

COBRA  
CICADA



# CHALLENGES

Cicada

Cobra

Aeromagnetic survey



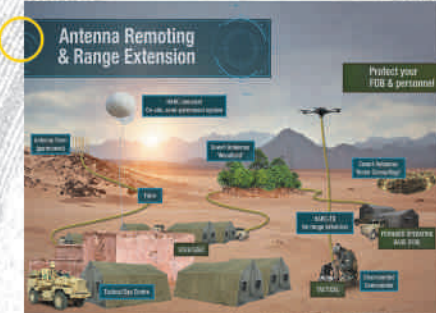
Search and rescue operation



Border Control



Retranslation application



Public safety/events



Forest fire detection



UAVs for land and coastline operation

Industrial, defense and humanitarian application



# RETRANSLATION APPLICATION

Recommended tools

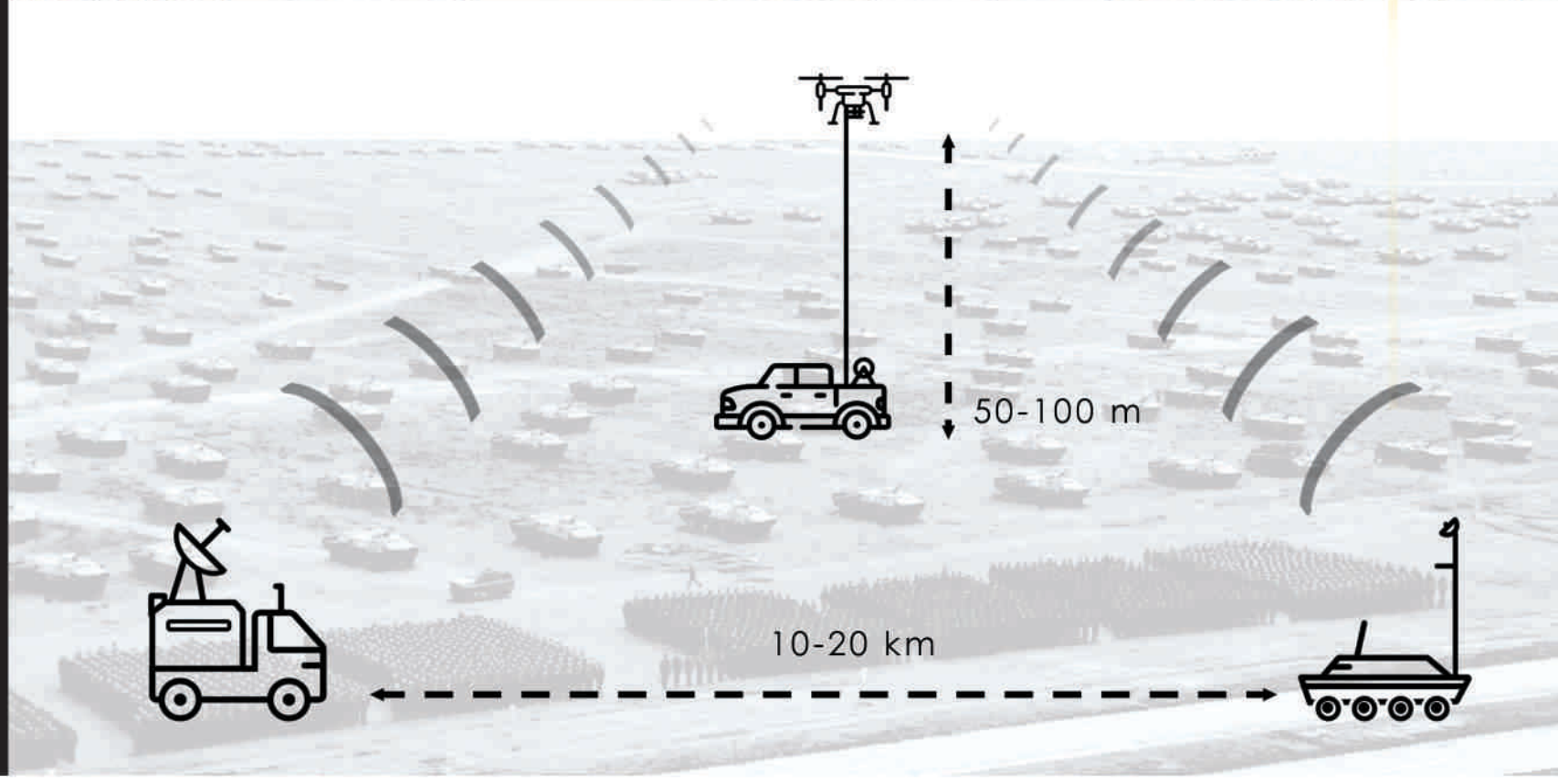
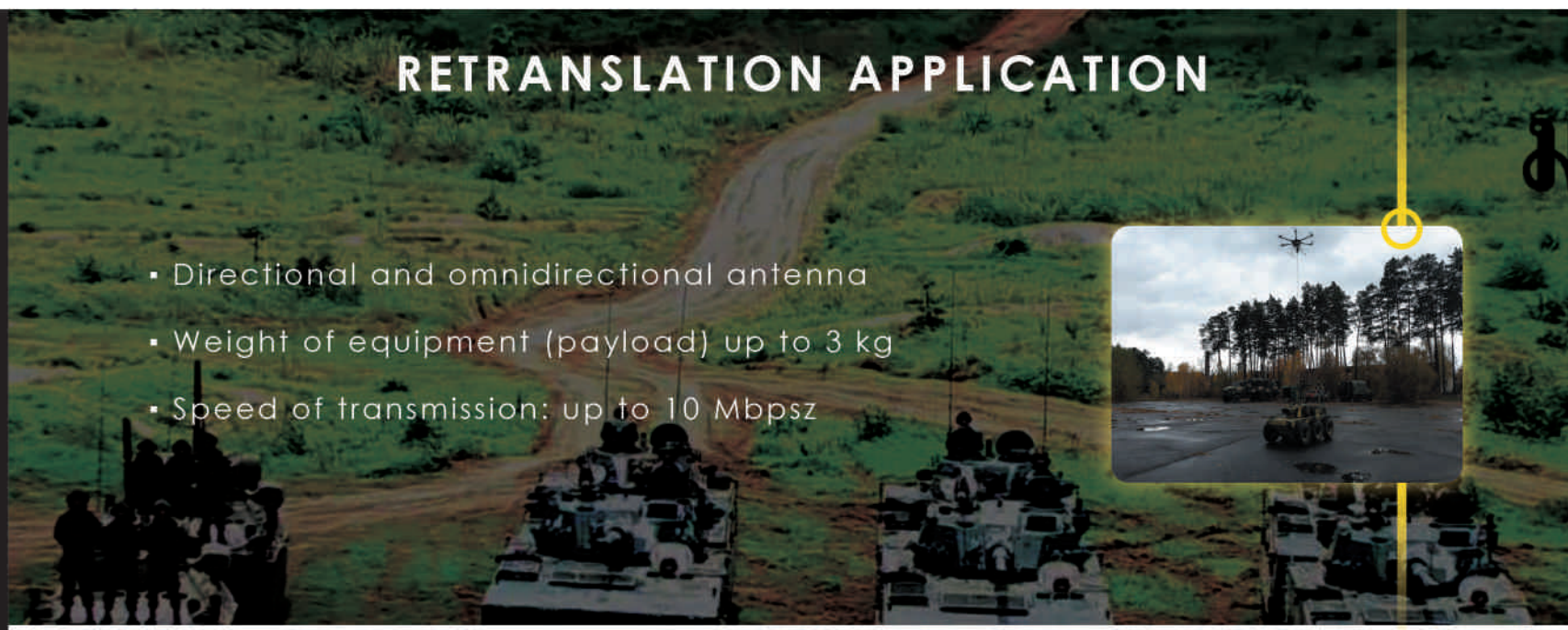


- Directional and omnidirectional antenna
- Weight of equipment (payload) up to 3 kg
- Speed of transmission: up to 10 Mbpsz



Telecommunication Equipment

- Solution:
- Mesh-network creation
  - ISTAR and communication tasks



# PUBLIC SAFETY/EVENTS

Recommended tools



High stabilized gimbal with 36X zoom camera

Solution:

- Alert about human stampedes
- Coordination during military training
- Crowd control during large public event



Continuously supplied with power



Drone keeps position



80-100 meters height



10 consecutive hours

Cobra ranges of up to detect people at night with thermal camera (IR) at up to 700m (2,200'), detect vehicles at night at up to 1800m (6000').

Cobra detect people during day with electro optical (EO) camera at up to 2,000m (6,562'), detect vehicles at up to 5,000m (16,404')



Recommended tools



Gyro-stabilised multi-sensor wide view gimbal

Solution:

- Early fire detection
- Coordination firefighter squads



# FOREST FIRE DETECTION



Total area burned **34.399 km<sup>2</sup>** in USA



**55.911** wildfires per year



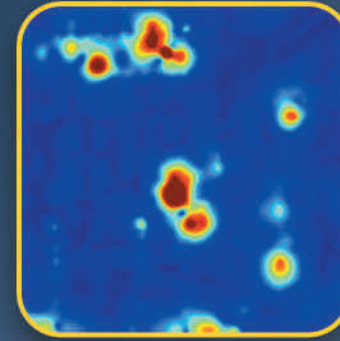
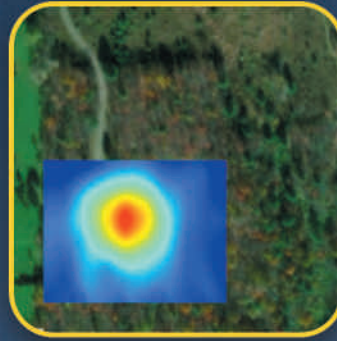
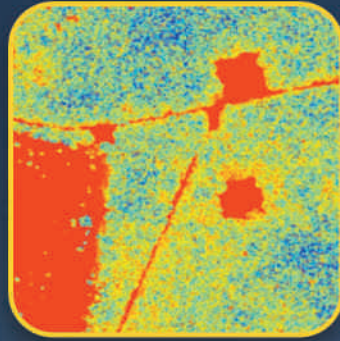
Suppression expenditures **974 mln USD**/year

Covered area.....300 km<sup>2</sup>  
Flight time.....24/7  
Quantity.....1



# AEROMAGNETIC SURVEY

Recommended tools



MagPike  
(based on MFAM)

Solutions:

- UXO detection
- Mineral exploration
- Identify boreholes

## Mission1: Geology/Metals exploration

- Speed of operation - 10 m/s
- Altitude of operation - 50 m
- Spacing - 50 m

Duration - 1.5 hours  
Drone can cover - 2.4 km<sup>2</sup>  
Around 10 km<sup>2</sup> per day

More details:  
Spacing - 100 m - 4.8 km<sup>2</sup>  
Spacing - 200 m - 9.6 km<sup>2</sup>

## Mission2: Demining/UXO detection

- Flight speed of operation - 2-3 m/s
- Flight height of operation - 4-8 m
- AngelView - 2-4 m

Duration 1,5 Hour  
UAS can cover - 20 000 m<sup>2</sup>  
Around 80 000 m<sup>2</sup> per day

More details:  
Definition of an area containing  
UXO/EOD/ERW/LANDMINES



Recommended tools



# SEARCH AND RESCUE OPERATION



Altitude up to 1000 meters



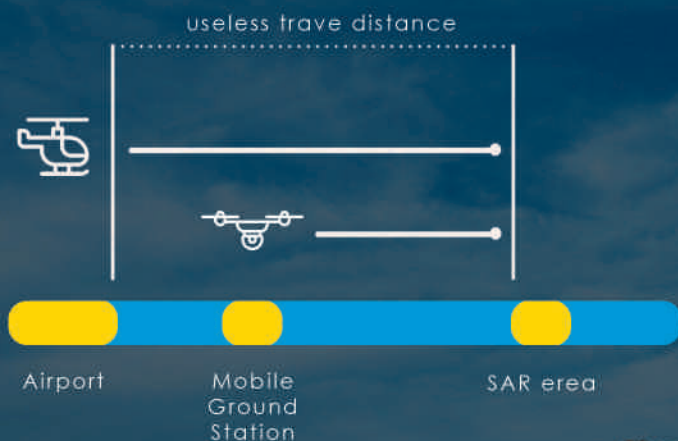
Travel around 60 kilometers



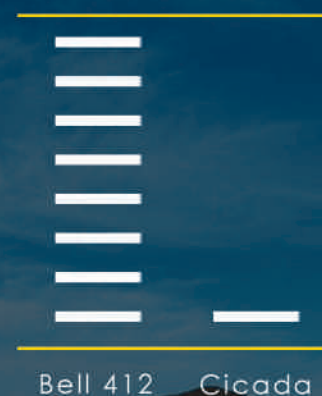
Zoom and Thermal Cameras

Solution:

- Coordination of SAR operation
- Post-disaster data collection
- Wildfires detection



Fuel per hour



During the flight on low altitude, helicopter will use even more fuel than average flight, which is also not cheap. On low altitude, it can be 300\$ – 400\$ per hour, while hybrid UAV Cicada will use 1\$ – 2\$ per hour. The difference is huge! 1000 hours of Cicada flight will cost like 3 hours of search and rescue plane flight. Now imagine 10-100 helicopters were used during the SAR, and it is only about fuel.



Recommended tools



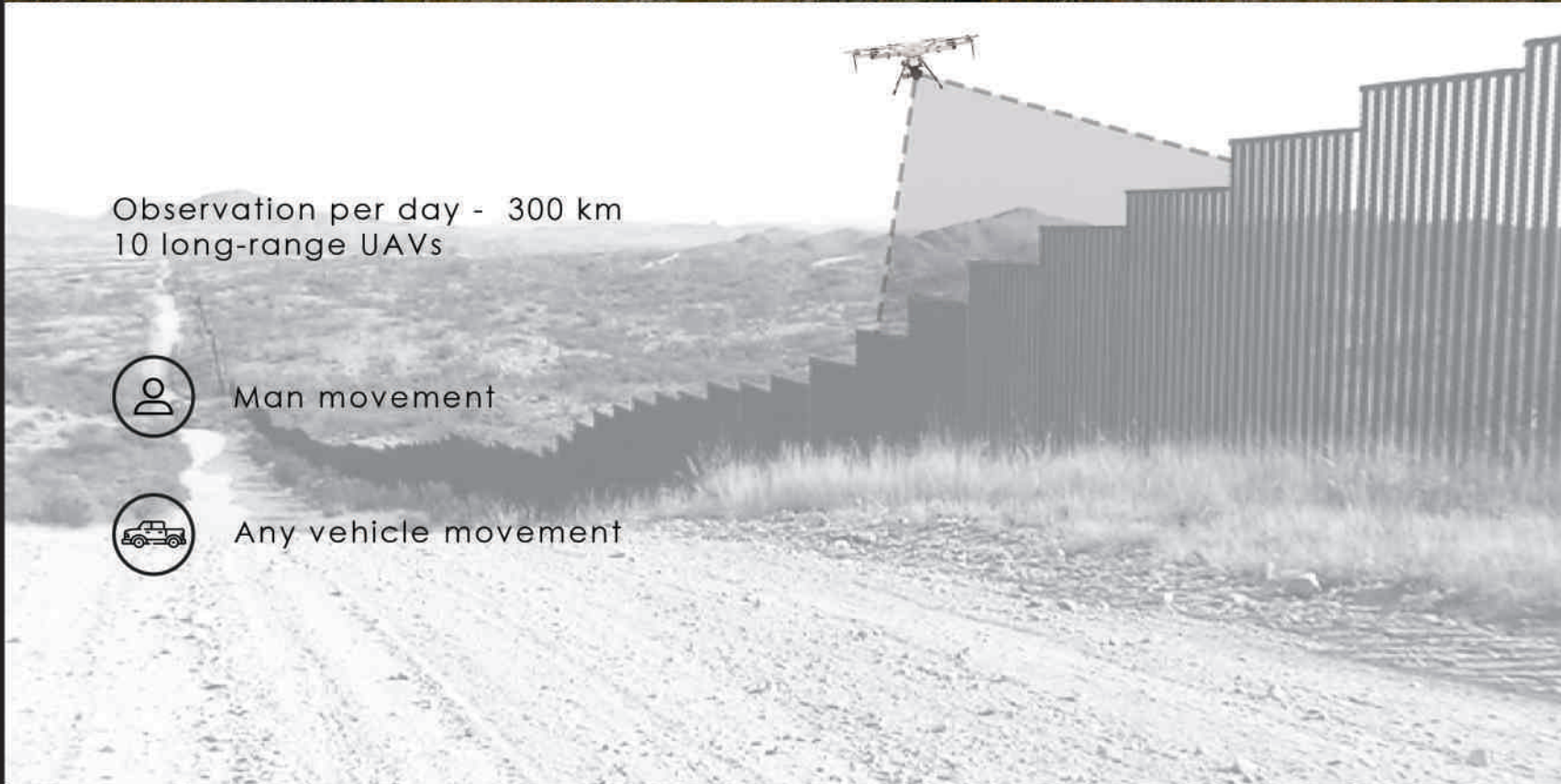
Gyro-stabilised multi-sensor gimbal, targets tracking system

Solution:

- 24/7 border patrol
- target identification and tracking



# BORDER CONTROL SURVEILLANCE



Observation per day - 300 km  
10 long-range UAVs



Man movement



Any vehicle movement



Recommended tools



- MagPike (based on MFAM)
- Thermal Cameras
- Video Gimbal
- GPR (Ground Penetration Radar)



# SOPHISTICATED UNMANNED AERIAL SOLUTION FOR DEMINING OPERATIONS

## Cicada-M (Long-range Hybrid UAS)

- Infra-red search for non-metallic cluster munitions, magnetometer for UXO detection.
- Non-technical and technical survey support.
- Confirmation of explosive hazard (EH) territory contamination
- Establishing target patterns and direction and investigating ground signs on operational sites.
- Observation in restricted access areas.
- Reconnaissance prior to entering previous work sites after a security incident.
- Area reduction and perimeter markings.
- Using drones pictures for operations planning.
- Visual inspection and post-data collection after demining operations.

## Cobra (Tethered Drone System)

- Useful for keeping track of where teams are on large multi team sites.
- Good for QA of teams as they work with good optics on the drone.
- Good for planning, able to see all terrain in a multi team area.
- Good if there is an accident, for guiding medics to the area.
- Provision of communications for ground-based robotic troops
- Protective security detail surveillance (e.g., vehicle breakdowns in hostile areas).
- Video monitoring and demining operation coordination (EYE IN THE SKY).



# TECHNICAL SPECIFICATIONS

## CICADA

### Weight and dimensions:

- Airframe diagonal - 1450 mm
- MTOW..... 19 kg
- Payload.....up to 2.5 kg



### Ranges:

- HD real-time video transmission...up to 15 km
- Direct control mode .....up to 15 km
- Automatic flight mode.....radius up to 25 km
- Max flight distance.....50 - 60 km (depending on speed)

### Flight speed:

- Cruise...40 km/h
- Maximum ...55 km/h
- Operating ceiling ..up to 800 m
- Flight time(depending on payload)..up to 2.5 h
- Fuel....95 Octane, oil mix
- Control system ...automatic
- Unpack to launch time...20 min

Compact

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Long-range

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Efficient

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Long-endurance



# TECHNICAL SPECIFICATIONS

## COBRA

### Weight and dimensions:

- Airframe diagonal - 1450 mm
- MTOW..... 15 kg
- Payload.....up to 3 kg on 100 m,  
up to 5 kg on 50 m.



### Operation condition:

- Maximum height...up to 100 m
- Operation in average wind .....36 km/h
- Operation in gusts of wind..... 43 km/h
- Enclosure rating.....IP 43

### Other:

- Max. inclination angle of the drone...30 deg
- Max. climbing speed ..1.5 m/s
- GNSS, GPS, Glonass, Beidou
- Max. flight time(depending on payload)..up to 12 h
- Energy backup battery....250 Wh
- Maximum motor output power motor ...1400 W
- Maximum possible ESC voltage...50 V

Compact

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Long-range

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Efficient

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Long-endurance



# IMPORTANT FEATURES

## COBRA



- Permanent operation up to 7 days
- Long-endurance performance
- Applications as a mobile tower (with a height of 100 m)

## CICADA



- Capability to perform on land and coastline
- Opportunities to take off from different surfaces
- Long-range mission and monitoring operation

Reliability

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Affordability

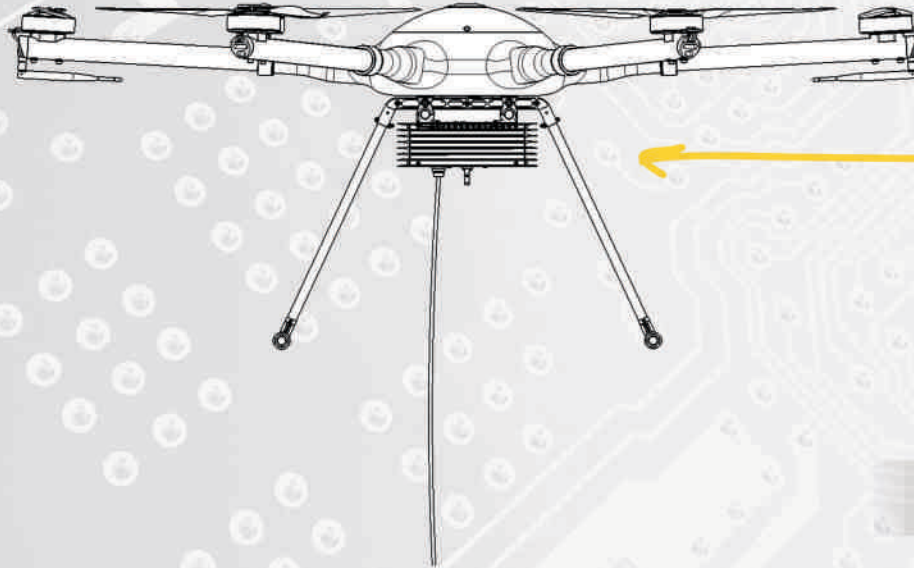
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Resilience



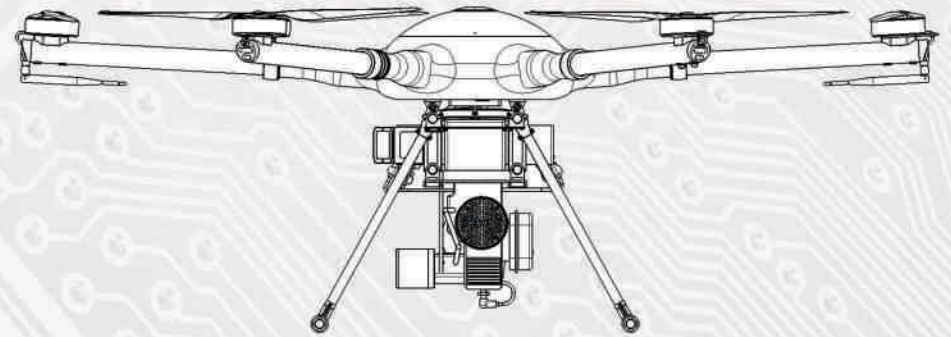
# APPARATUS DESIGN

COBRA



POWERLINE  
BOX

CICADA



HYBRID  
POWER  
UNIT

Reliability

Universal  
construction  
design of airframe

Resilience



# RELIABLE AND USER FRIENDLY



Reliability

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Affordability

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Mobility and transportation



• Easy transportation



• The UAS is packed in ...3-4 boxes



• Aeroplane empty weight ... 14 kg



• Reliable system



# INTERACTION SIMPLICITY



- Easy assembly



- 20 min deployment time



- Available user guide



- Smart training (1 month)



- Simple operating

Operating

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Maintenance

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Education

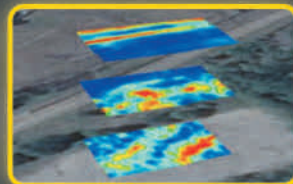
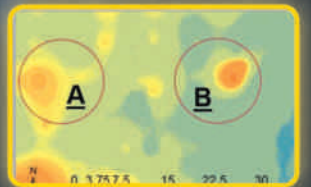
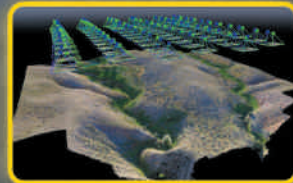


# CUSTOMIZED PAYLOAD

Various payloads  
and customization

Cicada  
Up to 3 kg  
(Cobra on 50 m  
up to 5 kg)

Cargo Chamber  
Option is available





# MOBILE GROUND STATIONS CUSTOMIZE FOR EVERY CLIENT'S CHALLENGES

Failsafe  
system

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All-terrain  
launch



•6 hours battery endurance

•2-3-4 displays

•Direct operation range up to 15 km

•HD live stream video up to 15 km



# DATA LINKS



High performance



Customised frequencies



Data control tracking



AES-256 encryption video link



AES-128 encryption data/telemetry link

High performance

Customised frequencies



# BENEFITS OF THE UNMANNED AERIAL SYSTEM WITH MOUNTED/EXTERNAL PAYLOADS



Cost-effective endurance operations with external payloads

In collaboration with Binghamton University (USA), long-range unmanned platform Cicada-M with magnetometric equipment was developed and integrated.

The data obtained show the prospect of aerial magnetometric intelligence and provide the basis for the further development of remote munitions retrieval systems and will be relevant in post-conflict territories.

- UXO/EOD/ERW and landmines detection
- Search for underground metal communications
- Minerals exploration that have a magnetic anomaly
- Identify positions of abandoned wells and boreholes

A Ground Penetrating Radar (GPR) mounted on a drone enables to see through the surface of ground, ice, rocks, freshwater, and buildings or through structures at unsafe and hazardous environments without compromising the safety of staff, providing an additional solution for more efficient surveying.

Current the GPR-drone integrated system can be used in areas where deep ground penetration is required but a good resolution is not very important.

Examples of applications include:

- Bathymetry of fresh water
- Geological surveys for soil layer profiling
- Mapping of underground infrastructure



# ECONOMY

Low cost  
per flying hour

High  
maintainability

Long lifespan

Low cost  
per mission

Low fuel  
consumption

200-300%  
lower  
expenses on  
aeromagnetic  
mission

Simply  
assembling

Only 2 people  
are required  
to operate the  
UAS

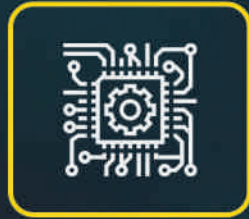
Easily  
maintainable

Protected  
Payload

Outstanding  
technical  
characteristics



# AUTONOMOUS



Robotised system



Autonomous flight missions up to 60 km



Safe flight and recovery



Elimination of human error

Robotised systems

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Autonomous flight missions





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10.00 – 18.00