

Emerging Technologies: new offerings for 2005

There are many new security technologies lurking in the wings. Some may yet take centre stage in the industry's attempt to prevent criminal acts against civil aviation. Philip Baum rounds up a few of the latest offerings to hit the market that offer an innovative approach to resolving a long-standing problem.

There has been considerable focus on passenger screening technology, especially since 11 September 2001. As a result, whenever technology reviews are published, it is this area that gets most coverage. Airport perimeter protection and access control are, however, equally important. With that in mind, we start the 2005 review working from the outside in...

Wireless Security

Topguard, part of CRH Fencing & Security, has recently developed a wireless security system called "SmartGuard". The system detects unwanted intruders through a perimeter and is ideal for temporary security installations or for locations where it is either impossible or too expensive to install wiring cables.

Topguard has also recently launched "Secuscan" (see image and diagram on facing page), a system designed for checking the underside of vehicles for explosives, weapons and drugs. Given the need for certain types of vehicles to require airside access at airports, yet also to be screened, "Secuscan" offers airports greater protection.

Access Control

Checking vehicles is one thing, airport personnel another. Many of the demands for high security solutions in this area resulting from the emerging threats in society are now answered with the new Boon Edam StereoVision technology. With StereoVision,



in a Boon Edam Tourlock, piggybacking at a high security entrance can be reliably and accurately detected.

StereoVision is a highly sophisticated security system that recognises shapes, size and volume in three dimensions. By analysing such data, the system determines the number of people attempting to enter on one authorisation and blocks the security door when violation is detected. Because of this unique 3D technology, the highest accuracy in security access can be reached without reducing the capacity of the entrance.

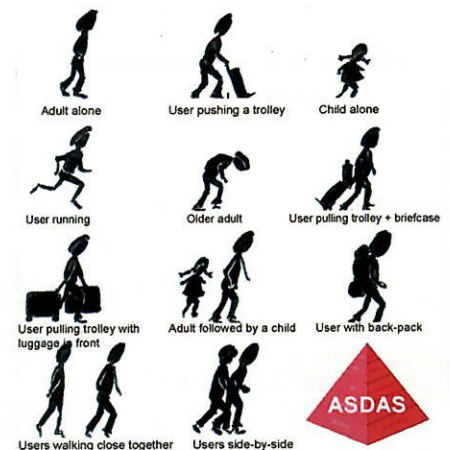
The Tourlock itself is the high security revolving door from Boon Edam. Combining the StereoVision system with this revolving door creates an unmanned high security entrance.

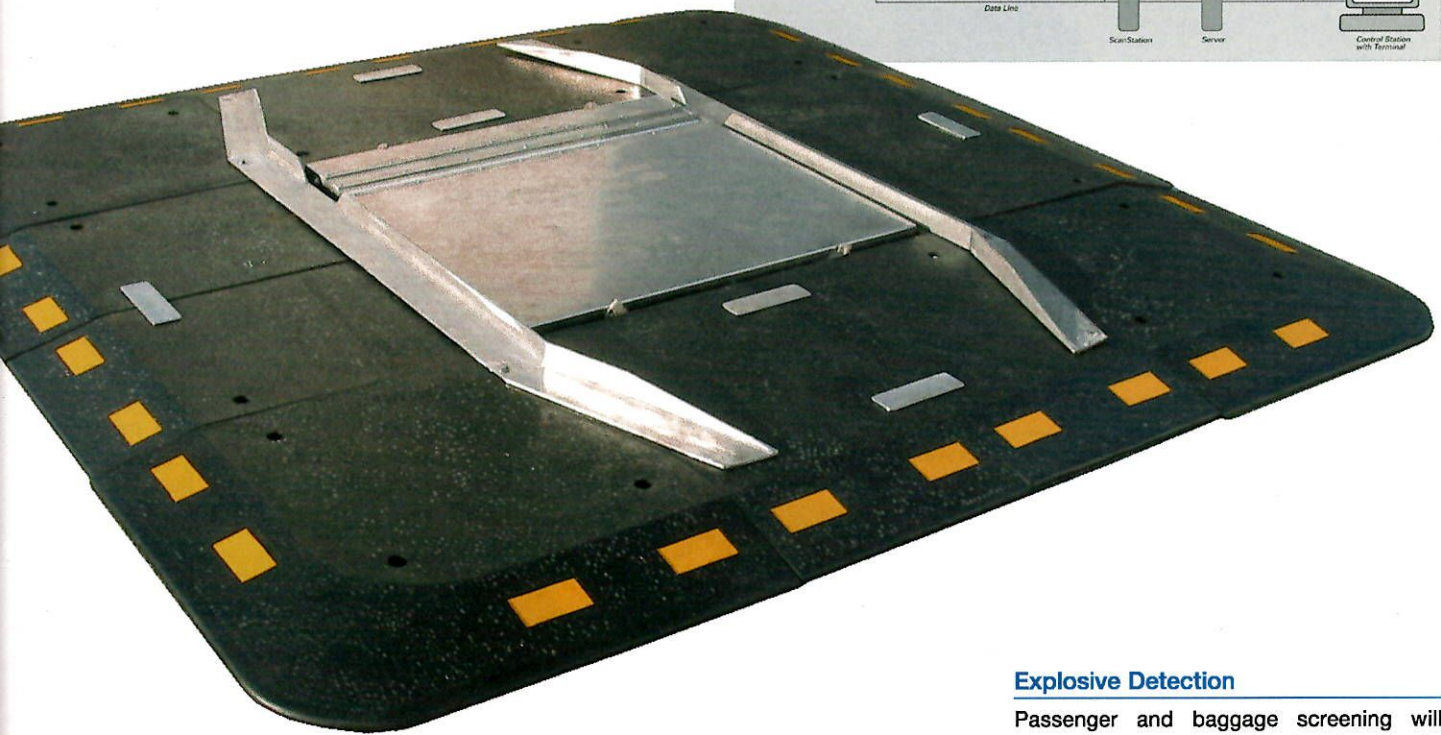
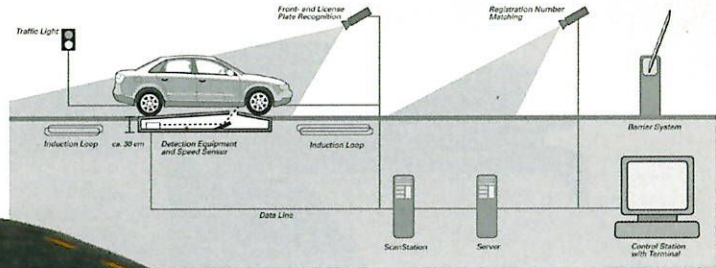
"One-Person-Only" Detection

In a similar vein, Automatic Systems' ASDAS (Automatic Systems Detection and Analysis Solution) "one-person-only" detection system guarantees that each person allowed through a door is fully screened and has the authorisation to go from a free area to a secured one.

Detection of uniqueness is used to determine that there is only one person at a time in the portal and the uniqueness check is carried out at the entry gate.

The ASDAS system mainly makes use of traditional technology (IR cells) and is not sensitive to variables such as temperature, light, and type of flooring. The software algorithm which analyses the data comprises several layers, so that a complete range of uses can be handled with a high level of performance. For example, it can detect





whether the person is accompanied by a small child or if the user is pulling/pushing a trolley.

ASDAS performance is the result of a combination of various sensors and software layers. The first software layer analyses data coming from one sensor. If the profile recognition is not conclusive, the ASDAS algorithm runs a second layer using information from other sensors. And so on as until ASDAS is able to deliver a reliable recognition (low FAR/FRR).

EyeCheck Pupillometer

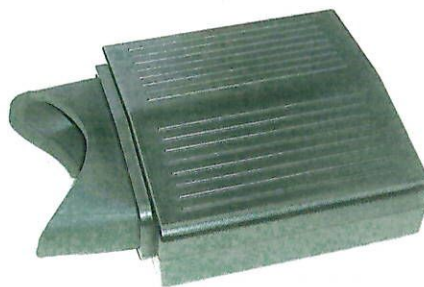
Given the recent press coverage pertaining to incidents of aircrew arriving for work under the influence of alcohol, and the fact that many unruly passenger incidents are alcohol induced, the AAT-EyeCheck pupillometer may find its way to deployment at departure gates. The EyeCheck measures eye pupil response to give rapid and accurate screening of subjects for impairment due to drugs and fatigue. The technique has a well documented and well established medical basis and operator training requirements are minimal.

The technique is readily accepted by subjects, as no physical samples are required.

Examples of routine or special use of AAT-EyeCheck include:

- screening of on-duty safety and security personnel,
- screening of passengers or persons acting strangely,
- screening of drivers or operators of safety equipment
- screening of external personnel at Gates
- random testing

EyeCheck technology will significantly improve safety and security in the workplace, without invading an individual's rights. The accurate detection of drugs and fatigue will provide many additional workplace, safety and security benefits. Nowhere is this more true than within the aviation industry.



Explosive Detection

Passenger and baggage screening will forever be central to an airport's security infrastructure. Nomadics is developing what some consider a leading candidate for next generation explosive detection.

The technology is based on an engineered polymer in a molecular wire configuration. The polymer fluoresces when illuminated. It is designed to stop fluorescing in the presence of explosive molecules. The molecular wire configuration generates a substantial amplification of the binding event between the explosive molecules and the polymer, thus making the device several orders of magnitude more sensitive than chemical sensing devices currently deployed in airports (i.e. IMS based systems). Nomadics call it Amplifying Florescent Polymer (AFP) technology.

The platform sensing material (AFP) was first developed at MIT by Prof. Tim Swagger. Nomadics has exclusively licensed the technology, continues to conduct research on the polymer and has built a series of successful devices around it. The Transportation Security Administration is currently funding AFP-based research under Manhattan II with an eye towards next generation civil aviation security. The US Air Force is actively evaluating it for military cargo screening. The current incarnation of the device is call "Fido"; the US Marines have used it in Iraq over the last several months with encouraging results.

Innovation

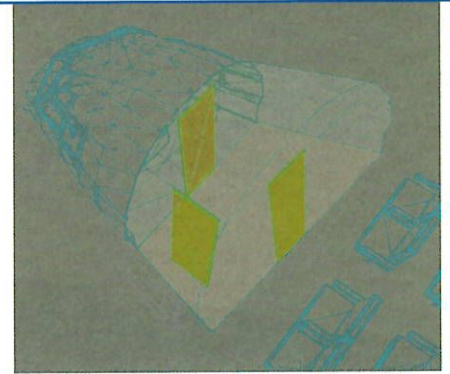
Advanced Automated Security Systems, LLC. (AASC) is a private limited liability corporation, set to research, design, and service security related access control systems. It brings to the global market, two patent approved systems that are technologically unique, as well as being the sole-source provider for these security products. One is for airline use, the other for airport

Cockpit Security

Aircraft Security System, better known as the

ACSS, is a security system that interposes a secondary bullet/bomb rated transparent or semi-transparent security door between the cockpit and the passenger cabin, creating a security chamber.

The security chamber has doors to both the cockpit and the cabin. The cabin door must be closed when the cockpit door is opened and vice-versa, thereby providing a secure door at all times for the safety and the security of the flight deck crew. All doors are closed and locked when sensors indicate unauthorised entry into the security chamber providing a method for temporarily isolating

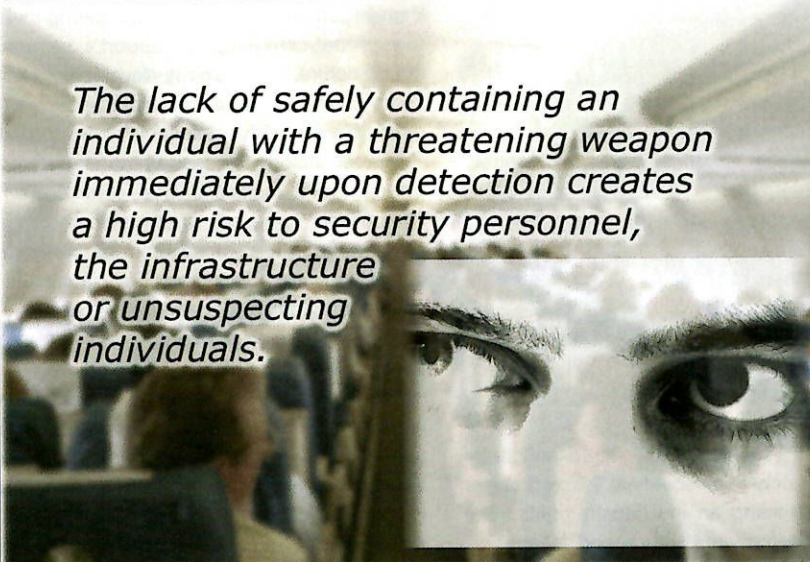


and detaining a hijacker.

In the past the cockpit has been separated from the cabin by a single breachable door. Reinforcing the cockpit doors alone does not prevent intrusion of an assailant; unwanted access may still be achieved when the doors are voluntarily opened by a pilot to utilise the toilets, have food brought into them or to investigate a disturbance in the cabin. Construction materials for doors, walls and ceilings are bullet-proof fabrics, bullet-proof plastics and/or bullet-proof glass.

Great strides have been made in the detection of explosives, biological and chemical weapons.

The lack of safely containing an individual with a threatening weapon immediately upon detection creates a high risk to security personnel, the infrastructure or unsuspecting individuals.



Advanced Automated Security Systems, LLC.

Mechanicsburg, Pennsylvania 17055
 Woodbury, Connecticut 06798
 (203) 263-6670
 webmaster@aassusa.com
 www.aass.us



Queue Security

On the ground, the Automated Security Chamber for Queues (ASCQ) is AASC's patent approved, integrated security screening system which provides a safer monitoring process that protects both security personnel and passengers in a queue.

ASCQ provides a series of adjacent bullet/bomb rated transparent chambers with automatic and manual door controls. This allows the security personnel to detain a suspected individual within the chamber. ASCQ eliminates "Run Through" security breaches, and eliminates the advancement of a suicide bomb from entering a secured area. ASCQ will also act as a temporary containment chamber should a bio-hazard or chemical agent be detected.

With manual side access doors, the suspected individuals can be removed from the chamber into a secure area for further inspection or interrogation, allowing the other passengers in line to continue, reducing waiting time and delays. A conveyer for the inspection of hand carried articles operates intermittently. It automatically starts when the queue advances persons from one chamber to the next and then is automatically stopped until another advance takes place. This allows security personnel to accurately match up passengers with their hand carried articles at the end of the screening process. The use of transparent materials not only permits the observation of possible criminal activity but prevents undue anxiety of individuals in the security chamber. All very futuristic...



Blast Suppression

For all the detection capability at airports, blast containment of suspect devices has often been the poor relation.

Cintec International Ltd has developed a range of water inflated, rapidly deployable blast suppression devices known as the Waterwall™ system. These are designed to isolate or shield suspicious objects in order to protect both people and infrastructure. Their rapid deployment can also lessen the inevitable disruption caused in dealing with such an incident whether it proves to be a genuine threat or a false alarm.

Extensive research and development has demonstrated the exceptional qualities of Waterwall



in mitigating the effects of blast. Pressures behind the blast wave are substantially reduced, heat is absorbed and fragmentation is either eliminated or is significantly decreased. It packs away small for easy storage and with water readily available, it is easily inflated where and when necessary.

This new Waterwall technology is generating interest from those involved with the security management of airports; the police, private security guards, customs control and bomb squads. The Waterwall range comes in various designs to suite to suit different scenarios:-

The Suspicious Object Isolator (SOI) is designed to isolate potentially explosive devices as may be found at baggage control, or unattended cases within an airport terminal. When required, it is first inflated with air to provide stability, and then filled with water through a fire-hose; the water displaces the air through a series of pressure relief valves. Each unit is open at the top and bottom to facilitate deployment and for access to and inspection of the suspect object. In the event of a hoax device or redeployment elsewhere, the water can be pumped out and the bomb bin deflated.

Externally, the airport terminal can be protected by a 3 metre high Waterwall, providing a formidable barrier protecting people and buildings from the effects of a car bomb or similar device.

The Cargo Isolation System (CIS), which is soon to be tested by Qantas in Australia, is designed to isolate suspicious cargo when necessary.

All of the products in the Waterwall range can be supplemented with the addition of appropriate chemicals necessary to treat CBR devices.

Colour under vehicle surveillance system



BDL Systems Ltd Colour Under Vehicle Surveillance System (CUVSS) has been deployed in 21 countries offering enhanced security protection for many applications. It provides the user with a detailed high resolution colour image of the underside of cars, vans, lorries and other vehicular transport. The system is manufactured in both static and mobile configurations.

BDL Systems Ltd
Blackhill Road, Holton Heath
Poole, Dorset UK

T +44 (0) 1202 628155
F +44 (0) 1202 620182

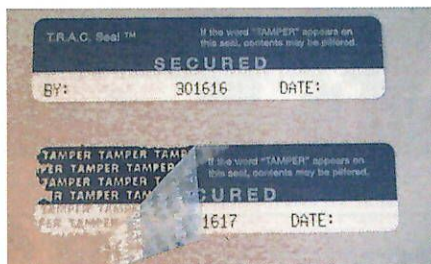
www.bdlsystems.com
sales@bdlsystems.com



Seals

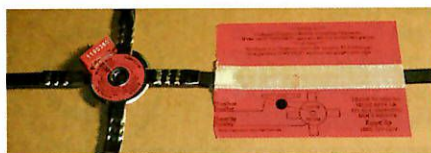
Speaking of cargo, and other shipments, the airline industry has a few special needs issues for door sealing and for cargo. One of the companies active in this field is CGM, who manufacture seals for five of the largest US airlines.

CGM's seals can leave a residue or not as the case may be; their special aircraft skin adhesive rubs off without the need to clean it with solvents. They also manufacture a product called Secure ID which leaves no residue at all.



Seals are simple yet effective means of saving time and money by avoiding the need for inspecting aircraft left to overnight in unsecured airports, as well as in areas with lower security standards. They are also frequently used on private jets which eliminate the need for overnight guards. These seals are quite inexpensive and easy to apply and to account for as the expired seal can still be put on a form showing that the pilot did remove them and thereby documented the inspection process.

CGM's pallet bag is designed for both conventional pallets and for air pallets. Once cargo is inspected it needs to be contained. Shippers can either use CGM's security tape for that purpose or, if bundling becomes more cost effective, then a pallet bag can contain the entire contents of an igloo or air pallet thereby securing it after X-ray and during storage or unattended movement from point to point. The topp clip is used as an auditable method of sealing the strapping both on igloos and on air pallets.



PTZ Camera and Surveillance Solution

In the post-911 era, many airports and airlines have made wider use of CCTV systems to help ensure the security of passengers. However, these systems may not be able to serve the purpose at times when they are most needed.

Common CCTV cameras and housings are breakable by force, not to mention by gunshot, and can be easily identified as being CCTV cameras. Many a criminal has demolished the CCTV camera, which exposes them and affects their chances of success, as the first step in their assault process. Although there are explosive-proof or ballistic-tolerant camera housings available, most are designed for use in industrial environments. These housings are usually huge in size and extremely expensive.

Pinpointing these problems, Controlled Image from UK has designed the CI300 series of camera that is particularly suitable for use in ports and airports, as well as in cockpits of airplanes. The CI300 features a revolutionary and smart design that combines the versatility of speed domes and robust housings features, while avoiding their fragility, bulk and high price disadvantages.

Controlled Image CI 300 camera is compact, integrated with continuous pan (360 degrees) and tilt (270 degrees). This camera outstation has optional 18:1, 25:1 and 27:1 zoom capability that allow the system to see virtually any point adjacent to the camera to more than 70 meters away in all directions. Highly versatile and allows pan and tilt speed

from 0.9 degrees per second to 90 degrees per second. The CI300 also supports pre-set positions and tours. Remote alarm interface offers maximum versatility.

The total waterproof feature of the CI 300 camera make it suitable for outdoor installations at airports where fog, rain and high humidity has often been a barrier to effective CCTV technology.

Apart from its robust nature, the elegant external design of the camera lends itself to the modern airport terminal fashion-conscious needs.

Nowadays, some airlines have also installed CCTV cameras on board to enable passengers to view the external scenery during flight. The CI 300 is also ideal for such application as it can be installed upright or inverted and made to discreetly blend in with its location.

Conclusion

The products featured in this article are just examples of many of the new technologies being developed. There are numerous others. Some, like terahertz technology and millimetre wave imaging, we have already covered in other articles; others will be the subject of editorial coverage in their own right in the months and years to come. One thing is for sure, we have moved along way from airports that were protected by simple razor mesh fences and where passengers and their baggage were screened with metal detection technology and X-ray machines...