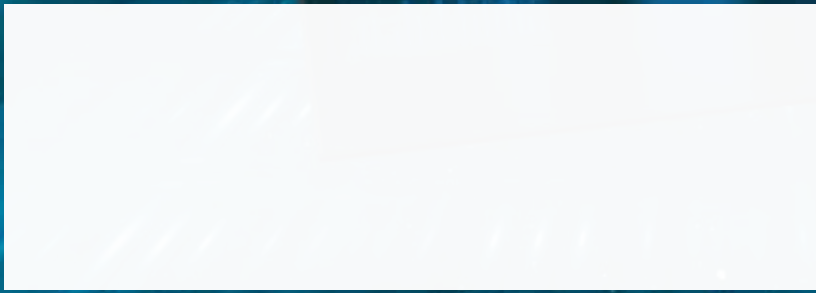


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AMERICAN CORRECTIONAL ASSOCIATION



# Drones

## Both an emerging threat and asset for correctional facilities

BY JOEL ANDERSON AND DAVID LEWIN



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Prisons have a new tool and new security risk — drones. On one hand, drones, also referred to as unmanned aerial vehicles (UAVs), have proven a useful tool at prisons for perimeter and site surveillance and as a security aid. On the other hand, the cheap and attainable aircraft are popular for criminals looking for new ways to deliver contraband into prison grounds.

The simultaneous use of drones — for good and disruption — within these high-security environments requires a proactive and collaborative security culture. A holistic approach to drones helps prisons get the most benefit from these emerging technologies and includes navigating the limiting laws governing drone safety and engagement, and the evolving capability of criminals who want to use these aircraft to infiltrate the prison perimeter.

In addition, standardized reporting of drone sightings at prisons was only adopted recently, making it hard to fully comprehend how much of a threat these aircraft have posed over the last decade. According to the National Institute of Justice, between 2015 and 2019, the Department of Justice reported only 130 drone incidents in federal prisons. However, once the Federal Bureau of Prisons adopted a formal reporting policy in 2018 the number of incidents recorded increased by 87%; the estimate now hovers at 243 suspected drone incidents at prisons every year.

According to reporting between 2022 and 2024, the number of incidents may actually be higher. This does not, however, take into account drones that are in prison airspace that security specialists do not see and report, or that detection technologies do not “see” by virtue of detection capability. Dark drones, for example, do not emit radio frequency waves and are thereby not detected by conventional RF detection solutions.

Easy to procure, manipulate, and operate, these small aircraft can cause big problems and are used by both armchair enthusiasts and criminals intent on causing real harm. Complicating this situation further, rapid changes in drone technology allow resourceful drone operators to continue to exploit gaps and find new methods for defeating existing countermeasures and legacy detection technologies.

As drones continue to become a persistent threat, this article will explore real-life experiences from the prison yard to shed light on how prison security operators are

combatting drone contraband drops, the kinds of technology modern prisons are adopting to stay a step ahead of bad actors and evolving drone technology and collaboration with local law enforcement to create a cohesive front in mitigating the ever-evolving contraband drone delivery landscape. The article will also make the case for integrating first-time drone programs for corrections departments that might be debating the value and return on investment.

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## **When the nets went up, the drones came out**

The introduction of physical barriers like nets around prison yards was initially seen as the primary method to prevent outsiders from smuggling contraband to inmates. This is because, historically, contraband drops consisted of outsiders tossing contraband over the prison fence. However, the erection of tall nets has not solved the problem. An unforeseen advancement in hobbyist aircraft spurred a criminal workaround: exploiting the gaps in the nets and dropping contraband onto the property via drones. With many prison security systems hyper-focused on manual throwovers, cunning criminals are turning to these aerial drops to maintain the delivery of illegal goods including cell phones, narcotics, weapons and more.

In the initial days of implementing the nets, the South Carolina Department of Corrections (SCDOC) saw an 80% reduction in the amount of contraband being delivered. Criminals simply couldn’t throw prohibited items over the fence, largely mitigating this pervasive threat.

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However, when the drone drops started, this changed everything and it was time to shift focus and analyze a new threat vector entirely.

The SCDOC team has seen all types of contraband being smuggled into its prisons over the years, ranging from drugs to mobile phones. For its team of security operators, the threat of these drone drops has major implications to the overall security of the prison system — not just in the sense of stopping dangerous goods from entering the premises, but also because the contraband market is incredibly lucrative and enticing. Inmates are willing to go to far lengths, especially monetarily, to get their hands on contraband and maintain their influence with crime affiliates on ‘the outside.’

A prime example is how much the department has seen the prices of black market mobile phones increase. In the past, a smartphone used to cost \$1,000

in the yard, while today that price has skyrocketed to \$5,000-\$8,000. In this sense, the drone operators are conducting a very profitable business.

### The evolution of drone technology and problems posed

As drone technology continues to advance at a rapid pace, the challenges for correctional facilities in managing security threats from these devices are intensifying. Drones that were once easily detectable are now evolving into more sophisticated machines capable of eluding traditional detection systems such as radio frequency (RF) sensors. This evolution necessitates a corresponding advancement in the security technologies employed by prisons to keep these unauthorized intrusions in check.



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### **Drones that RF Sensors do not detect**

A significant development in drone technology is the emergence of “dark drones,” which subvert detection by conventional RF sensors. These drones do not fly using radio frequency signal emission for directional control. Rather, the operators use pre-programmed on-board GPS waypoints or fly their drone using the 5G network. Both methods make the drone(s) undetectable by RF sensors which rely on monitoring the cataloged radio frequency signals that drive them. The stealth nature of dark drones poses a substantial threat as they can carry contraband over prison walls without alerting standard security measures. Similarly, drone pilots can use other alternative tactics to avert detection by RF sensors including operating via remote control within bands that are not scanned, and frequency hopping.

### **The proliferation of drone drop operations at night**

According to reports, the majority of drone drops occur in low-lighting situations after nightfall. Lieutenant Tyler Galloway, assistant project manager for the Division of Security at SCDOC and the manager of the prison system’s drone program offers, “85% of drone contraband drops across our facilities are occurring at night.” This points to both the sophistication of the aircraft and the ability of operators to successfully deliver products without the need for daylight. It also highlights the need for sensors that can detect drone activity, day and night.

### **Drones can carry heavier payloads than ever before**

Drones have also become increasingly sophisticated in the amount of goods they can carry in one trip. Members of SCDOC’s drone program shared that when drone contraband drops first started, payloads maxed out at about four pounds of contraband. This amounted to two or three cell phones and drug paraphernalia. Today, drones can carry up to 20 pounds of contraband in large duffel bags.

This increase in payload poses more serious questions about contraband, including the potential for a more robust black market within the prison walls and the entrance of more dangerous goods, such as weapons or the components to construct weapons. While SCDOC hasn’t experienced this firsthand, this type of drone drop is happening now.

Earlier this year, 150 people were arrested for conspiring and using drones to deliver cell phones, drugs and guns into prison yards. In other parts of the world, guns and other weapons have been delivered via drone and used by the population. Having observed the outcomes of such drops, there’s a growing concern about weapons entering the prison via drones, potentially causing massive chaos and loss of life.

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**“Today, drones can carry up to 20 pounds of contraband in large duffel bags.”**

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The evolving capabilities of drones highlight the need for full situational awareness in both air and ground operations within correctional facilities, as security operators must not only be monitoring fence throwovers, but also aerial drone drops. Situational awareness involves understanding the environment in every dimension to preemptively identify and mitigate threats before they materialize or while there’s still time to coordinate a response. This comprehensive approach requires an integration of various technologies that together provide a detailed overview of all activities around the prison perimeter.

### **Fighting drone contraband drops with drone fleets and multi-layered sensor solutions**

Recognizing the gravity of this new airborne threat, corrections departments have started to adopt perimeter intrusion detection systems (PIDS) that are able to detect threats approaching by ground and air simultaneously, and/or sites are installing stand-alone drone detection systems - both solutions reflect a multi-layered sensor approach that can detect, track and classify drones and provide the critical object data required to intercept unauthorized activity including drone contraband drops and

throwovers. Corrections security is also implementing their own drone fleets for additional surveillance.

From their security operations center (SOC), the SCDOC drone program team oversees a sophisticated control room. Multiple screens display real-time activity of various locations at multiple prison sites. Operators leverage command and control software and video management systems (VMS) to alert and focus attention on any facility experiencing a threat to figure out the dynamics of the situation. This is key because it allows for safer, more informed resource management, preventing the team from having to send manpower to the scene of the threat before understanding the risks (i.e. what the bag might contain, if it's in the hands of an inmate yet, and so on).

In addition, the data gathered via sensors and supporting system technologies helps corrections departments like SCDOC track and monitor threats over time. "Every month, I send out a report on how many drone attacks we've had. I break it down into how many drone attacks and packages we've recovered using technology and couple that information with any first-person accounts of staff reporting hearing or seeing a drone. We take all this information very seriously," said Lt. Galloway. "Based on our data, we believe that we are intercepting 85-90% of the contraband entering the prison perimeter."

But what kinds of sensors are feeding into this kind of advanced control room? The mark of a progressive perimeter intrusion detection and contraband deterrent system is a mix of several different kinds of sensors with each playing a critical role in securing the prison perimeter and alerting operators to threats when there is still time for a coordinated response.

Here are common drone detection sensors that shape situational awareness of the airspace above prison grounds.

- **Cameras:** Static and/or Pan-Tilt-Zoom (PTZ) cameras are essential for visual confirmation of threats identified by other sensors, allowing for more detailed monitoring of both ground and airborne activities. In the best-case scenario, these sensors are bolstered by radar since cameras alone are not sophisticated enough to "notice" a threat, maintain threat lock and can be notoriously unreliable at night and in adverse weather conditions.
- **Radar:** Radar systems play a pivotal role in drone detection by providing the first line of defense; they

can detect and track fast-moving objects at long distances, regardless of lighting or weather conditions. This capability makes radar indispensable for early warning of incoming drones, ensuring a timely response to potential threats from the air. Moreover, radar is the only sensor that can detect both traditional drones that emit RF signals and dark drones that evade RF detectors.

- **RF Detectors:** RF detectors have historically been the go-to radar for drone detection. However, this sensor is set to become obsolete as most criminal drone operators are privy to modifications that allow their drones to fly completely undetected by RF.
- **AeroScope:** An early counter-drone solution adopted by law enforcement including prison security, the AeroScope works to identify off-the-shelf DJI drones by utilizing a library of cataloged radio frequency signals. DJI drone users agree to a licensing agreement and supply their drone signal to the catalog. The AeroScope then accesses freely supplied information to identify information about the drone and user's location. Recently, prison security operators have become aware of AeroScope's limitations and inability to activate against dark drones which are preferred by criminals.
- **Acoustic Monitors:** Acoustic monitors detect changes in sound. They can be used to detect pipes or fences rattling, for example. They detect drones by tuning in to the unique sound signatures produced by their motors and propellers, providing an affordable additional layer of threat confirmation.

The key takeaway here is that an effective perimeter surveillance system, and certainly one that includes the need for detecting and tracking drones, requires a multi-sensor, layered solution to get the job done. No sensor can act alone and any system relying on one alone is susceptible to intrusion. In line with the need for multiple sensors with varying functions, Lt. Galloway shared that his team is exploring other sensors to fill gaps in detection. "We are looking into thermal cameras that can pick up drones in the nighttime by detecting heat from the propellers. We want to triangulate this with a detection system that uses RF and can point the cameras in the right direction," said Galloway. "In addition, we are exploring adding radar, so we can 'see everything'."

## How drones and counter-drone technology is creating collaboration between prisons and local law enforcement

The use of drone fleets and multi-layered counter-drone sensor solutions has also fostered unprecedented collaboration between correctional facilities and local law enforcement agencies.

The team at SCDOC actively collaborates with local police by engaging in real-time data sharing through its counter-drone solution to effectively mitigate drone contraband drops and apprehend drone operators.

Because local law enforcement gets the same real-time notifications as the prison does regarding drone contraband drops, prison security operators are able to focus on contraband interception inside the prison walls while local law enforcement can hone in on apprehending the pilot on the other side of the fence. This kind of collaboration allows both agencies to put their best foot forward and allocate their resources where they are most effective. This results in a win-win situation — securing the prison perimeter from all vantage points, while also bringing operators to justice.

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However, the collaboration doesn't end with contraband drops. The SCDOC team is eager to use its drone fleet to help local law enforcement solve different kinds of crime. Instead of just protecting the prison facilities, a top priority is to help local law enforcement by using the drone fleet in ad hoc missions to facilitate more rapid and effective responses to everything from escape

attempts, riot containment, missing persons searches, facility emergencies (fires, floods, or natural disasters), and the mitigation of large crime organizations that operate both in and outside prison walls.

## As drones evolve, prison drone programs are a must and the technology stack must remain nimble

As the struggle between security teams and contraband smugglers intensifies, prisons must stay vigilant and adaptable. The future might bring more sophisticated threats, such as drones capable of delivering weapons or other high-risk payloads. Inmates and their cohorts on the outside will try every avenue to get ahead of prison security, and corrections departments must continue to explore every avenue to stay ahead.

As we look to the future, it's of the utmost importance that corrections departments continually assess new technology and strengthen their anti-drone programs and drone fleets. This is especially true in light of ongoing staffing issues in the nation's corrections departments and the overall advancement and proliferation of drone technology in and outside the prison walls.

This exploration into the use of drones in prisons underscores the complexities and the dual nature of technology as both a facilitator of crime and an instrument of justice. As drones continue to evolve, so too must the strategies to harness their potential for good while mitigating their use for illicit purposes. **CT**



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