Case Study: London Stansted Airport

Wide Area Perimeter Surveillance Using Blighter Radar
With 27 million passengers and over 250 million tonnes of freight, **London Stansted** is already the UK's fourth busiest airport, but with the runway still at only 50% capacity the potential for continued growth remains very positive.

The airport’s owners – **Manchester Airport Group** – boast a catchment area covering 75% of the UK population from their three facilities at Manchester, East Midlands and Stansted. Served by some of the best ground transportation links in the country, their airports occupy the whole of the key strategic North-South corridor, providing global connectivity to the Nation's three largest cities.

As was amply demonstrated with the interruption to operations at Gatwick and Heathrow Airports during the run-up to Christmas 2018, the potential for reputational and economic damage at major airports as a result of security incidents is extremely high, and with what appears to be a trend towards disruptive protestors targeting the aviation sector, the risk of further incidents in the future remains both real and likely.

**Blighter** has been working with **MAG** at London Stansted along with the Group’s integration partner **Stanley Security** to develop an advanced new protection scheme, aimed at combating the major issues associated with wide area surveillance, and providing airport operators with the level of situational awareness they need to safely maintain the flow of aircraft and passengers in this highly competitive and economically vital industry.
The Stakeholders

**STANLEY Security** has been providing world-class service for over 50 years with over 300,000 satisfied customers, and is one of the 500 largest public companies in the U.S., worth over 10 billion USD. The company operates in 131 locations worldwide, with over 45,000 employees while maintaining the level of close customer support found only with a local service provider, working with MAG Group both at Manchester as well as Stansted where they have been providing integrated security systems expertise for over 10 years.

**MAG** catered for over 59 million passengers in the past year at their multi-award winning facilities, including Best UK Airport for their flagship Manchester International Airport from 2015 to 2018. The Group’s choice of Genetec's Security Centre product unifies operations, delivering intuitive operations for effective security management across all of their facilities working on a single platform.

**Blighter's** range of high-availability e-scan Doppler radars integrate seamlessly with Genetec Security Centre & Mission Control, providing a range of advanced features and functions including Dynamic Virtual Perimeters for wide area surveillance and Five Dimensional Detection capabilities, delivering unprecedented multi-function protection for aviation and critical facilities.
Although the airport environment is governed by sets of rules defined and enforced by national and international regulatory bodies with the aim of maintaining safety and security for airport users and stakeholders, the operational needs of the airport change all of the time, and often, so do the perimeter definitions.

Fixed physical lines of demarcation – such as the perimeter fence and the edges of the runway – remain in the same place for most of the time, but expansion and renovation works can alter these, and under special security conditions (i.e. hijacks, VIP traffic, criminal and immigrant movements or hazardous material handling, for instance), new or temporary secure zones may need to be created and managed.

At Stansted, changes to the requirements in demarcation between controlled and restricted zones created the need to be able to monitor movement of ground traffic adjacent the flight line, automatically detecting targets that cross into the controlled zone and directing CCTV cameras to view these infringements.

New security procedures also enhanced the need to monitor some areas of the airfield in order to detect and track intruders and unauthorized people or vehicles, preventing them from coming into proximity with the aircraft.

Incidents involving protestors at Stansted and other London airports have highlighted the need for systems that can provide rapid detection and location of unauthorised persons on or near the runway, presenting a hazard to air traffic and endangering themselves.

Obstruction and passive resistance are not the types of behaviour that many security systems were designed to deal with, but the adoption of these techniques is forcing us to re-look at how we design and deploy airport security technologies.

Taxiways and aircraft stands are already high-traffic environments, and it is important that operators are not swamped with even more sensor data that could result in them becoming confused, distracted or desensitized, tying up valuable resources and potentially missing the real events when they happen.

These challenges, along with the need to reliably detect targets across large areas made it impractical to use other technologies, and Blighter’s B400 series ground surveillance radars with integrated ADS-B receiver, and seamless Genetec Security Centre unified management platform integration became the obvious choice.
Manchester Airport Group had already begun the adoption of Genetec's advanced suite of unified security management solutions across their sites, handling CCTV cameras and the user interface for operators in the control rooms, who monitor the facility and gather situational awareness information that guides airport operations. The simple map-based user interface provided by Genetec Security Centre and Mission Control is ideally suited to the monitoring of large geographic areas where the inputs from a range of different sensors need to be fused into a common operating picture.

The Stanley Security on-site technical team at Stansted were instrumental in designing the solution and putting in place the underlying infrastructure, selecting and integrating the various sensor technologies, working with legacy systems and matching the security system operation to the end-user needs.

Blighter’s radar deployment couldn’t be much easier, with extremely low power requirements, and just a single network port for each location, the radars are rugged, with no moving parts and are fully protected against the environment, even in the harshest locations. Each radar is supplied with the appropriate set of mounting brackets, allowing it to be fixed to an existing structure where one is available, or installed on standard columns along with other surveillance equipment.

Each Blighter B400 radar unit provides 90° of horizontal coverage, so that very large areas can easily be covered by combining multiple units. The exceptionally wide vertical beamwidth along with the FMCW e-scan technology enables each B400 to simultaneously track up to 700 targets per scan, regardless of whether they are close to the radar or in the distance.

Once installed, the radars at Stansted were integrated with existing pan/tilt/zoom high performance cameras from Bosch to provide “slew to cue” operation, automatically pointing the camera at any detected target area so that an operator could identify and classify the alarm with the minimum of user intervention.

The BlighterView HMI software provides a simple to use standalone interface through which one or more radars may be configured and used, and this is how the initial radar application was delivered during the implementation. Once configured, Blighter's fully certified integration with the Genetec's Restricted Security Area (RSA) Plugin was used to enable the operator to gain the advantages of Genetec's sophisticated zone and incident management functionality, as well as seamless integration with the facility's other security assets, such as CCTV cameras, fence sensors etc.

An ADS-B receiver was deployed and integrated with the Blighter system so that a radar detection exclusion zone could be created around each ADS-B beacon, thereby preventing false triggers from white-listed vehicles on the ground.
The airport environment is one of the most challenging places to deploy complex technology, and in almost every instance any new introduction needs to be blend with legacy technologies and multiple stakeholder priorities. Collaboration and teamwork are a must, with a set of shared and well-communicated objectives so that surprises are avoided and everyone’s expectations are met.

Blighter Surveillance Systems and Stanley Security have worked closely throughout the planning and implementation of this project, with the full cooperation and support of the team at MAG. Without this level of cooperative engagement throughout it is hard to see how the project could have been executed so well. Every credit must be given to the hard work and dedication of everyone involved.

Partnership and shared responsibility is at the heart of Blighter’s integrator engagement. By establishing a relationship based on trust and technical integrity we build long term business partnerships that enable our integrators to offer the sophisticated capability of Blighter radars to their end users, with the assurance that they will not be left unsupported in the field.

Stansted Airport replaced its Virtual Boundary Detection system in 2017 with a Blighter Ground Surveillance Radar. The deployment safeguarded the expansion of the existing Virtual Boundary from 1.2 km to 1.7 km in support of a Cul-De-Sac Expansion Project. The system continues to provide robust detection of incursions across our Virtual Boundary. The flexibility of the solution will add simplicity to the anticipated redefinition of the airports Critical Part boundary.

Kristin Young, Airside Security Manager, Airside Operations, Stansted Airport

The wide-area monitoring capabilities of our B400 series radars make it possible to fulfil multiple surveillance roles simultaneously. By combining this with existing CCTV and Security Management platforms, we provide a cost effective way to enhance situational awareness and operational efficiency in complex environments such as airports.

Geoff Moore, Business Development Manager, Blighter Surveillance Systems Ltd
Future Developments

Even as the original implementation of the radar based solution was being rolled out at Stansted, Manchester Airport Group were already making plans for the further expansion of the Genetec solution across all of their facilities in the UK, and with work well under way on the design phase for a new terminal at the UK’s forth busiest airport, the range of potential applications for radar at the airport is only just starting to be recognized.

Blighter’s ability to establish Dynamic Virtual Perimeters – any time, any place and any shape – using a simple graphical mapping interface provides airport security teams with the flexibility they need to be able to manipulate their secure perimeters without needing to move or change the equipment in the field. The rules determining how each perimeter reacts to intruders and what the security system does in response can be defined and automated too, reducing the burden on control room staff who are able to handle the radar data within a common operating picture and following well defined security procedures. Cost is always a factor, and the ability to cover wide areas with a single radar rather than installing many distributed sensors with all of the supporting infrastructure that’s needed on a long fence line significantly reduces the cost of implementation, while also going a long way to eliminating much of the carbon dioxide released during the construction process.

Future expansion of the airport or changes to the perimeter or zone demarcations can all be accommodated with much less impact on infrastructure or disruption of operations.

"Stanley Security continues to modernise and consolidate security surveillance technologies at STN, including the introduction of Blighter radar in support of the facility’s existing perimeter protection and CCTV systems. The ability to combine conventional PIDS with the radar’s wide area detection and automatic cueing of cameras via the Genetec platform provides a reliable layered security picture to control room staff.

Jon Morris, Technical Sales Manager, Stanley Security"