# Description of Wavesonic Anti-drone System

# XXX Anti-drone Project

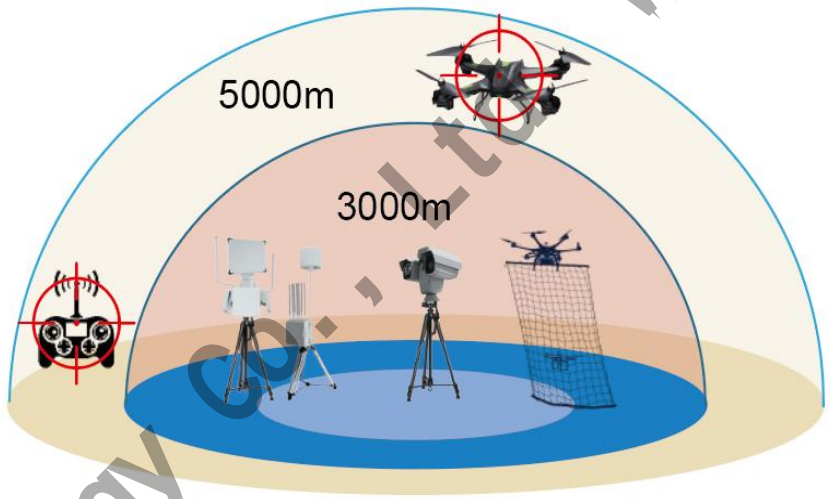
XXX is located by the sea and is surrounded by the sea on three sides. After measuring the requested 3 locations' security area on the map, we have plan to deploy for **3 alarm zone areas** with alarm zone areas as **5 km and 3km radius accordingly**.

For each alarm zone area, we will install anti-drone system on the roof of the building. The systems will include the following components:

1. **Surveillance Radars**
1.1 ASR 216SR-5K (with a coverage radius of **5km**)
1.2 ASR 216SR-10K (with a coverage radius of **10km**)
1.3 ASR 216X-3K (with a coverage radius of **3km**)

2. **RF Detection System**
2.1 DF-5000A (with a coverage radius of **5km**)
2.2 HD-5000R (with a coverage radius of **5km**)

3. **GPS Spoofing System** (with a coverage radius of **2km**)
4. **RF Jamming System** (with a coverage radius of **2-5km**)
5. **E/O Surveillance System** (with a coverage radius of **2-5km**)
6. **Drone Capture System** (with a coverage radius of **5km**)




# Fixed Version Anti-Drone System

RF Detector

Air Surveillance Radar

E/O Surveillance System

Hostile UAV

Control Software

360° RF Jamming System

GPS Spoofing System

# Portable Version Anti-Drone System

RF Detector

Jammer Gun

Hostile UAV

Control Software

Backpack Dribe Jammer

GPS Spoofing System

# Vehicle Mounted Version Anti-Drone System

RF Detector

E/O Surveillance System

Hostile UAV

Control Software

Air Surveillance Radar

360° RF Jamming System

GPS Spoofing System

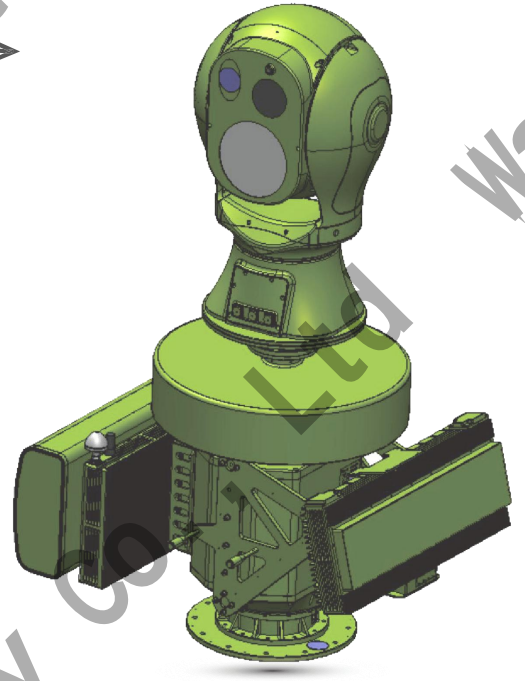
# Vehicle Mounted Version Anti-Drone System

Hostile UAV

Control Software

RF Detector

E/O Surveillance System



Air Surveillance Radar

Directional RF Jamming System

GPS Spoofing System

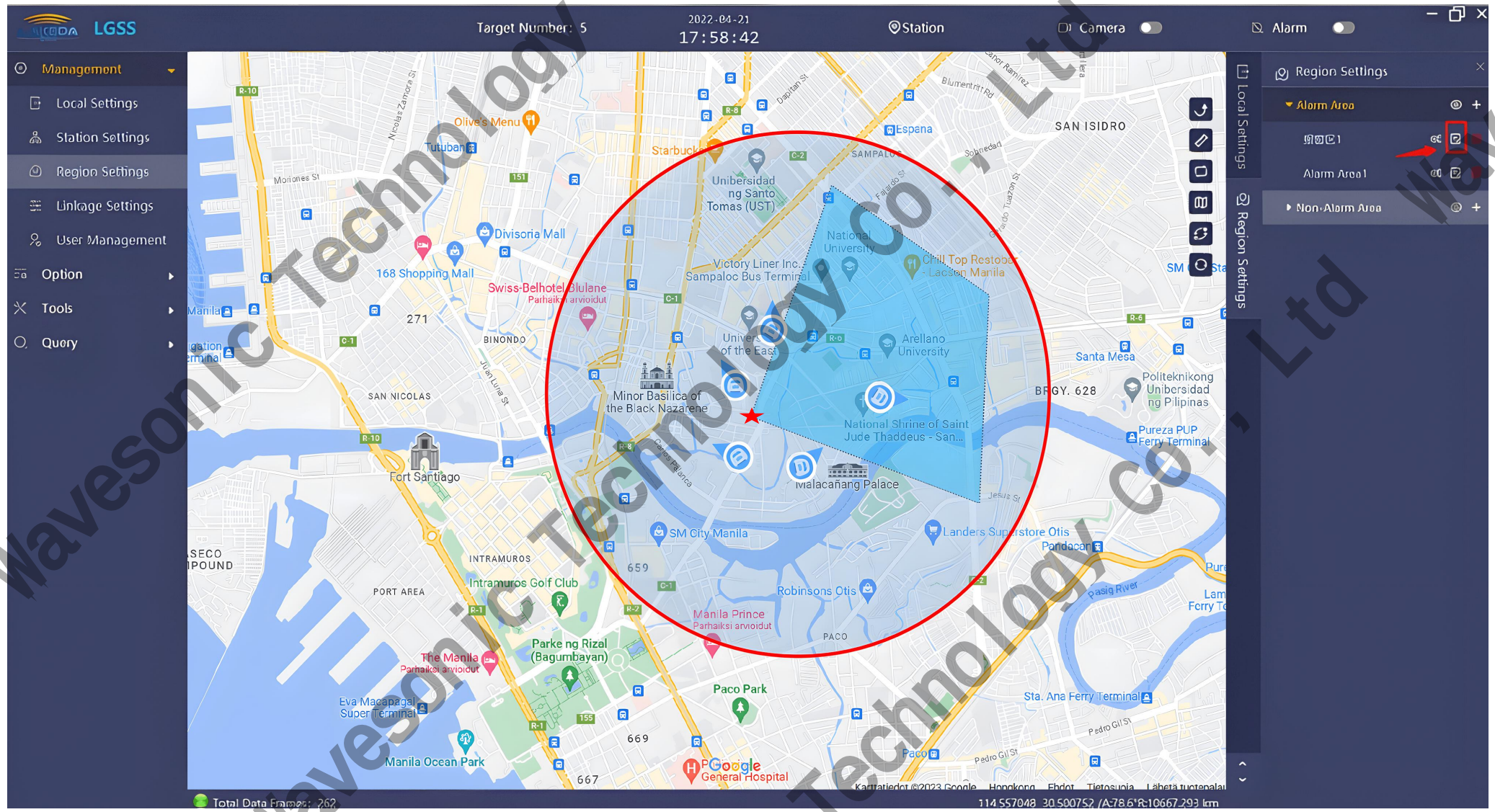
# UAV Control Center

# Anti-drone Control Software

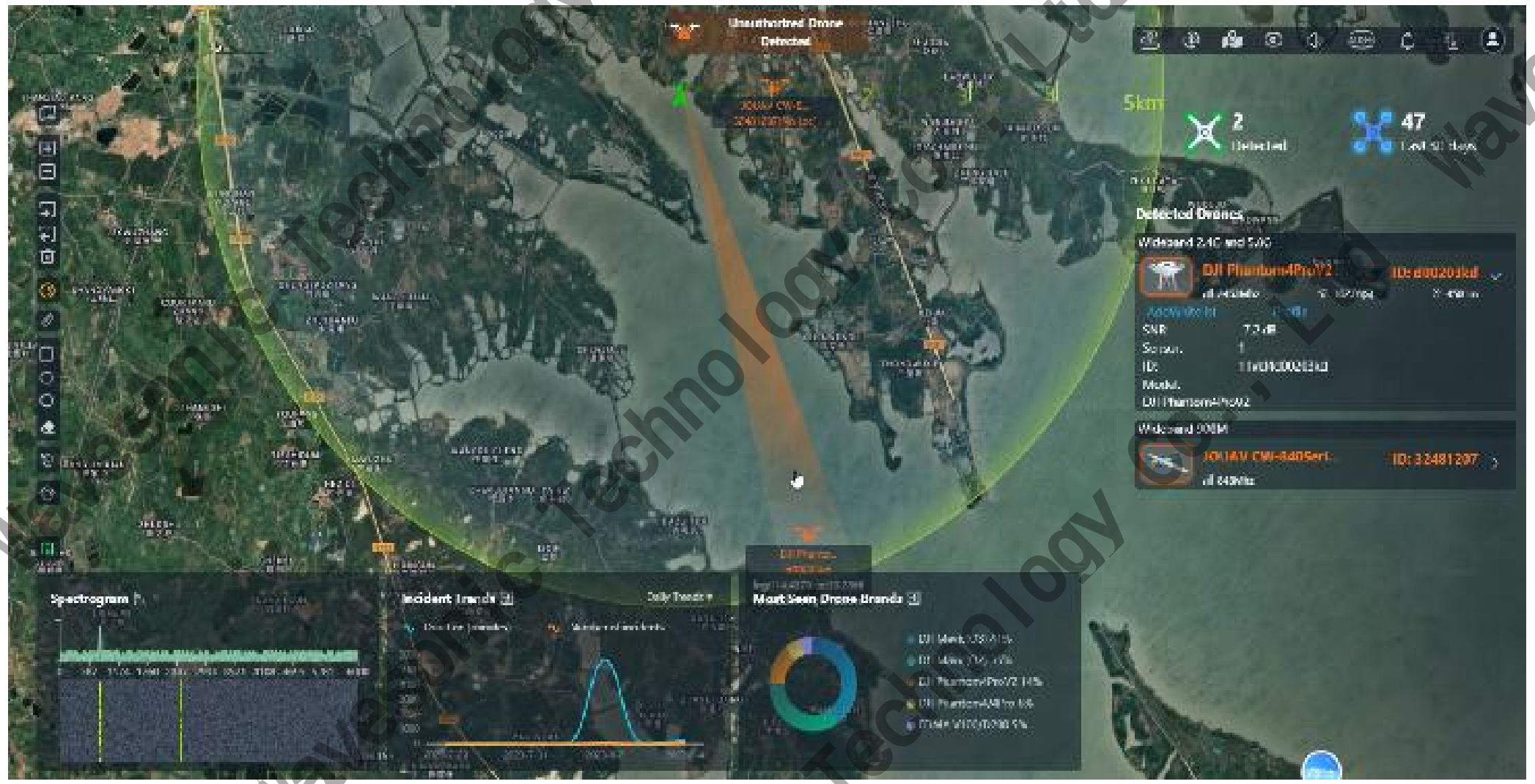
- 1. Real-time spectrum monitoring;
- 2. Alarm Zone custom;
- 3. Rapid Alarm for Abnormal Targets;
- 4. Identification of invasive models;
- 5. Drone trajectory tracking;
- 6. Reminder for Abnormal Equipment;
- 7. A central system displays monitoring information from all sub-sites;
- 8. Integrate all sub-systems into one monitoring software;

# Drone trajectory tracking

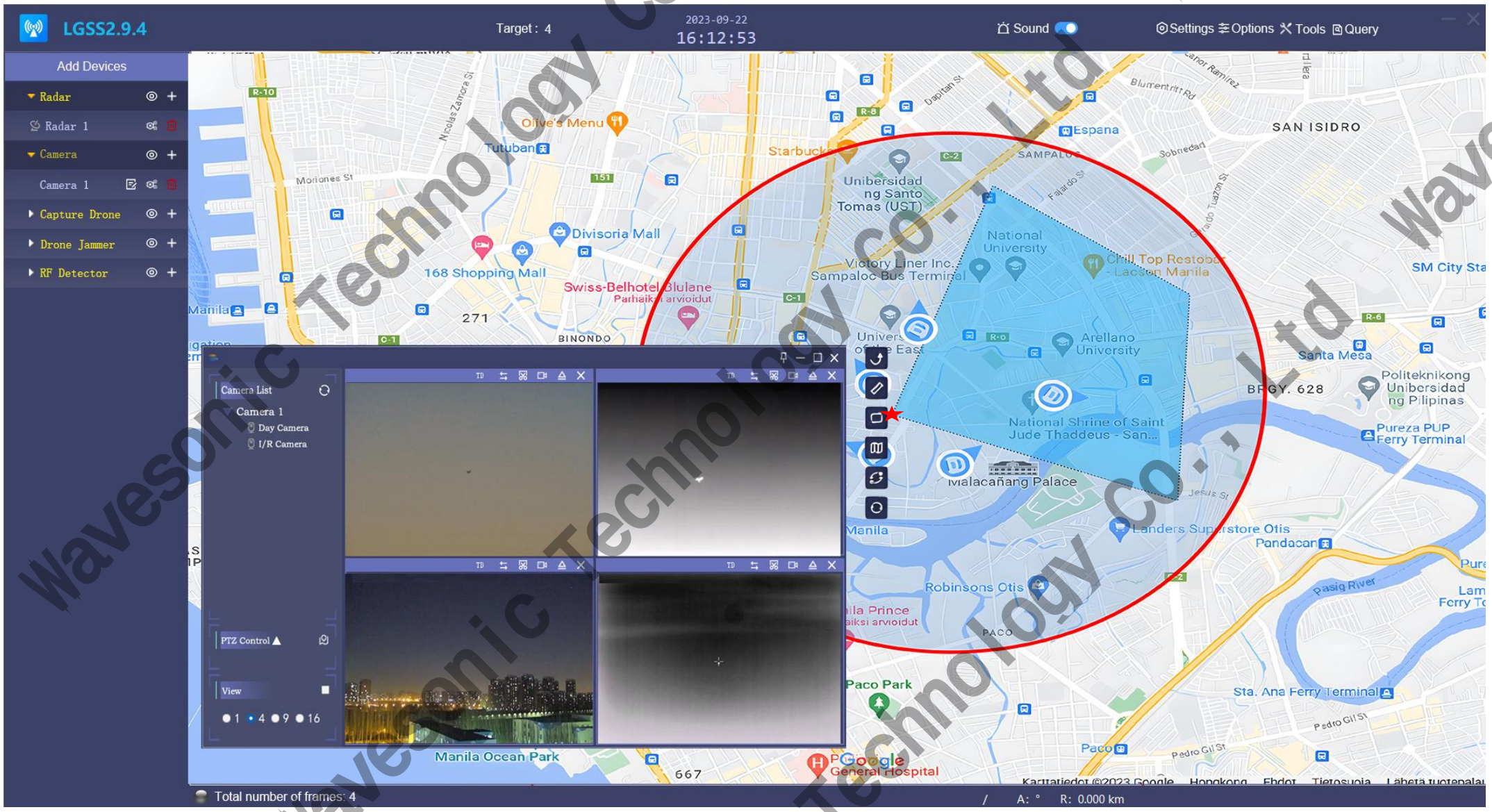
# Set Up Alarm Zone



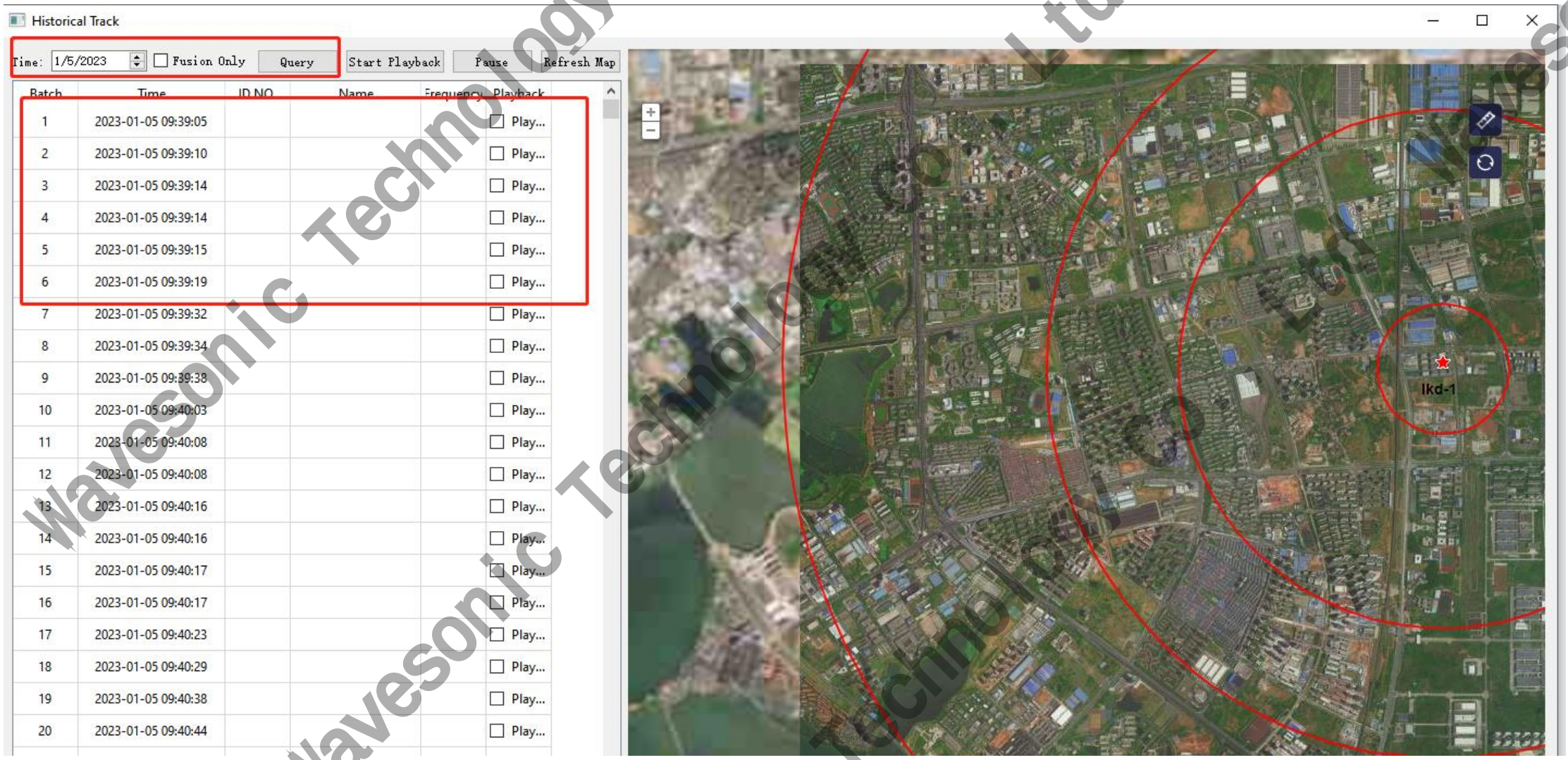
Identification of invasive brands,models,frequencies,location of operators, etc information



# Camera Surveillance System



# Surveillance History playback



# Wavesonic Anti-Drone System Workflow

## 1. Surveillance Phase:

- The system initiates with radar and RF detection, covering a 5-10km radius, monitoring the airspace.

- Suspicious drone activity within the designated alert zones triggers automatic alerts at the control center.

- Detailed information about the suspicious drone, including flight trajectory, model, frequency, electronic fingerprint, azimuth, speed, altitude, and drone operator location, is displayed on the control center's monitoring screen.

- Simultaneously, the system transmits the drone operator's location information via ISM signals to the personnel, facilitating operator apprehension.

## 2. Intrusion Phase:

- When a suspicious drone enters the controlled area, the system activates the corresponding interference system, disrupting the drone's GNSS and control signals.

- Meanwhile, a capture drone is deployed, taking off automatically. The control software provides the coordinates of the suspicious drone. (Optional)

- Capture drone flies to the suspicious drone, initiating real-time video capture for confirmation.(Optional)

### 3. Capture Phase:

- The capture drone operates on a different frequency range than the RF jammer system, ensuring it is unaffected by control signal interference.

- As the suspicious drone enters a 2km range, the EO/IR system locks onto and tracks it for evidence gathering.

- The system activates the GPS spoofing system to take control of the drone's navigation signals, coaxing it to descend to a specified location.

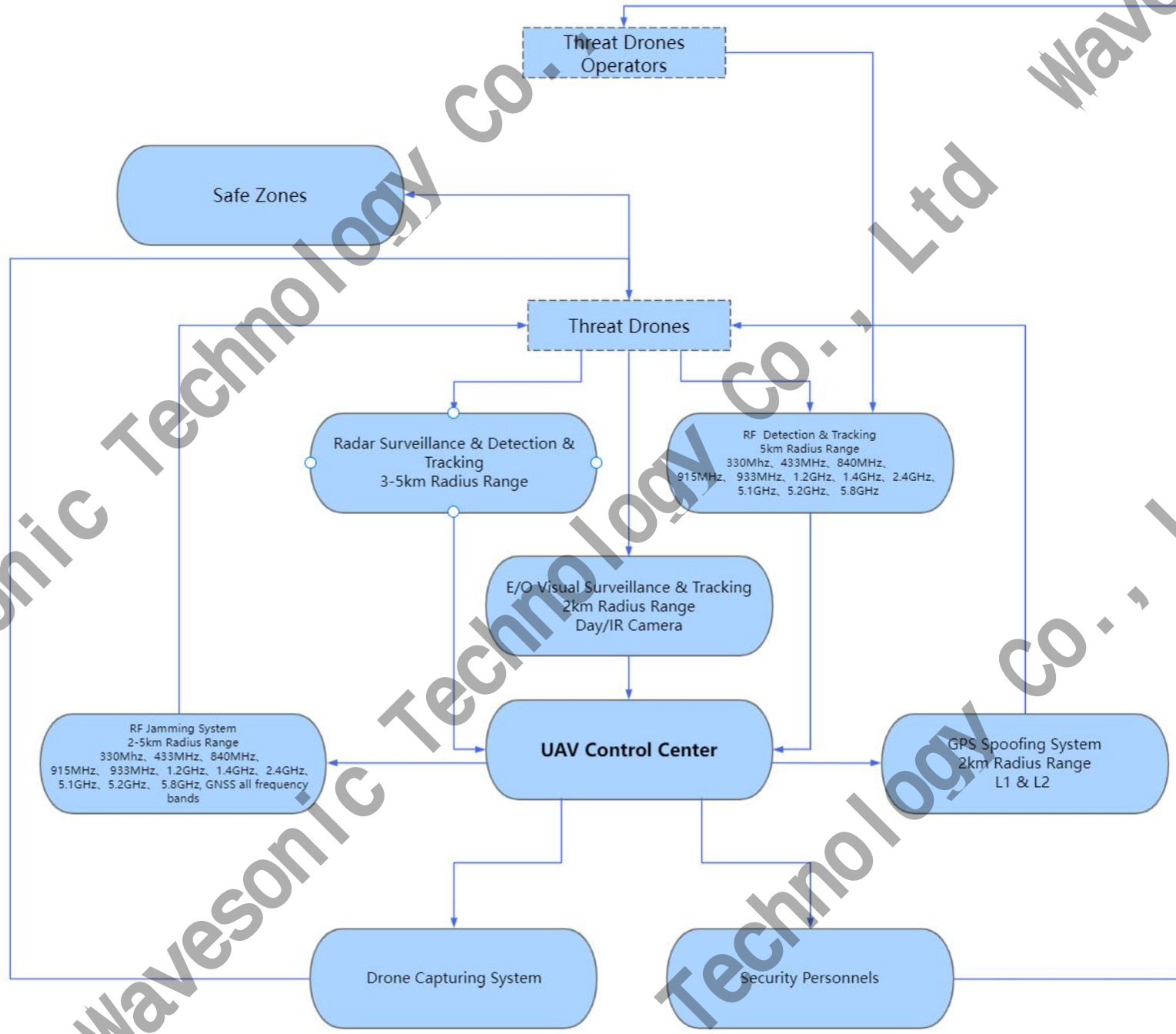
### 4. Contingency Phase:

- If the RF jammer and GPS spoofing systems fail to effectively disrupt and coax the drone, the capture drone employs a capture net mid-air to apprehend the target.

- After completing the mission, the capture drone returns to its designated point.

5. Documentation and Logging:

- Throughout the operation, the system maintains a comprehensive log, storing historical records for subsequent review and evidence preservation.


Threat Drones Operators
Safe Zones
Threat Drones
Radar Surveillance & Detection & Tracking
3-5km Radius Range
RF Detection & Tracking
5km Radius Range
330Mhz、433MHz、840MHz、915MHz、933MHz、1.2GHz、1.4GHz、2.4GHz、5.1GHz、5.2GHz、5.8GHz
E/O Visual Surveillance & Tracking
2km Radius Range
Day/IR Camera
RF Jamming System
2-5km Radius Range
330Mhz、433MHz、840MHz、915MHz、933MHz、1.2GHz、1.4GHz、2.4GHz、5.1GHz、5.2GHz、5.8GHz, GNSS all frequency bands
UAV Control Center
GPS Spoofing System
2km Radius Range
L1 & L2
Drone Capturing System
Security Personnels

# Area 1: Anti-drone Solution Setup

1. Install one 3km-5km radius surveillance radar;
2. Install one 5km radius Drone RF detection system;
3. Install one 3-5km radius drone RF Jamming system;
4. Install one 2km radius drone GPS spoofing system;
5. Install one 2km radius E/O surveillance camera system;
6. Install one 5km radius drone capture system;
7. Install one UAV Control Software as the three locations' command center;

# X-band Phased Array Radar (3km Radius)

ASR 216X-1X3K-3D

- X band 3D coordinates phased array radar;
- Effective detection distance up to 3km radius;
- Easy to depolyment;
- High data rate and high positioning accuracy;
- Multi-Input Multi-Output (MIMO) system;
- All-weather adaptability;

# S-band Phased Array Radar (5km Radius)

ASR 216SR-1S5K-3D

- S band 3D coordinates phased array radar;
- Effective detection distance up to 5km radius;
- Easy to depolyment;
- High data rate and high positioning accuracy;
- Multi-Input Multi-Output (MIMO) system;
- All-weather adaptability;

# S-band Phased Array Radar (10km Radius)

ASR 216SR-1S10K-3D

- S band 3D coordinates phased array radar;
- Effective detection distance up to 10km radius;
- Easy to depolyment;
- High data rate and high positioning accuracy;
- Multi-Input Multi-Output (MIMO) system;
- All-weather adaptability;

# Drone RF Detection System (5km Radius)

DF-5000A

- Passive detection: Receives signals without emitting any electromagnetic signals, detecting UAV model and electronic fingerprint.
- Accurate orientation: Precisely determines UAV direction and indicates the target.
- Accurate identification: Can differentiate between drones of the same brand and model, automatically activating the jamming system to counter detected frequencies.
- Extensive model library: Supports DJI, mainstream brands, and DIY drones, covering over 98% of market models.
- Operator location tracking: Capable of pinpointing the UAV operator's location and sending SMS alerts to law enforcement.

# Drone RF Detection System (3-5km Radius)

WS-HD-5000R

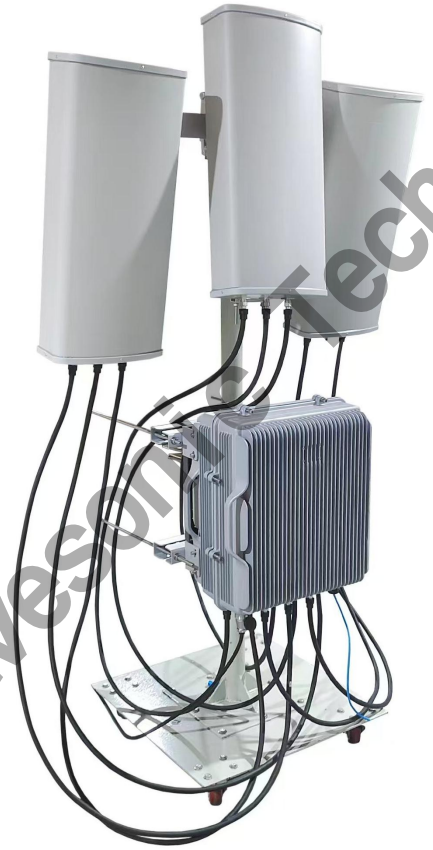
- Passive detection: Receives signals without emitting any electromagnetic signals, detecting UAV model and electronic fingerprint.
- Accurate orientation: Precisely determines UAV direction and indicates the target.
- Accurate identification: Can differentiate between drones of the same brand and model, automatically activating the jamming system to counter detected frequencies.
- Extensive model library: Supports DJI, mainstream brands, and DIY drones, covering over 98% of market models.
- Operator location tracking: Capable of pinpointing the UAV operator's location and sending SMS alerts to law enforcement.

# 360° Drone RF Jamming System (5km Radius)

WS-ODNF5000-B

- Based on the principles of radio interference and blocking technology, precision directional mitigation can effectively disrupt the communication commands of UAVs, ensuring safety at low altitudes within the control area.
- Drone mitigation distance can extend up to 5 kilometers(GPS).
- Provides 360° coverage with 4 sets of directional antennas.
- Automatically activating the jamming system to counter detected frequencies.

# 360° Drone RF Jamming System (3-5km Radius)



WS-DNF3000-B

- Based on the principles of radio interference and blocking technology, precision directional mitigation can effectively disrupt the communication commands of UAVs, ensuring safety at low altitudes within the control area.
- Drone mitigation distance can extend up to 5 kilometers(GPS).
- Provides 360° coverage with 4 sets of directional antennas.
- Automatically activating the jamming system to counter detected frequencies.

# Drone Jammer Gun (2-3km)

- Light Weight;
- Handheld cUAS effector;
- Rapid response countermeasure capability;
- Highly effective against a wide range of drones;
- Force drones landing on the spot or return back;

# Drone GPS Spoofing System (2km Radius)

WS-SF201C

- Decoy and forced drone landing
- Working on L1 and L2 of GPS
- Up to 2km radius working range;

# Drone E/O Surveillance System (2km Radius)

WSDG1.0-OF1K

- Day & IR Cameras
- Surveillance Range: 2km
- Visual Threat Confirmation

# Drone E/O Surveillance System (3-5km Radius)

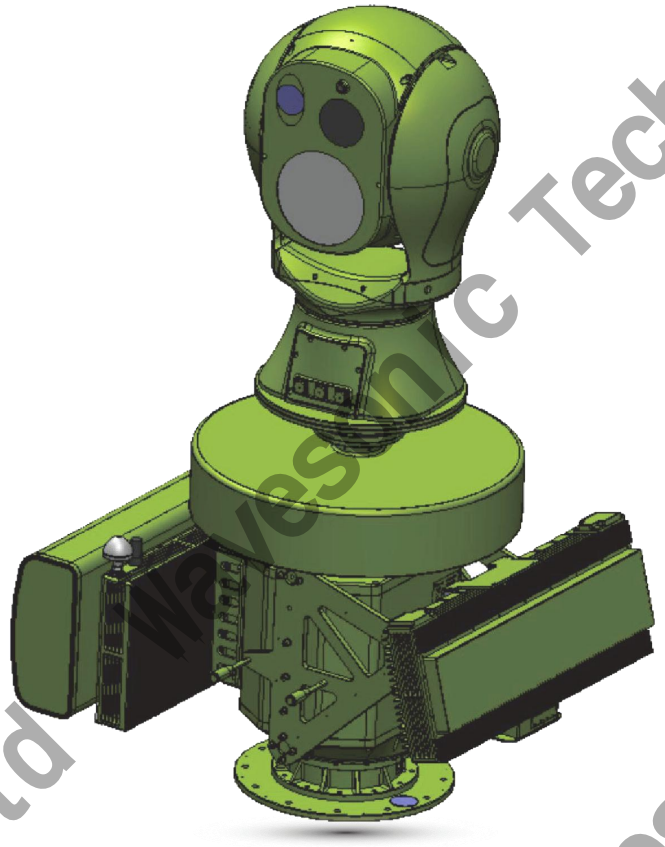
WSDG1.0-OF3K

- Day & IR Cameras
- Surveillance Range: 3-5km
- Visual Threat Confirmation

# Vehicle Mounted Anti-Drone System

- Radar Detection System (1.5km)
- GPS Spoofing System (2km)
- RF Detection System (5km)
- Directional Jammer System (2km)

# Vehicle Mounted Anti-Drone System



- Radar Detection System (5km)
- RF Detection System (5km)
- GPS Spoofing System (2km)
- Directional Jammer System (5km)

# Anti-drone Control Software

- 1. Real-time spectrum monitoring;
- 2. Alarm Zone custom;
- 3. Rapid Alarm for Abnormal Targets;
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# Thanks for Your Time