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The Beginners Guide to Securing Sensitive Airspace With Anti-Drone Technology

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Introduction

Drones have changed the security game. Are you ready to play?
There are millions of civilian drones in circulation today and an estimated 7 million will take to the skies in the US alone by 2020(1). Both legislation and traditional security mechanisms have failed to keep up with these rapid changes, transforming lower level airspace (below 120m or 400ft) into a free-for-all and putting individuals and sensitive infrastructure at risk from badly piloted or malevolent drones.

Organizations as diverse as the Russian and Chinese militaries, the US Department of Homeland Security and the International Civil Aviation Organization are declaring drone detection and neutralization a top priority, indicating just how urgent it is for security administrators everywhere to take steps now to secure their airspace

In this publication you will learn:

- The technologies available for drone detection and neutralization

- The risks drones pose to your site

- How to assess your security needs and develop a security plan

- How to evaluate and choose a technology provider and anti-drone system

(1) "FAA Releases 2016 to 2036 Aerospace Forecast." FAA Seal, 24 Mar. 2016, www.faa.gov/news/updates/?newsId=85227&cid=TW414.4

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Chapter I –
Drone Detection &
Neutralization
Technologies

In this chapter you will learn:

- What technologies are available to detect drones
- What steps can be taken to neutralize intruding drones

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Chapter I – Drone Detection & Neutralization Technologies

With so many different anti-drone methods jostling for attention, understanding drone detection and neutralization can be an intimidating task. All the same, a handful of technologies have gradually risen above the rest and been adopted by the majority of security providers:

Drone Detection Technologies

Radiofrequency
RF technology analyses the RF spectrum within the protected area, searching for any form of communication between a drone and its remote-control. In some cases, RF can even identify the drone make and model, as well as the MAC address for WiFi drones.

Pros: Drone and pilot localization. Drone characterization. Passive technology. Multiple drone detection
Cons: Does not detect autonomous drones. Local RF pollution may reduce effectiveness

Optic (Cameras)
Optics allow visual detection and characterization of approaching drones and drone payloads. Like radar, optics can be successfully combined with RF technology to provide more thorough coverage.

Pros: Visuals can be retained and used for forensic evidence of drone intrusions. Passive technology. Few restrictions for use
Cons: Without RF or radar back-up false alarm rates are high. Performance impacted by light and weather conditions. Difficulties detecting small drones

Radar
Radar can provide effective detection of drone presence over a long range. It can be successfully paired with other technologies, such as RF or optic, to provide more thorough coverage if desired.

Pros: Long range. Constant coverage. Drone tracking. Multiple drone detection.
Cons: Can interfere with ambient communications. Can require authorizations from local authorities. Difficulties detecting small drones

Acoustic
Acoustic sensors recognize drone sounds from a database of drone acoustic signatures.

Pros: Can detect autonomous drones and provide azimuthal information on incoming drone direction
Cons: Sound database must be constantly updated to be effective. Drones are becoming more and more noiseless as technology advances. Difficulties tracking modified drones

Drone Neutralization Technologies

A follow-up to drone detection, countermeasures* may be active or passive depending on the severity and nature of the threat and the authorizations available to the security administrator:

Passive Countermeasures may include evacuation and retreat to a safe place, blocking access points such as windows, halting data transfers, confidential conversations or other sensitive operations, etc.

Active Countermeasures, such as jamming technology or net throwers, are typically reserved for Military or Police personnel only. It is important to consult regulatory legislation on the subject.

* The purchase or usage of jamming technologies only applies to public order, national defense and security needs or public law enforcement in accordance with local regulations

Chapter II – Drone Risks

In this chapter you will learn:

- What areas are threatened by drone intrusions
- What risks can drones pose

Chapter II – Drone Risks

Areas that were once off-limits due to their inaccessibility are now fair game thanks to the rise of drone technology. Is your airspace among those threatened by rogue drone intrusions? You may be surprised:

Public Places

Stadiums & Events
Attack - Collision - Contraband - Spying

Government Buildings
Attack - Collision - Spying

Parks
Attack - Collision - Spying

Security & Defense

Prisons
Attack - Contraband - Spying

Military Bases & Patrols
Attack - Collision - Spying

Police Patrols
Attack - Collision - Spying

Critical Infrastructure

Airports
Attack - Collision - Contraband - Spying

Oil Rigs & Pipelines
Attack - Collision - Spying

Power Plants
Attack - Collision - Spying

Personal

Villas
Attack - Collision - Spying

Resorts
Attack - Collision - Spying
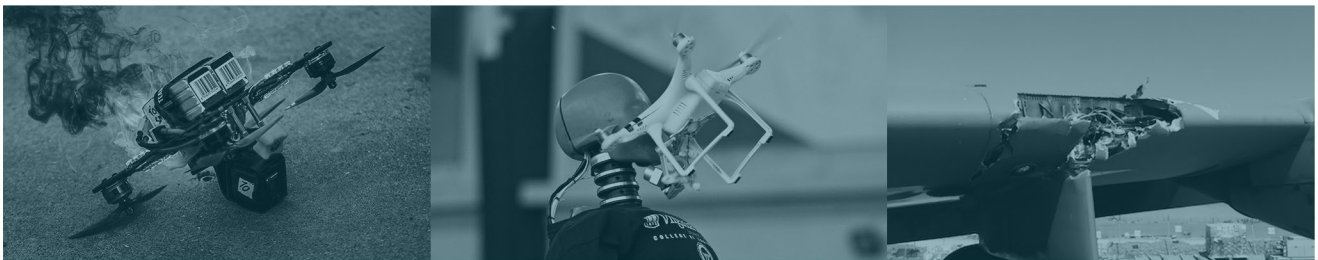

Yachts
Attack - Collision - Spying

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Threats in Detail

Attack
Drones are capable of transporting explosives or biological and chemical weapons that can cause serious harm and costly damage

Collision
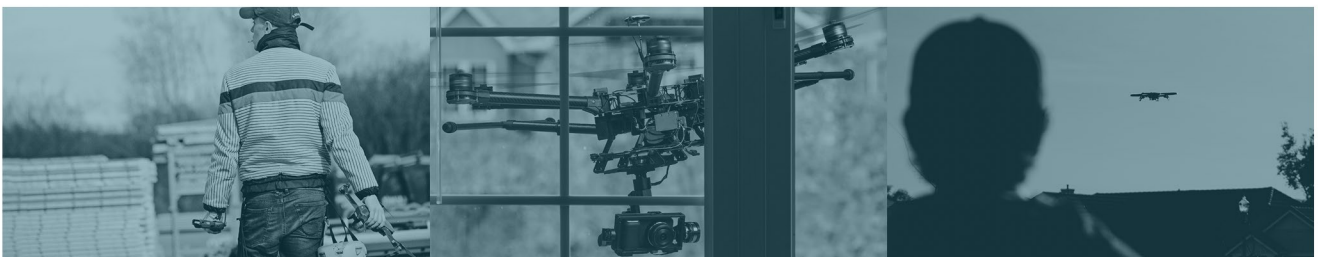A drone entering the flightpath of an aircraft can cause serious damage and puts lives at risk.
Individuals are vulnerable to falling drones - often due to bad piloting or a weak battery

Contraband
A drone smuggling drugs, weapons or other contraband can easily bypass ground-based security

Spying
With their powerful cameras, a drone can spy on unsuspecting individuals or sensitive sites

Chapter III – Prepare Your Airspace Defense

In this chapter you will learn:

- How to determine your airspace security needs
- How to develop an airspace security timeline

Chapter III –
Prepare Your Airspace Defense

Getting Started

Simply being aware of the threat is an excellent first step. But, how can you construct and implement a truly efficient anti-drone system to protect your airspace? To get a clearer picture, consider the points below:

What are your security needs?
Identifying your security needs is critical to constructing an effective airspace security plan:

☐ Protection from corporate espionage or indiscreet photos or videos?

☐ Shield your personnel or equipment from physical attacks?

☐ Halt cyberattacks on critical IT systems?

☐ Put a stop to clandestine contraband deliveries?

☐ Other

What security do you already have in place?

☐ Do you have a current security system already installed at your site?

☐ Is it possible to upgrade it with add-ons or do you need to start from scratch?

☐ What security personnel, if any, will need to be trained on any new technology?

What is your site layout?
With your security needs in mind, take a careful look at the layout of your facilities to determine areas that may need to be reinforced:

☐ Close to other sensitive areas like military bases or airports?

☐ In a dense urban area or open field?

☐ Is there likely to be a large amount of radiofrequency or radar interference in the environment?

☐ How large is the site to be protected?

☐ Does your site present specific vulnerabilities like bay windows or open spaces?

Who is in your sky?

☐ Are there already other drones or aircraft in your employ?

If so, it's important to be able to distinguish between "friendly" airborne objects and those which may pose a threat to your security.

What is your threat level?
Even if your site is at seemingly low risk from drone intrusions, proper surveillance of your airspace may reveal surprises:

☐ Have you already spotted intruding drones in your airspace?

☐ Is your facility vulnerable from attacks from the air?

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What is your budget?
Don't believe that anti-drone systems are only within reach of organizations or individuals with deep pockets.
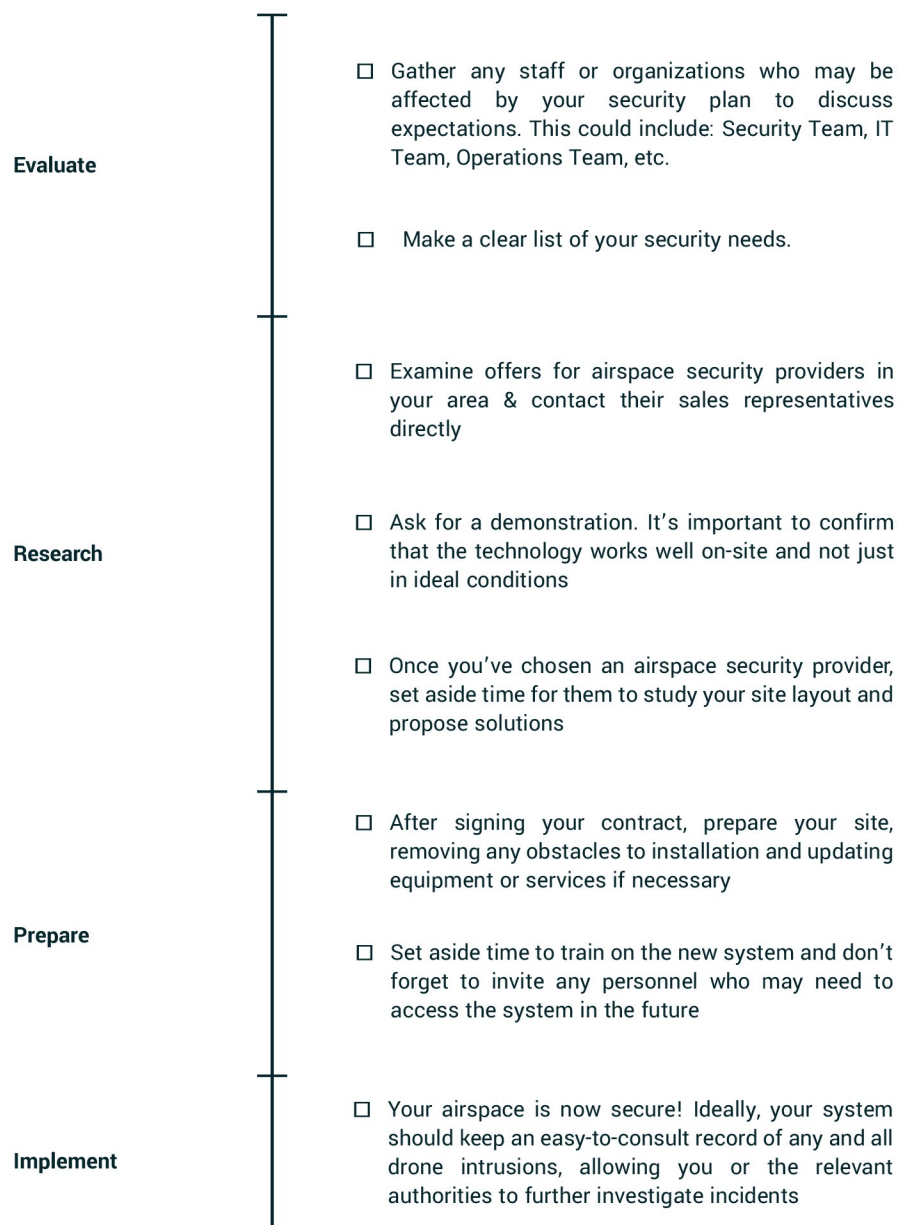
Begin by determining how large of a budget you can allocate to security. You should take hardware, software, installation and maintenance costs into consideration as well as training and personnel if needed.

Technology Options
What technologies best dovetail with your security needs? If detection is a priority, technologies like radiofrequency can provide a high level of accuracy at a relatively low cost.

Technologies may also be combined; for example, RF can be complimented by the addition of radar for longer range and/or optical for visual identification and evidence collection.

Timeline to Airspace Security

Evaluate

☐ Gather any staff or organizations who may be affected by your security plan to discuss expectations. This could include: Security Team, IT Team, Operations Team, etc.

☐ Make a clear list of your security needs.

Research

☐ Examine offers for airspace security providers in your area & contact their sales representatives directly

☐ Ask for a demonstration. It's important to confirm that the technology works well on-site and not just in ideal conditions

☐ Once you've chosen an airspace security provider, set aside time for them to study your site layout and propose solutions

Prepare

☐ After signing your contract, prepare your site, removing any obstacles to installation and updating equipment or services if necessary

☐ Set aside time to train on the new system and don't forget to invite any personnel who may need to access the system in the future

Implement

☐ Your airspace is now secure! Ideally, your system should keep an easy-to-consult record of any and all drone intrusions, allowing you or the relevant authorities to further investigate incidents

Chapter IV – Choosing the Right Airspace Security Provider

In this chapter you will learn:

- What to look for in an Airspace Security Provider
- What to look for in an Airspace Security System

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Chapter IV –
Choosing the Right Airspace Security Provider

How can you choose the anti-drone solution that provides optimal airspace security at the best cost/efficiency ratio and over the longest possible period?

Technology Checklist:

☐ **Modular –** Can the technology be scaled up or down to fit the profile of your site?

☐ **Upgradable –** Is the technology a good long-term investment? Can it be easily updated to stay one step ahead of drone evolution without having to replace everything?

☐ **Durable –** Is the technology highly weather and stress resistant?

☐ **Ease of Installation/Integration –** Can the technology be easily installed on your site and/or integrated into your existing security system?

☐ **Ease of Use –** Is the technology simple to use with minimal training? Is there a User Interface and is it intuitive?

☐ **Operating Costs –** How much does it cost to run the technology? Does it consume large amounts of electricity? Does it require a dedicated staff member to operate?

☐ **Accurate/Reactive –** What are the technology's detection and false alarm rates? How quickly can it detect a drone within its coverage area?

☐ **Pilot Localization –** Can the technology locate the pilot as well as the drone, giving you the option of apprehending the person(s) behind the intrusion?

☐ **Effective Against Multiple Drones –** Drone swarms are the next big security challenge in airspace security. Can the provider's technology handle multiple drone intrusions without becoming saturated?

☐ **Low Interference –** Local authorities can be extremely sensitive about "frequency pollution". Is the provider's technology low interference or even passive?

☐ **High Quality/Fair Price –** While airspace security is an investment, it need not be excessively expensive. Does the provider offer a fair cost to quality ratio?

Provider Checklist:

☐ **Knowledgeable –** Do their representatives have experience in the defense and security sectors? Are their sales and training materials in-depth and accurate while remaining easy to understand?

☐ **Committed –** Does the provider offer post-sale service, regular updates and troubleshooting?

☐ **Trustworthy –** Ask the provider for references. Are they already protecting sites with a profile similar to yours? Who are the clients they serve? Does the provider promise the moon or are they honest about the strengths and limitations of their technologies?

☐ **Passionate –** Are they enthusiastic about airspace security; regularly introducing new innovations? Do they develop their own technology or purchase from third parties?

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About CerbAir

Founded in response to an alarming rise in drone security incidents, CerbAir is dedicated to offering the ultimate in anti-drone solutions.

Our in-house development and tool-box approach allow us to provide high-quality and flexible airspace security at a competitive price. With drones set to transform everyday life, CerbAir is committed to keeping our clients' sensitive airspace safe from rogue drone intrusions.

Contact Us

For more information about our company
and anti-drone solutions

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