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Detecting unauthorised drone use

The use of drones or unmanned aerial vehicles provides a valuable service for many industries and sectors both in the UK and around the world. Jobs that once required the rental of expensive equipment or were dangerous to carry out such as pylon inspection, roof inspection and crop monitoring can now be done with ease using the latest drone technology. But while most drones are used for legitimate tasks such as crop monitoring or building surveys there are a small number of users who may opt to use the technology for delinquent or criminal activities. Ben Duke of COPTRZ explains how to detect and monitor against unauthorised drone use.

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Small wonder then that the market for drones is set to explode. According to a recent report by Price Waterhouse Coopers it is estimated that there will be around 76,000 drones flying in UK airspace by 2030 with drones contributing up to £42 billion to the UK economy.

Why the need for drone detection?

But while most drones are used for legitimate tasks such as crop monitoring or building surveys there are a small number of users who may opt to use the technology for delinquent or criminal activities. While the number of crimes committed by drones is still quite small it is certainly on the increase, during 2016 the UK police received 3456 reports of that's a 352 percent increase on the year before.

The list of criminal activities a drone can be used for is almost endless. Today's drones use state-of-the-art imaging equipment which can be used to commit a range of crimes including spying on individuals to obtain PIN numbers, identifying the weak points of property security systems, carrying out corporate espionage by covertly monitoring employees or buildings and smuggling contraband across borders and into prisons. There are even reports of drones being used by criminal gangs to intimidate locals.

The criminal use of drones isn't the only problem, there is also a risk of careless and reckless drone flying causing a danger to other aircraft by accidentally flying into restricted airspace or

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causing death or injury to people on the ground if they crash in heavily populated areas. While it is a crime for causing death by dangerous driving, there is no such equivalent for dangerous drone flying.

Governments also recognise the risks that reckless or criminal drone flying represents. In May 2018 the UK government introduced new legislation which places restrictions on drones with the capability of flying above 400ft and restricts flying within 1km of an airport boundary. New drone pilots will also have to pass an online safety test. Drone pilots who breach the restrictions face unlimited fines and up to five years in prison.

How to detect and monitor against unauthorised drone use?

While new legislation may help reduce the number of incidents it is likely that determined criminals will still attempt to compromise security systems with the use of drone technology. So it is important that organisations take appropriate measures to limit the risk by implementing effective drone detection systems.

The most effective drone mitigation systems use a multi-layered approach which consists of a network of video cameras, infrared and RF sensors which are managed by analytics software to detect, monitor and control drones which are trespassing on the property. This system can then be integrated with traditional security measures such as on-site personnel and local law enforcement to provide 365-day protection for employees and property.

One such system is AeroScope from DJI. AeroScope can be deployed as a fixed or portable solution which is able to detect drones in extreme and hostile environments including those with high levels of humidity which often causes problems for other drone detection systems. Once detected drones can be tracked in real time and signal data can be retrieved to help identify the location of the pilot.

How can AeroScope be deployed?

DJI AeroScope can be deployed as a portable or fixed solution to detect trespassing drones within a fixed area. The system has a variable range depending on its location and the size of the antenna being used. Typically, fixed units have a larger antenna which can cover an area up to 25 square miles. Compact portable units are able to cover an area up to 10 square miles depending on the terrain.

Portable units are completely self-sufficient and come in a hard case which is easily transportable allowing the unit to be used by mobile security personnel at an airport or other secure environments. The mobile operator will receive alerts from trespassing drones along with drone serial number, current airspeed and the location of the pilot. Once identified, security personnel can attend the pilot's location to warn the individual that restricted drone usage is in operation.

Fixed systems use a number of large aerials located around the site which are connected to a central monitoring station. Because fixed antenna units have a much larger range they can cover greater distances than mobile units. Typically, a fixed antenna will have a range of up to 25 square miles allowing security teams to cover an entire site such as an airport apron or prison from a single monitoring station.

Who is AeroScope for?

AeroScope is designed for use by security professionals and law enforcement services to protect property and individuals. To ensure personal data is protected companies that wish to use the system have to be approved prior to use by DJI. Key markets for the drone detection system include airports, prisons and open-air stadiums. The organisers of events that take place in large open areas such as festivals and concerts are also considered suitable users for the system.

The type of system required is dependent on the facilities to be protected. A combination of fixed and mobile units can be deployed to help protect large areas such as airport perimeters and military installations. While fixed units are most suitable for facilities which have onsite security personnel available to monitor the central management station, mobile solutions are best suited to smaller sites or those covering one-off events. **GMC**

DJI AeroScope. Photo courtesy of DJI