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Dark Skies: Criminal Drone Operations Targeting Prisons

A Critical Review of His Majesty's Prison Estate



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Executive Summary

The objective of this report is to examine the growing use of Unmanned Aerial Vehicles (UAVs) to aid serious and organised criminal groups in their nefarious mission. The report does so with a specific regard to His Majesty's Prison Estate within the UK. The author calls upon their own primary experiences and research, as well as making use of open-source information and intelligence. UAVs are being used effectively as a tool for smuggling and disrupting routine business in prisons and incarceration centres. The issue has been thoroughly examined and found to be escalating. Information is being shared between criminal networks effectively, leading to group learning and adaptations to avoid detection. The impact of this issue on the prison system is so profound that recent inspections by civil authorities have cited it as a risk to national security. The problem appears to be gaining traction at a time

when there is strong motivation and growing claims from industry leaders that there are effective countermeasures available to counter this threat.

There are global examples of the practical applications of this technology in the criminal world. Individuals exposed to advanced methods in theatres of war are at risk of returning their knowledge and tactics to the streets of the UK. This is a prolific threat in Central and South America, and a link can be drawn between this specific network of criminality and domestic crime groups in the UK via supply chains of controlled drugs and longstanding professional relationships.

The report provides a legislative review for the UK and highlights that the responsibility for managing this threat rests with geographically-based Home Office police forces, with some regional and national specialist units assisting in tackling an element of the more prolific and travelling cadre of offenders. There is evidence to suggest a legislative shortfall, combined with the ongoing effect of austerity on these authorities, thus creating a gap currently being exploited by the criminal element. A horizon scan shows existing proliferation of the technology and offers hypothetical projections based on evidence outlined in this document. These include:

- **Extended Operational Range:** For the UK, an island nation, this development raises the future risk of UAV threats originating from outside national borders. This not



only complicates jurisdictional issues for prosecutors but also reduces the effectiveness of existing border security measures in deterring criminal activity.

- **Increased Payload Capacity:** Modern UAVs possess the capability to transport significantly heavier loads, including the potential to lift individuals into or out of prison facilities, posing a direct risk to custodial security.
- **Weaponisation of UAVs:** The integration of firearms, explosives, and chemical agents into UAV platforms introduces serious risks to public safety and law enforcement.
- **Kinetic Deployment:** UAVs may be used as physical weapons, either as blunt force projectiles or as delivery systems for explosives triggered on impact.
- **Swarm Functionality:** Advancements in autonomous UAV programming allow for coordinated or independent operation of multiple drones. The evidence of overwhelming experienced and well-resourced law enforcement elsewhere in the world is presented within the report.

The report recommends further global research on this topic, with the aim of procuring affordable yet effective additions to the existing range of counter-UAV measures for specialists employed in the field of countering Unmanned Aerial Systems (UAS). It makes a strong case for

measured and considered investment and collaboration in the mitigation of this threat by civil authorities. The report calls for the collaboration of relevant operational specialists and subject matter experts with industry, to ensure that procurement and progress is guided and evidence based.

Introduction

There has been a marked global increase in the use and application of Unmanned Aerial Vehicles (UAVs) by organised criminality (Roder, A. & Choo, K-K.R. 2020). The use of such systems is now proliferating across the United Kingdom of Great Britain and Northern Ireland (UK), presenting a modern problem for its communities. Global responses to this threat are varied, and the authorities of the UK have much to consider and little time to address this problem. Organised criminals are leveraging drone technology to circumvent traditional security measures; their criminal operations transcends borders, with pilots tracked moving across the country, breaching security at various prisons throughout the estate (Argar and Ministry of Justice 2024).

Historically, civilisations have fixated on physical boundaries, whether to mark territorial control, keep adversaries out, or in the case of prisons, keep prisoners within a controlled environment. The rise and accessibility of this aerial technology undermines the historical concept of borders, which have long been a defining



feature of territorial control (Rogers 2021). This is as much a concern for protected prison sites as it is for national defence.

In terms of the understanding of legal responsibilities and accountable civil authorities within the UK, the National Police Chiefs' Council (NPCC), Civil Aviation Authority (CAA), Home Office (HO) and Department for Transport (DfT) established a Memorandum of Understanding (National Police Chiefs Council et al. 2016). This memorandum clearly places responsibility for enforcing laws against the nefarious use of UAVs on the desk of Home Office police forces.

The CAA defines drones as a subset of unmanned aircraft: "...common types of unmanned aircraft include drones and model aircraft. Drones include rotary wing drones and fixed wing drones...unmanned aircraft may be untethered or tethered...Unmanned Aircraft Systems (UAS) means an unmanned aircraft and the equipment to control it remotely. Remotely Piloted Aircraft Systems (RPAS), a remotely piloted aircraft, its associated remote pilot station(s), and required command and control links." (UK Civil Aviation Authority 2025). The CAA organises drone regulations primarily around weight and intended use of the craft. These can be split into three categories:

1. Craft weighing less than 250g: These are considered the lowest risk because of their minimal mass.

2. Craft weighing between 250g and 25kg: This category encompasses most commercial and professional devices. These devices carry more risk and as such, more considerations for both the operator and the CAA.

3. Craft weighing greater than 25kg: These devices are likely to be specialist in their nature or employment. They are subject to a more rigorous approval process. Operators must seek specific permissions from the CAA.

These weights are 'Overall Takeoff Weight' (OTW). Therefore, in the case of smuggling, payloads are included in the legal considerations of the weight of the craft. The report refers exclusively to 'Commercial Off The Shelf' (COTS) drones. These devices, by virtue of commercialism, are available to the public without restriction (Jackman 2022) and are relatively inexpensive compared to analogous military hardware (Black 2025).

The drone industry continues to grow. Companies based in China and those subsidised by the Chinese government now control a formidable 90% of the £3.29 billion consumer drone market (Rosen 2025; Statista, n.d.). These private companies are legally obligated to respond to information requests from the Chinese government, presenting a potential threat to state security, particularly when discussing sites of Critical National Infrastructure (CNI).



Crucially, these commercial devices are intuitive to use. The devices do not require extensive knowledge or time and resource intensive training. COTS drones are invariably designed for ease of use. Mass produced and mass marketed, this technology is now truly accessible to society. In the case of First-Person View (FPV) systems, hobbyist pilots are performing manoeuvres and capturing footage that was once exclusive to the domain of licensed aerial cinematographers (Zorić et al. 2022).

The Problem

As is the case with any instance of conveying prohibited articles into a prison, the threat and reality of smuggling into the estate through the use of UAVs aims to undermine the security regime in place at the establishment (Tschanz 2023). UAVs are another addition to the well-trodden smuggling routes already in existence (Norman 2023). The first step to effectively counter the problem is acknowledging and identifying the issue in its entirety.

The concept of prison is generally understood as the segregation of individuals from society, with the dual aims of protecting the public and rehabilitating offenders to reduce the risk of recidivism (Gul 2018). In the UK, most of the prison estate is archaic and in a state of disrepair. Where the sector has previously been cited as struggling to meet the growing demands of modern society, it is now failing on

several levels. A recent inspection on His Majesty's Prison (HMP) Long Lartin led to a report by His Majesty's Inspectorate of Prisons (HMIP) stating: "...The risks are clear for a jail that has, in effect, ceded the airspace above it to serious organised crime..." (HM Chief Inspector of Prisons 2024).

The decline of the estate and poor conditions have been accelerated considerably by years of austerity measures (Ismail 2020). The combination of failing infrastructure, increasing accessibility to the technology and the effectiveness of this technology is likely to be contributing to this problem becoming the practice of not only the most organised and affluent of the prison population but also the broader prison population. Pilots gain experience, their own independent reputation and means to connect with prisoners outside of their own hierarchy.

Organised criminality has been shown to be quick to evolve. A study conducted on tobacco smuggling over the Canada-USA border showed an almost instantaneous adaptation and collaboration by networks of different criminal organisations in response to cross-governmental actions (Legrand and Leuprecht 2021). This suggests that even competing criminal endeavours are information sharing against the common enemy, the "criminal justice system." Operational tactics and contingencies should be held as a priority to prevent or delay collusion and evolution.



The Business

An offender who continues to engage in criminal behaviour while incarcerated continues to be a risk to society, thereby undermining the fundamental objective of their imprisonment. Rather than disrupting criminal activity, the incarceration of certain high-risk individuals often leads to relocation and expansion of their operations, allowing them to strengthen their criminal networks. According to recent research, prisons have increasingly become fertile environments for organised crime (Gooch and Treadwell 2024).

To understand the nature of this problem, one must think of the benefit to an individual or a network of individuals in going to such levels of organisation to achieve their aims. The motivation is twofold, firstly financial: the value of commodities within the prison system is greatly inflated. This inflated value is attributed to restrictions of the environment, scarcity, and control of materials such as tobacco, and the prohibition of some articles such as mobile telephones and controlled drugs. Scarcity, along with the associated risks attributed to smuggling sees the value multiply significantly (Gooch and Treadwell 2020). Those willing and able to engage in these endeavours, if able to avoid detection and prosecution, can expect an inflated return on their investment for margins that are seldom seen on the common street of the UK.

Secondly, the reputation and social standing within the prison network and amongst one's peers is to be considered. In the age of communication, influence spreads more rapidly than ever before. The accessibility of mobile telephone devices within the prison system is an accelerant to this problem. Expensive cars have long signaled wealth and status; in the same way, UAVs are now used not just functionally but as displays of power, echoing patterns seen in South and Central America. Their visible use projects sophistication, intimidates rivals, and strengthens group cohesion (Kleinschmidt and Trenta 2022). Beyond delivering goods, UAVs serve as deliberate symbols of success, influence, and control that extend past the estate's boundaries.

Countering

There is ongoing work to counter this threat, including a national response to this problem via statutory instrument. The "Air Navigation Order" was adapted to restrict the airspace above each prison and young offenders institute, making it an offence to fly any craft in this airspace without the permission of the relevant authority. This is, however, a "summary only offence," meaning that the prosecuting agent has six months from the time of the offence to bring an offender before a court under statutory limitations rules (Magistrates Court Act 1980). Consequently, for the police and prisons alike it is difficult to prosecute pilots



within this time frame, unless there is a credible witness to the offence at the time and the offender is detained committing the offence. Any reliance on digital forensic recoveries of the metadata from the hard drive of the UAV would be likely to push any case beyond the statutory limitations.

His Majesty's Inspectorate of Constabulary and Fire and Rescue Service (HMICFRS) published a detailed digital forensics report in 2022. At that juncture, the body found 25,000 items awaiting examination, a backlog that starkly evidences the pressure faced by modern law enforcement striving to keep pace with a rapidly evolving digital world (His Majesty's Inspectorate of Constabulary and Fire & Rescue Services, 2022). There are potentially other specific offences relating to prisons that could be proven, but not without significant investment in time and resources by the relevant authority.

There is evidence of such investments being made; recent operational reforms have seen specialist police task forces established to combat the problem. Determined officers working effectively with His Majesty's Prison and Probation Service (HMPPS), have been breaking down silos to good effect (Gooch and Treadwell 2021). In the UK, geographical police forces are not rigidly bound by borders and boundaries, as seen in other countries. There is competing demand for forces' attention, and investigators and agencies are bound to manage resources appropriately. The inception of these specialist, regional and

national teams highlight the efforts made to operationally counter this threat. These teams provide a custom and almost dedicated response that alleviates disproportionate pressures on geographical forces for what is a national issue.

Moreover, the National Protective Security Authority (NPSA) is developing a dedicated strategy to counter the threat posed by Unmanned Aerial Systems (UAS) (National Protective Security Authority 2025). The National Police Chiefs Council (NPCC) has a dedicated team nationally targeting the issue of reckless and nefarious use of UAS. The Air Traffic Management and Unmanned Aircraft Act of 2023 (ATMUA) was borne of the Civil Aviation Act of 1982 and brought about new police powers that deal with the dynamic and lawful interception of nefarious or even reckless UAV pilots and operators.

With UAV technology evolving at its current rate, the authorities' reaction to advancements and the efforts at legislative change are understandably time consuming and taxing. The response by law enforcement is layered and varied but determined. The determination of individuals in this field calls for ongoing and thorough legislative review and support, in a bid to redress and rebalance this battlefield.

Evolution



It is difficult to predict how this problem will evolve as technology advances, or how civil authorities will react to the threat. Looking globally at the application of this technology, we can observe remotely piloted systems being used to deliver products and payloads over significant distances. As the payload capacity and range of UAVs continue to grow, the potential applications for payload delivery are limited only by imagination. In fact, there is an ongoing discussion around the practical application of UAVs in extracting casualties from high-risk environments such as battlefields. This progression would assist in the evacuation of casualties or timely and reduced risk critical-care transfers operations (McKnight et al. 2019). If this advancement is applied to the prison system, it could be argued that the ability to lift individuals into or out of lawful custody would have catastrophic consequences.

The long-range application of unmanned “Narco-Submarines” by criminality has been widely documented (Jaramillo 2016; Jones 2019), this could also be the case regarding UAVs as the range of these devices grows. (Kleinschmidt et al. 2022) This exploits an identified legislative gap in the UK. If a commercial UAV originates in another nation state, and has the range to reach a prison or other CNI site, it begs the question: How does this differ from other forms of kinetics? How could UK Law enforcement encourage or even command lawful collaboration between nations’ civil authorities, in the event of a cross-border investigation? The growth, adaptation and improvisation of the

technology could see increased payload and the criminal possibilities continue to broaden and evolve.

The war on Ukraine has evidenced that relatively primitive adaptations of mass-produced COTS drones can dramatically tilt the cost asymmetry of conflict towards the offense (Black 2025). We are beginning to see individuals with experience in this conflict and those experiencing similar elsewhere in the world returning to civilian life in the UK. They return with knowledge, anecdotes, and practical experience in this methodology. The individuals harbouring this and other niche experiences in the practical application of long-range UAVs have the knowledge to apply it to this growing threat. The report aims to evidence that the demand for growth and diversification of this threat is present.

“Drone Swarms” have been used to good effect elsewhere in the world. It is possible to adapt the technology for numerous UAVs to act as one swarm and fulfil autonomous action. Organised criminality within the USA overwhelmed Federal Bureau of Investigation (FBI) agents managing a hostage situation using a swarm tactic (Grimal and Sundaram 2018). The swarm of UAVs were programmed to conduct high-speed, low passes on FBI agents in observation posts. This forced the agents to retreat from their posts, effectively blinding the operation. The group live-streamed this drone footage to the online streaming and media platform: YouTube. This provided



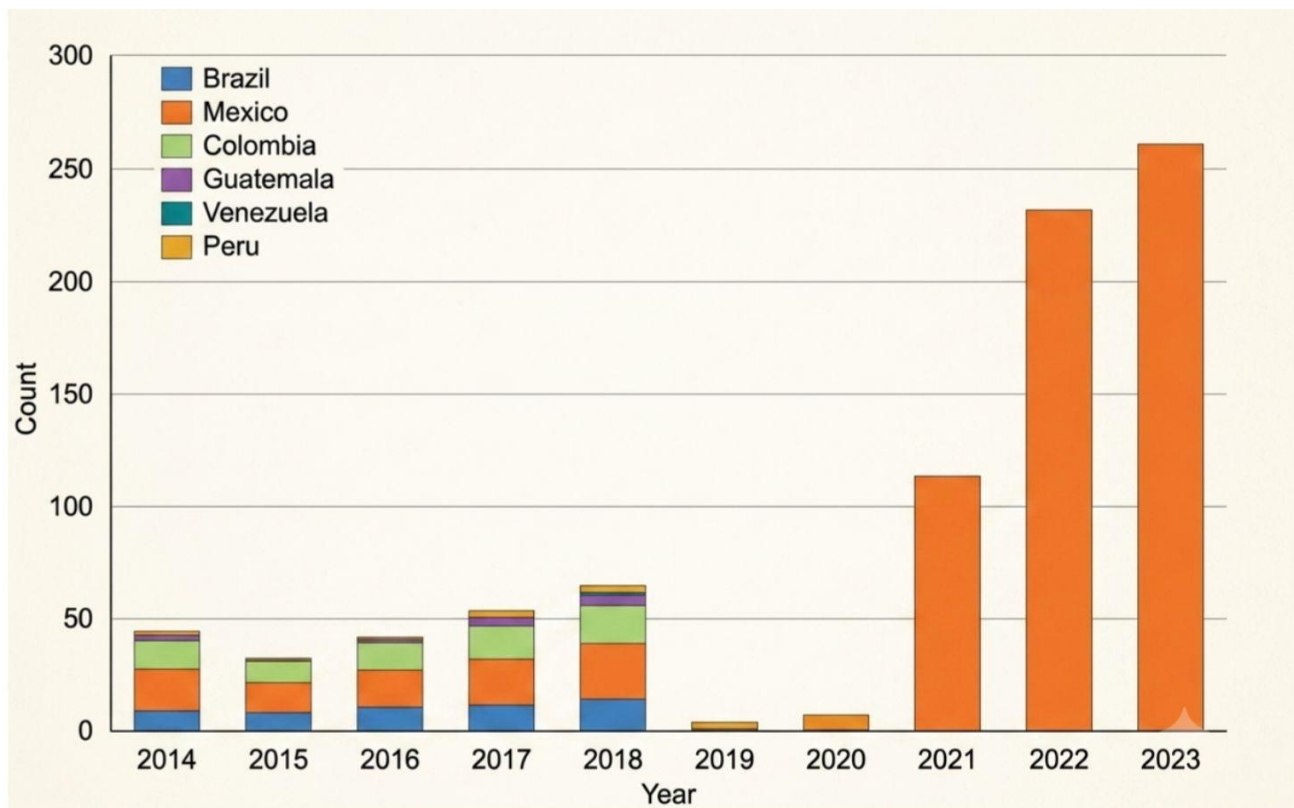
anyone with internet access, particularly their own accomplices and criminal associates, with the real-time movements of law enforcement agents. This case underscores the technologies' potential for counter surveillance, and as a weapon of disruption against law enforcement.

A timely reference to the disorder observed at HMP Manchester in April 1990: A small number of prisoners planned a limited protest about the prison conditions. The prison was subject to a siege for twenty-five days when staff withdrew to safety and the prisoners gained control of

the entire prison (Woolf 1991).

Contemporary deployment of UAVs as instruments of disruption against law enforcement operations, coupled with their ability to stream realtime surveillance data to prisoners equipped with smart devices, creates a plausible scenario in which organised prison unrest could be orchestrated.

The addition of kinetic weapon systems to UAVs would add another dimension to this problem. This is already routinely the case, particularly in Central and South America where cartels are utilising this technology



NOTE: The above chart is constructed using open-source intelligence on confirmed attacks of one or more drone across South and Central America between the years 2014 and 2023 (2024 figures were researched and found to be incomplete at the time of publication). While this information is limited due to its open-source nature, it nonetheless reveals a significant spread of criminal activity throughout the region.



(Kleinschmidt and Trenta 2022). The threshold into the use of kinetics has already been crossed by the Organised Criminal Group (OCG): *Cártel de Jalisco Nueva Generación* (CJNG). This group boasts control and influence worldwide and is already evidenced having strong supply chains for cocaine and methamphetamine markets in Europe (Felbab-Brown 2022).

There is growing evidence that its influence and control are already manifesting in the UK, particularly through the distribution of controlled substances. US federal drug agents report from their own experience that the CJNG having a large and disciplined army, institutionalised in the use of weaponised drones (Suárez 2021). These kinetics have been used against police, military officials and rival criminality (Kuhn et al. 2020). Take this advancement with the existing information sharing between criminal organisations and it presents the formidable theory that without the right investment and direction it may be a matter of "when" and not "if" we see this applied methodology in the prison estate or the employment of this technology in aiding individual(s) in absconding from lawful custody.

Practical Implications

Inaction, or a lethargic response by civil authorities to this threat is likely to exacerbate this issue. Left to operate freely, OCGs have been known to expand rapidly

and utilize their "freedom" to experiment in novel yet concerning ways.

In 2019, Chinese criminal groups used drones to spread pork contaminated with African swine fever onto farms, extorting rural pig farmers. The outbreak had already reduced China's pig herd by about 40 percent, and the deliberate contamination further crippled farmers' livelihoods while driving up pork prices under gang control (Reuters 2019). Lacking official protection, some farmers turned to improvised countermeasures, buying off-the-shelf jamming devices to block drones. But these unregulated tools interfered with civil and commercial aviation, showing how poorly informed responses to UAV threats can endanger wider society.

In a society increasingly reliant on technology, one could consider the hypothetical situation that an OCG deploys an electronic device to eliminate all signals on a specific frequency, purely with the intention of disrupting rival inbound payload deliveries of contraband to one or even several prisons in the locality.

Should this specific frequency be shared by remote camera doorbells and CCTV systems in the neighbouring community, this could lead to intimidation and feelings of insecurity amongst the members of community—their domestic equipment and security measures failing without explanation. The specific affected frequency may be shared with ambulance control. The disruption could thus directly



contribute to a withdrawal or significant reduction in life critical aid across the locality. This hypothesis serves as a reminder of the potential impact of this technology, and the importance of a timely, proportionate, and comprehensive response to the threat when it is realised.

The motivation exists within the law enforcement communities to effectively combat this threat. This, evident by the application of specialists to this growing area. There is no observed apathy from the rank and file of the service from the research undertaken for this report. Certainly, in the case of the threat to the prisons there is evidence of effective collaboration in a bid to counter the threat. Research shows a considerable number of international private companies offering various hardware and software solutions, to the threat of UAVs.

These offerings are routinely subject to rigorous testing and standardisation by government agencies such as the NPSA and the Department of Science and Technology Laboratory before they may be considered as a tactical option during policing operations.

There is a current gap for research and learning. The private sector may carry technical solutions to this threat, but it is seldom the case that they also carry the necessary operational experiences. It is the cohesion of these two schools that is most likely to yield the most effective outcome. The report has served to evidence that

some legislative changes have taken place and are a positive step for the UK. Although the practical application of these legislative changes, certainly in the case of the ANO present challenges for an investigator.

The implications of effective legal control of this matter will serve to identify key individuals engaged in large scale conveyancing of prohibited articles into prisons. It will also serve to push criminality back to their more well-trodden paths of smuggling. These pathways carry risk too, but with the absence of the risk of an untrained and unregulated pilot flying an insecure device, adapted to carry a load that in many cases it wasn't designed or manufactured to carry. This practice causes instability and exposes those near to the device to enhanced risk. If the tools and menu of tactical options available to civil authorities for combating this threat are sufficiently resilient and diverse to effectively counter and frustrate these criminal efforts in the medium to long term. It could be likely that criminal elements would resort to their previous methods of smuggling to meet the demands of their nefarious business. Those individuals taking on the practical role of flying these devices are still in relative infancy. They are currently building their confidence and reputation in this field every day they operate without hindrance or the intervention of justice.

A possible consequence of the appropriate investment of resources in countering UAS could lead to UAVs no longer being a viable



option for serious organised criminals as a tool of their trade. This could serve to negate the diversification of pilots, and the adoption of more violent applications observed elsewhere in the criminal world.

Recommendations

1. A research mission to obtain global primary research from a variety of CNI sites including prison estates. Conducted to exploring effective, achievable and affordable mitigation to this threat for the UK environment.
2. To mandate frequent and thorough defensive assessments of the HMP estate from the threat of drones. These assessments should be completed by a specialist in the field of counter drones and submitted to the Chief Officer of the relevant Home Office police force, the governor of the relevant establishment (HMPPS) and the portfolio holder within the Regional Organised Crime Unit (ROCU) in a timely manner. A proportionate defensive action plan should be agreed by all the above stakeholders based on hostile drone activity at the relevant site.
3. To mandate a regional counter drone trigger plan and debriefing process for nefarious drones carrying unidentified payload and any weaponised UAVs. To be managed by regional specialists in this field.
4. Amendment of the offence of “flight within a protected airspace” under Article 239 of the Air Navigation Order of 2019 as an ‘either way offence’ replacing its status as a ‘summary only offence’. This affords consideration to prosecution costs and the effective proportionality of law enforcement when tackling this issue. This would also serve to protect any prosecution carrying significant gravitas by means of forensic process.
5. The addition of an either way offence of ‘conveying prohibited articles into His Majesty's Prison via unmanned craft’. This is specifically aimed at targeting smugglers into the estate.
6. The addition of two new summary offences of ‘operating a prohibited craft’ and ‘Operating an Unmanned Aerial Vehicle (UAV) in a dangerous condition.’, this, done with a view defining dangerous alterations and adaptations to commercially available craft. This offence would see the addition of payloads, covering of mandated lighting and determined software workarounds as absolute offences similar to legislation observed under the UK’s Road Traffic Act 1991.
7. The implementation of street disposal methods for law enforcement to summary only offences identified via both the Air Navigation Order 2019 and Air Traffic Management & Unmanned Aircraft Act of 2023. This would see a



reduction in costs to law enforcement and expedite the processing of the reckless as opposed to determined and criminal element.

8. The creation of a permanent Joint Airspace Command Cell, enabling critical information sharing. This problem has shown to be cross-border in nature. Mandatory data sharing between the home office forces, the Civil Aviation Authority and the armed forces of the UK would result in CNI sites being better protected against this threat. Impending prosecutions, pertinent intelligence and convictions against determined organised individuals could be shared lawfully between these agencies in a timely manner.
9. To mandate inclusion of operationally experienced specialists in countering drones during the testing phase of countermeasures. This would ensure that mitigation remains focused on the practical and rapidly evolving problem.
10. To empower the judiciary with the discretion to grant obligatory disqualification to individuals from owning, operating, flying or causing another to fly a drone as an agent of the individual post-conviction of one or more relevant offences. This would serve to narrow the pool of experience amongst criminality.

It is often the case that smuggling adopts the path of least resistance. This technology and the effective countering of this threat is elaborate, involved and taxing for those specialists tasked with this mission. The dangers and additional risk of an unregulated device being piloted by an untrained pilot are clear. The rise in the application of this technology by the criminal element could be linked to the frustration of more traditional methods of penetration. As this issue cannot be tackled in isolation by one agency there is work to be observed beyond the borders of the UK. The report has documented numerous examples of this issue being global, there are a variety of responses to this problem. These various methods of countering, including relevant legislation should be researched, considered and where appropriate realised in the UK to assist in this mission. Using evidence to approximate the future of this issue, while hypothetical, leads to the reality of UAVs used by organised criminality for increased range, improved payload, swarm and kinetic delivery. It shows diversification in equipment and the application of this hardware in other aspects of criminality. There is a profound issue to be recognised and addressed, especially in relation to His Majesty's Prison Estate and the organised criminality contained therein. This is an opportunity to further the fight against this determined and well-resourced criminal element. These opportunities rarely present themselves; the UK stands at a crossroads.

Conclusion



Jack Venables is an experienced Bronze Commander and Tactical Advisor specialising in countering unmanned aerial systems. A subject matter expert on nefarious UAS, he has served as a UK police officer for over fifteen years, primarily targeting serious and organized criminality. Jack has led defensive and public safety counter drone operations across the United Kingdom and has collaborated on operational deployments and research with military organisations, security services and academic partners. In 2025 he joined the Regional Prison Intelligence Unit within the UK's North West Regional Organised Crime Unit, where he supports efforts to tackle drone enabled organised criminality.

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