM «RAYBIRD-3»

PURPOSE:

to provide a comprehensive training for future professionals. It provides both the necessary theoretical knowledge and practical skills to operate the unmanned aerial system «Raybird-3»

DURATION:

45 days (240 academic hours)

The training course consists of 2 phases: Theoretical and Practical (flight and UAS maintenance)

PLACE:

Lectures are held at Skyeton facilities, Kyiv, Ukraine

Practical classes – at Skyeton facilities, Kyiv, Ukraine; at local airfield, Ukraine

KEY TOPICS

- The general aeronautical knowledge
- Application of the UAS in the context of international air law
- Accommodating UAS operations within the current aviation infrastructure
- General information about the service and technical characteristics of the UAV
- The requirement for the operator to demonstrate flight safety and how this is achieved
- Implementation of technology to help control risks and hazards
- Provision of an environment for safe operation
- Typical use cases

Upon completion of the training course, trainees should pass the qualification exam. After the exam is completed successfully, the operators receive certificates confirming the following qualifications: «UAS Operators», «Payload Operator» and «Maintenance specialist»

ADDITIONAL SOLUTIONS

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ADDITIONAL EQUIPMENT

ADS-B transponder «Ping200Sr»

Provides airspace users and air traffic controllers with air situational awareness to safely share common airspace by manned and unmanned aircraft, avoiding the risk of collision

TACTICAL DISMOUNT SOLUTION

Data transmission device to ensure mission-critical communication in tactical applications

- **ANTENNAS**
- **GPS**
- **RUGGED DONGLE FOR WIFI**
- **MULTIFUNCTIONAL SWITCH**
- **OBSCURA RUGGED BODYWORN IP CAMERA**
- **PUSH-TO-TALK (PTT)**
- **POWER OPTIONS (single charge – 12 h of operation)**

- AES128/256 encryption
- IP68 construction
- Self-healing, self-forming Mobile Ad Hoc Networking (MANET)
- High data throughput rates
- Radios combine to form single frequency network
- Your choice of licensed bands: 400MHz to 6GHz

MN-MIMO utilizes the latest advances in military technology to provide wireless video and data communications in the harshest environments where traditional systems fail

Touting COFDM modulation, up to 4x4 MIMO, and mesh networking capability, MN-MIMO has been proven to provide longer range, better reliability, and higher data rates than any commercial or military wireless standard available today

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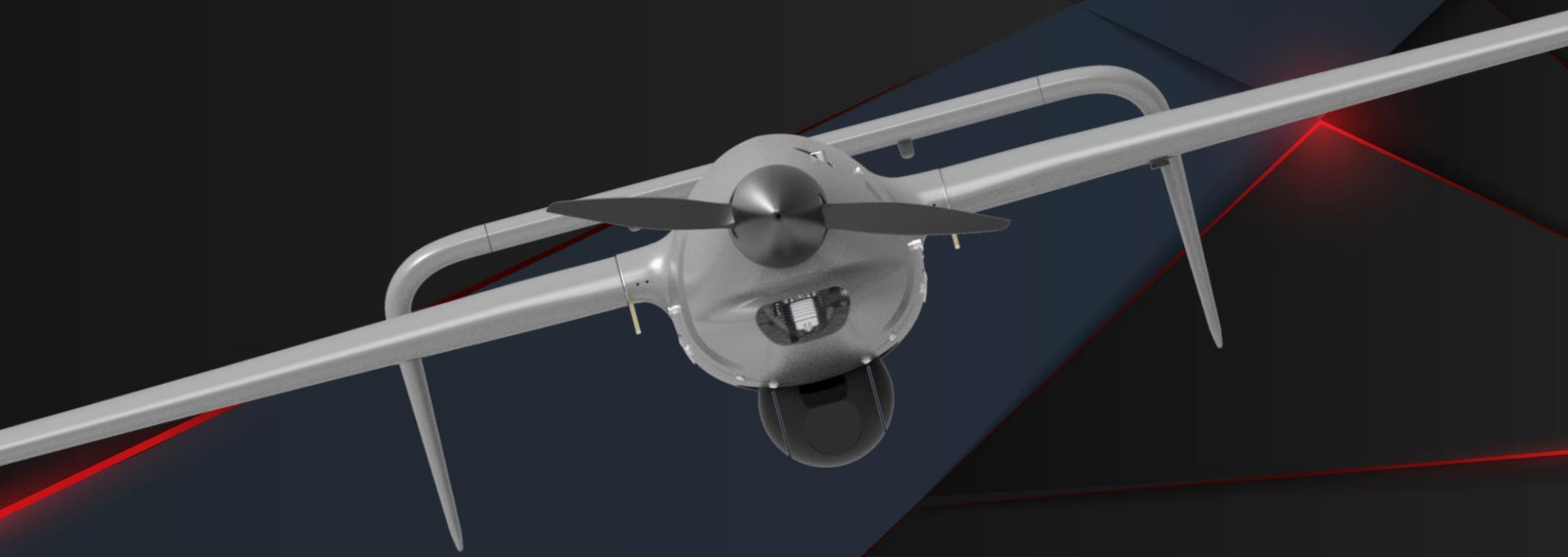

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