



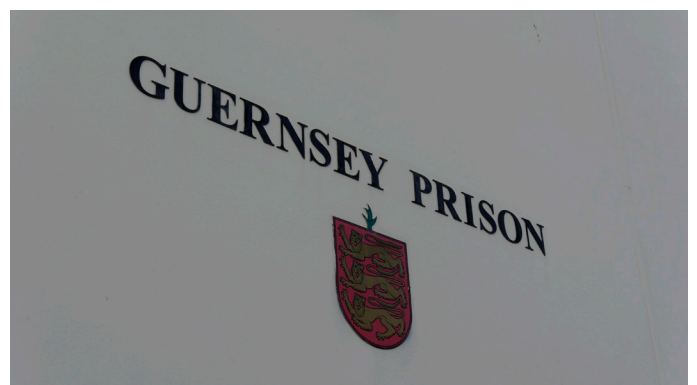
PROJECT OVERVIEW

Drone Defence (inventor) along with Eclipse Digital Solutions (installer) and Guernsey Prison (end user) deployed the world's first fully automatic drone detection and mitigation system to prevent drones from being used by criminals to deliver drugs into a prison. The system is called SkyFence.

By using multiple, low powered and directional transmitters strategically placed around the perimeter fence of the prison, we were able to produce a disruptive barrier which prevents drones from being flown into the airspace of the Prison.

The SkyFence system is triggered by a radio frequency scanning system, which detects if a drone is within a certain radius of the prison. It informs the Prison's control room and automatically activates SkyFence, in order to prevent the drone from completing its illegal mission.

The precise nature of SkyFence's disruptive field means that it only affects drones being flown illegally in the Prison's airspace.



It causes no harm to the drone, which either; returns to its home location or lands under control.

WHAT DID THE PROJECT INVOLVE?

While some elements of the project remain operationally and commercially sensitive, in broad terms, the deployment of SkyFence included a multi-phased approach. A number of variables needed to be determined including the extent of the drone threat posed to the Prison, the likely vectors of attack, the operational impact on the Prison and a complete mitigation plan include hard and soft countermeasures.

- The first phase was to establish a baseline of drone activity in the area to understand any operating patterns.
- Next, was to identify likely approach vectors and conduct extensive simulation testing.
- Based on the results of the previous phases, SkyFence system design came next and an installation schedule was completed.
- Once the system was installed, it was extensively tested and commissioned, while concurrent administrative and legal work was completed.

A year after installation in 2017, legislation in Guernsey was amended to allow the SkyFence system to be fully operated.

PROJECT CHALLENGES

There were four significant challenges we had to address when implementing the project. These were; commercial, technological, legislative and liability related.

1. **Commercial** - The commercial challenge was to create a system which was at a price-point a customer would be willing to pay. This involved extensive market research to determine the impact of illegal drone use in prisons and then investigations into mixes of technologies to mitigate the threat. It was a challenge to produce a system to a budget and then have it fully tested to conform to the various European standards.
2. **Technological** - The technological challenge was also significant. A fine balance had to be achieved to deliver a proportional effect which would only disrupt the drone when flown illegally in the airspace above the prison. To address these issues, numerous tests were conducted with various transmission power levels and antenna designs. After six months of testing a suitable design was finalized and show to work extremely well in the deployed environment.
3. **Legislative** - In terms of legislation there were some hurdles to overcome. Drone are currently protected by the Aviation Security Act and signal jamming is prohibited under the Wireless Telegraphy Act. The benefit of launching SkyFence in Guernsey was that, while their base laws come from the UK, they have the ability to adjust them to meet their own needs. Therefore, they had the ability to amend the existing rules to allow for SkyFence to interrupt the control signal of the drone.

While all proper due diligence was followed and UK authorities were involved in the decision, Guernsey change their laws and included the necessary provisions to allow the system to be used. We predict that this process could also be adopted in the UK to allow implementation of SkyFence across the UK prison estate.



4. **Liability** - Finally, we had to overcome liability issues. The question was what would happen if a drone was damaged or caused damage/injury if affected by SkyFence. Again, extensive testing was required and a case put towards an underwriter to provide cover, which we eventually secured. This was the final piece of the puzzle to allow the system to be deployed and operated.



WHY IS IT NEEDED?

Drones are now being used on a weekly basis to deliver drugs, mobile phones, weapons and other contraband into prisons across the UK. Since 2013 the reported number of incidents has increased dramatically across the country and the problem is now getting to epidemic proportions.

A former prisoner said; 'A £20 bag of Heroin is worth £100 on the inside. A smartphone will sell for between £800 and £1000.'

When criminals can make this much money and have little chance of being caught you can see when they are happy to fly small drones over the perimeter fence into a prison.

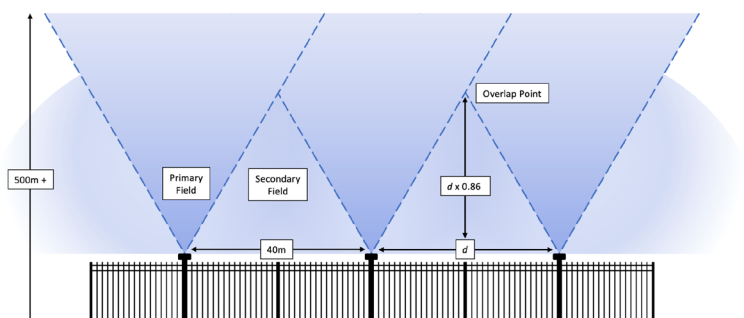
WHAT IS & HOW DOES SKYFENCE WORK?

If a facility security manager wants to stop a drone from coming into their airspace, then Drone Defence have developed the system for them. SkyFence is an electronic countermeasures system which creates an electronic fence which extends up to 500m in height that a drone cannot penetrate.

By disrupting the drone's command and navigation radio transmissions it harmlessly stops the flight. It works 24/7, in any weather, day or night. As a system, it uses multiple low-powered radio transmitters which are strategically placed around the protected site. When activated, they transmit a signal which is designed to overwhelm the drone's radio transmissions. This breaks the control and video link between the drone and its operator. Importantly it causes no harm to the drone or any personnel on the ground.

SkyFence is safe, fully programmable and can be activated via a suite of sensors or human input.

The emerging drone industry has huge commercial potential, and the UK is currently a world leader in terms of capabilities, applications, and permissive legislation.



In post-Brexit Britain, the explosion in commercially licensed operators is a testament to the fact that entrepreneurs across the country are seeking new ways to exploit drone technology to further their businesses. From taking pictures of weddings to conducting complex industrial inspections the potential is real and growing.

This is where drone security businesses like Drone Defence come in. By delivering effective and commercially viable counter drone solutions, like SkyFence, organisations who wish to protect themselves now can.

Instead of turning to the Government to firm up legislation on drone use they can now employ cutting edge technology to protect their infrastructure.



UPDATE: 2025 GUIDANCE FOR CATEGORY A PRISONS

A new report from the House of Commons has sent a clear message to the Ministry of Justice.

It recommends that the Ministry of Justice urgently installs a Sky Fence system, across all Category A prisons in England and Wales.

The call follows growing concern about the rapid pace of drone development and the increasing threat drones pose to prison security. The report warns that without decisive action, prisons could soon face far more serious risks than contraband drops, including escape attempts and the delivery of firearms. It calls for a robust national strategy and for high-risk prisons to be fully equipped with anti-drone defences and improved physical security within two years.

Guernsey Prison led the way in 2017 when it deployed the Sky Fence system. Its success has proven that the technology works and with drone threats escalating fast, Sky Fence is no longer a luxury. It is a necessity for every high-security prison.



ABOUT US

We believe the future of aviation is sustainable, small and automated. Drones will change the way we monitor, manage and move around our fragile planet.

Drone Defence have developed a broad portfolio of critical enabling technologies for the drone industry.

Drone Defence produce equipment, integrated systems and assured data services, to deliver a common airspace surveillance picture, along with mitigation equipment for authorised users.

FIND OUT MORE

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