

SkyShield C-UAS: Protecting Critical Infrastructure with Advanced Drone Detection and Mitigation



The rapid rise of drone technologies has introduced unprecedented risks to critical infrastructure, including power grids, transportation hubs, oil and gas facilities, prisons, and more. LOCH's SkyShield Counter-Unmanned Aircraft System (C-UAS) provides cutting-edge protection against drone threats, addressing the unique vulnerabilities of these vital assets. Below, we explore impactful use cases demonstrating how SkyShield safeguards critical infrastructure.

Wireless Risks and Threats from RF Drones

1 Surveillance and Reconnaissance:

Scenario: A drone equipped with Wi-Fi or cellular connectivity surveys a power plant, mapping out critical systems and access points.

Impact: Adversaries gain intelligence that can be used for sabotage or cyberattacks.

SkyShield's Role: Identifies and flags surveillance drones in real-time, enabling security teams to neutralize threats and protect sensitive assets.

2 Electronic Warfare and Signal Interference:

Scenario: A drone disrupts GPS signals at a major transportation hub, delaying operations and causing chaos.

Impact: Communication and navigation failures result in operational downtime and increased security risks.

SkyShield's Role: Detects RF jamming and spoofing activities, alerting operators and enabling countermeasures to restore functionality.

3 Direct Attack Capabilities:

Scenario: A weaponized drone targets an oil refinery, using cellular control to bypass perimeter defenses.

Impact: Physical damage to infrastructure, environmental hazards, and operational shutdowns.

SkyShield's Role: Provides early detection of hostile drones, enabling swift deployment of mitigation measures to prevent attacks.

4 Data Breach and Cybersecurity Risks:

Scenario: RF hacking drones intercept wireless communications at a data center, compromising sensitive information.

Impact: Data breaches lead to financial losses, regulatory penalties, and reputational damage.

SkyShield's Role: Monitors wireless activity to detect unauthorized interception attempts, ensuring secure communications.

5 Contraband Smuggling into Prisons:

Scenario: A drone is used to deliver contraband, such as weapons or drugs, over prison walls undetected.

Impact: Smuggled contraband compromises safety within the prison, endangering staff and inmates.

SkyShield's Role: Detects and alerts authorities to unauthorized drone activity, enabling interception before delivery.



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#include <iostream
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std::cout << "Hel
return 0;

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Key Impacts on Critical Infrastructure

01. Compromised Operational Security:

Challenge:

Unauthorized surveillance exposes vulnerabilities and facilitates attacks.

Solution:

SkyShield's real-time monitoring preserves the integrity of critical operations.



02. Disrupted Operations:

Challenge:

RF interference disrupts essential communication and navigation systems.

Solution:

SkyShield's proactive detection of signal interference ensures uninterrupted operations.



03. Increased Vulnerability to Attacks:

Challenge:

Weaponized drones pose significant threats to infrastructure and personnel.

Solution:

SkyShield's rapid response minimizes risks and neutralizes threats.



04. Financial and Reputational Impact:

Challenge:

Drone-related incidents lead to costly downtime and damage to public trust.

Solution:

SkyShield's advanced capabilities protect infrastructure, preventing financial and reputational losses.



05. Compromised Prison Security:

Challenge:

Contraband deliveries enable criminal activities and increase prison violence.

Solution:

SkyShield's detection and mitigation capabilities maintain prison safety and security.



SkyShield's Advanced Features: Real-World Use Cases



Real-Time Drone Detection and Identification:

Use Case: At a power grid facility, SkyShield identifies multiple drones in the vicinity, providing immediate situational awareness to security personnel.



Advanced Signal Analysis and Classification:

Use Case: SkyShield differentiates between harmless drones and potential threats at a shipping port, streamlining resource allocation for response teams.



Automated Alerts and Response Integration:

Use Case: Integrated with an RF jammer, SkyShield neutralizes a drone attempting to disrupt operations at a financial data center.



Wide Area Coverage and Scalability:

Use Case: Deployed across an airport, SkyShield's scalable network ensures comprehensive protection of runways, terminals, and cargo areas.



Minimal Footprint and Easy Deployment:

Use Case: A portable SkyShield system is quickly set up to secure a temporary construction site at a critical energy project.



Enhanced Situational Awareness:

Use Case: During a high-profile public event, SkyShield provides real-time monitoring of drone activities, enabling proactive threat management and ensuring public safety.



Preventing Contraband Smuggling:

Use Case: At a high-security prison, SkyShield detects and tracks a drone attempting to drop contraband, allowing security personnel to intercept the drone and prevent delivery.

Why SkyShield Matters for Critical Infrastructure

LOCH's SkyShield C-UAS solution delivers comprehensive protection for vital facilities, ensuring:



Operational Continuity:

By countering surveillance, jamming, and weaponized drone threats.



Infrastructure Security:

Minimizing physical and cyber risks to critical systems.



Public Trust:

Safeguarding essential services and preventing reputational damage.



Prison Security:

Preventing contraband smuggling and maintaining safety within correctional facilities.

SkyShield isn't just a defense system; it's a vital tool for ensuring the safety and resilience of critical infrastructure in an era of evolving drone threats.

SkyShield Solution



Up to 6 Miles detection distance :

SkyShield detected drones from 6-mile distance with solid direction tracking.



100% Detection coverage:

SkyShield detected 100% of the DRONES, including commercial off-the-shelf (COTS) and Do-It-Yourself(DIY)/Hobbyist quadcopters and fixed-wing drones.



Selective Jamming:

Selective jamming (a.k.a smart defense) jams a specific drone target without disrupting other DRONES within WI-FI, Bluetooth or other RF frequencies within the same band (2.4GHz and 5.8GHz bands).



100% Defeat coverage:

SkyShield defended/jammed 100% of the tested drones, including the DJI Mavic drone, which we know is difficult to defeat using jammers.



Drone swarm detection and multi-object tracking:

SkyShield detected 14 out of 14 different DRONE types flown at the same time from various distances and locations, with accurate direction finding (DF).

SkyShield DRONE Detection Capabilities



Detection Range
up to 6 Miles



Most Extensive
DRONE library



Near zero
false alarms



Signal
Emission



Airspace detection
360 degrees



Simultaneous DRONE
detection loads



6 Mile Detection Coverage from a Single Sensor



Detected protocol and/or More information

Friend/Foe indicator

Common device names associated with the detected protocol

Direction finding result

Visual verification

Detection

Detectors	Friend List	Ignore List
<p>No-IP</p> <p> Possible Drone Signal - Telemetry</p> <ul style="list-style-type: none"> Direction: Unknown Detection Engine: AI Frequency: 868MHz Seen Times: 7 ID: 100021 Threat Probability: 97% <p>More Info</p>		Ignore
<p>03</p> <p> Mavic 3 / Mavic Air 2s (Wideband) - Drone</p> <ul style="list-style-type: none"> Direction: 180° Detection Engine: Library Frequency: 2.4GHz Seen Times: 10 Name: 000311 <p>Un-Friend</p>		Un-Friend
<p>02</p> <p> Mavic 3 / Mavic Air 2s - RC</p> <ul style="list-style-type: none"> Direction: 75° Detection Engine: Library Frequency: 5.9GHz Seen Times: 11 ID: 00000d <p>Friend</p>		Friend
<p>01</p> <p> Futaba-V2 - RC</p> <ul style="list-style-type: none"> Direction: 100° Detection Engine: Library Frequency: 2.4GHz Seen Times: 10 ID: 0e5642 <p>Friend</p>		Friend

Drill Down on 450+ DRONE Types

Detection

Detected protocol and/or More information

Click

Protocol Name: DJI Ocusync 3.0

This protocol is shared by the following drone models:

- Mavic Air 2s
- Mavic 3
- AVATA
- Mini 3 Pro
- M300-Drone

Track and Follow the DRONE Flight Path

Geo Location

DJI - Mavic 3 - Drone + RC

- Location: [49.2589,-122.6440]
- Drone Height [m]: 125.3
- RC Location: [49.2496,-122.6449]
- Home Location: [49.2496,-122.6449]
- Seen Times: 2
- ID: F457

Detected by: [49.2589,-122.6440] Direction: 175.6° Distance: 1338m

SkyShield Mobile Kit

Antenna(s) : 2.4G/5.2G/5.8GHz 900MHz;
868Mhz ; wifi ; GPS

Direction Finding (DF) antenna

Headphones

MOLLE attachment system

Rechargeable batteries

Battery charger

Antenna Kit

868 Mhz: 863 Mhz - 870 Mhz

915 MHz : 902 MHz - 928 MHz

2.4 GHz: 2400 MHz - 2500 MHz

5.2 GHz: 5150 MHz - 5250 MHz

5.8 GHz: 5725 MHz - 5850 MHz

Smart & Autonomous RF Drone Detection System

The Next-Generation
Counter-Drone
Technology

