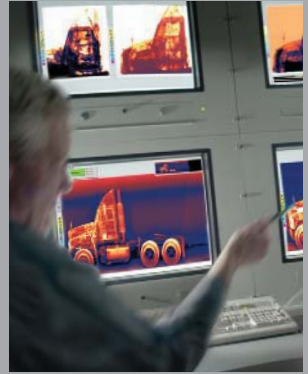


# AS&E®

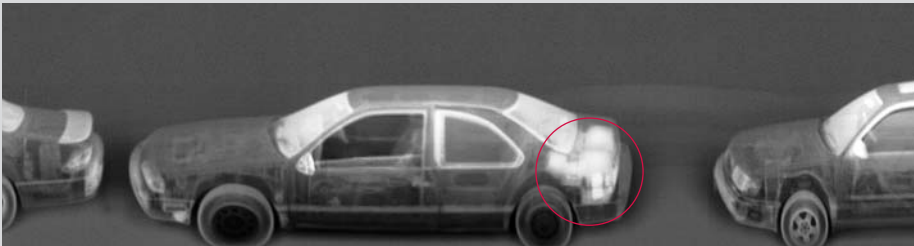
## X-RAY DETECTION SYSTEMS



## AS&E X-RAY INSPECTION SYSTEMS

AS&E X-ray inspection systems are used by governments and corporations around the world to combat terrorism, drug and weapons smuggling, illegal immigration, and trade fraud.

AS&E specializes in detection technologies that can uncover dangerous and elusive threats, including explosives, plastic and metal weapons, and radioactive devices, such as dirty bombs and nuclear WMD. These X-ray systems are deployed worldwide at ports and borders, and military and high-threat facilities. Our signature technology, Z Backscatter™, gives our systems unparalleled detection capabilities, making it the technology of choice when the highest levels of security are required.



This X-ray image produced by the Z Backscatter Van (ZBV) reveals explosives hidden in the trunk of a car (*circled in red*). The ZBV's continuous screening capability allows security officials to covertly and quickly scan lines of vehicles. (See page 6 for more about the Z Backscatter Van.)



## **OMNIVIEW™ GANTRY** **HIGH-ENERGY CARGO AND VEHICLE INSPECTION SYSTEM**

The only relocatable, high-energy system available with multi-view capability — three-sided Z Backscatter imaging, combined with high-energy transmission for dense cargo.

**PAGE 2**



## **Z PORTAL™** **DRIVE-THROUGH CARGO AND VEHICLE SCREENING SYSTEM**

The most comprehensive drive-through screening system available today for detecting explosives, drugs, or stowaways with three-sided Z Backscatter imaging of the scanned vehicle.

**PAGE 4**



## **Z BACKSCATTER VAN™** **MOBILE CARGO AND VEHICLE SCREENING SYSTEM**

The number-one selling mobile X-ray inspection system on the market, the ZBV highlights organic threats and contraband that other systems miss — explosives, drugs, and smuggled cigarettes.

**PAGE 6**



## **GEMINI™** **PARCEL AND BAGGAGE INSPECTION SYSTEM**

Superior threat detection with true multi-technology inspection that combines dual-energy transmission and Z Backscatter X-ray technology.

**PAGE 8**



## **SMARTCHECK™** **PERSONNEL SCREENING SYSTEM**

Comprehensive personnel X-ray screening system that clearly displays all types of threats and contraband concealed on a person, while ensuring their safety and privacy.

**PAGE 10**

## OMNIVIEW™ GANTRY

### Multi-View, High-Energy Cargo and Vehicle Inspection System (Relocatable)

The revolutionary OmniView™ Gantry system is the only multi-view relocatable system available today that combines 6 MeV high-energy transmission inspection plus three ZBackscatter X-ray views for left, right, and top-side imaging of cargo. The combination of technologies delivers the most reliable means of detecting trade fraud, contraband, and threatening materials such as weapons and explosives hidden in cargo containers, tankers, and large vehicles. OmniView Gantry provides high penetration into inspected objects — up to 14 inches (350 mm) of steel — yet the system does not require an exterior building or heavy shielding. All images are displayed on high-resolution monitors.

The OmniView Gantry system operates by moving on rails past stationary vehicles and cargo. The system is bi-directional allowing for a high throughput of two trucks per scan, 24 trucks per hour.

#### APPLICATIONS:

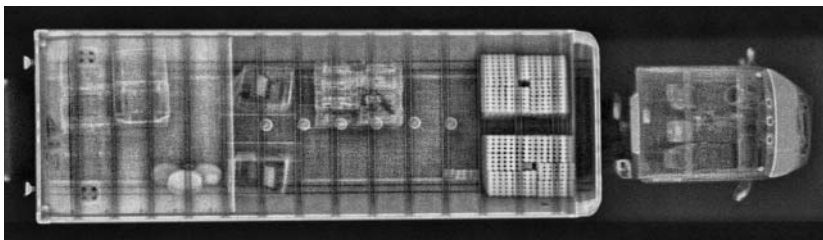
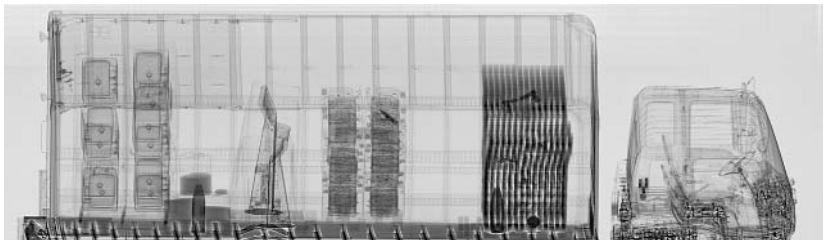
- Cargo and transportation hubs
- Ports and border crossings
- Military security checkpoints



OmniView Gantry System installed



OmniView Gantry X-ray Images



OmniView Gantry provides four views of cargo. High-energy X-rays penetrate dense cargo (*top*); Z Backscatter highlights organic materials, with photo-like images from three sides (*bottom three images*).

## Z PORTAL™

### Multi-View Cargo and Vehicle Screening System (Relocatable)

AS&E's Z Portal™ is a multi-view, drive-through inspection system capable of scanning vehicles and their cargo for concealed threats and contraband. It is available in two sizes — one for large trucks, buses, and cargo vehicles and a smaller size for passenger vehicles. The relocatable screening system can be configured with up to three Z Backscatter X-ray detectors, allowing two side views and a top view of the vehicles under examination. The multiple views provide maximum screening capability and facilitate image interpretation. The Z Portal provides high-quality, photo-like images for outstanding material discrimination capability.

The Z Portal is a high-throughput screening gateway. Driven at a speed of 5 kph, vehicles and their cargo are scanned for threats and contraband, including explosives, drugs, and stowaways. With its compact design and profile, the Z Portal is ideal for high-traffic locations with space constraints and a high-throughput requirement. The system is safe for drivers, operators, cargo, and the environment.

#### APPLICATIONS:

- Ports and border crossings
- Airports
- Security checkpoints
- High-security facilities

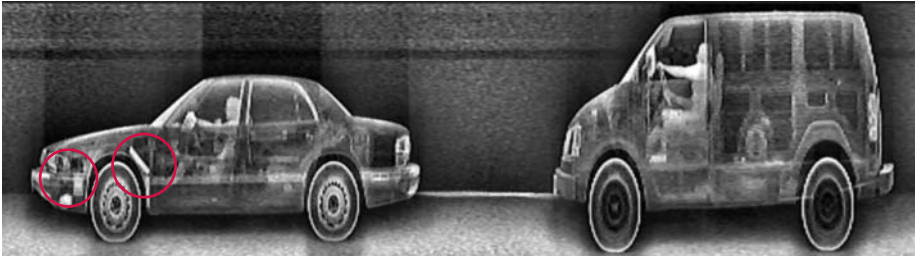


Z Portal for passenger vehicles

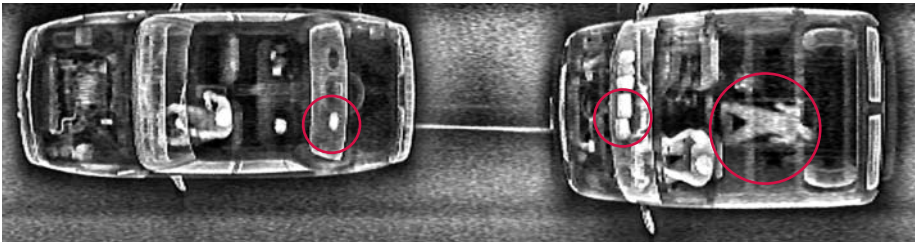


## Z Portal X-ray Images

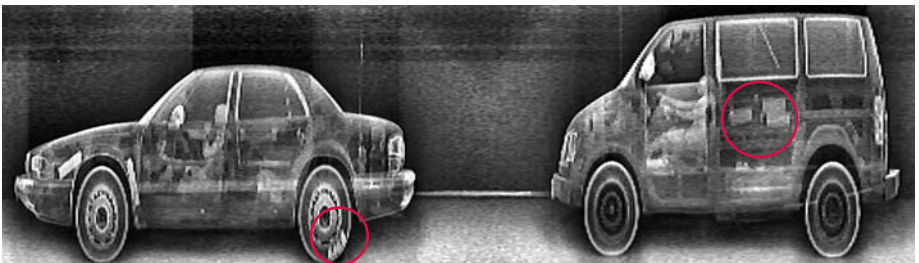
Three-sided Z Backscatter provides material discrimination and high-quality, photo-like images that highlight organic materials such as explosives, drugs, and other contraband (*circled in red*).



Left-side view reveals plastic explosives in the car's wheel well.



Top-down view reveals drugs in the car's speaker system and drugs in the van's dashboard and a stowaway in a hidden floor compartment.



Right-side view reveals drugs in the car's tire and cigarette cartons in the van's door panel.

## Z BACKSCATTER VAN™

### Z Backscatter Cargo and Vehicle Screening System (Mobile)

A breakthrough in X-ray detection technology, AS&E's Z Backscatter Van™ (ZBV™) is a low-cost, extremely maneuverable screening system built into a commercially available delivery van. The ZBV uses proprietary Z Backscatter™ technology to highlight organic threats and contraband that other systems miss, such as explosives, smuggled cigarettes, and drugs. The ZBV allows for immediate deployment in response to security threats, and can scan a vehicle or object in as little as 15 seconds. As the ZBV drives by a suspect object, an X-ray image appears on the operator's console — in real time.

The ZBV is a Z Backscatter-only system that does not require a detector on the far side of the scanned object, making it highly maneuverable and flexible. It can be operated covertly, since it maintains the outward appearance of an ordinary van. With the operator controls mounted in the center of the ZBV's cab, the system can be operated by one or two people simply by swiveling the computer towards the driver's or passenger's side.

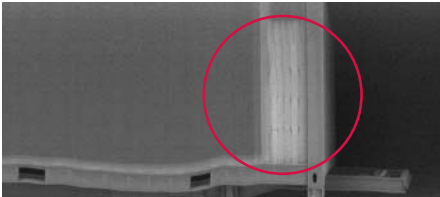
The ZBV is ideal for counterterrorism applications, as it can find dirty bombs and nuclear WMD during the X-ray screening process, utilizing its Radioactive Threat Detection (RTD) option.

#### APPLICATIONS:

- Air and seaports
- Checkpoints and border crossings
- Customs screening at cargo and transportation hubs
- Urban surveillance
- Protection of military forces



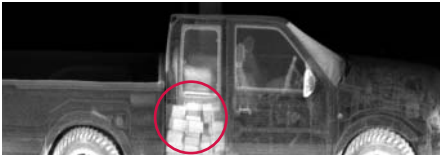
## Z Backscatter Van X-ray Images



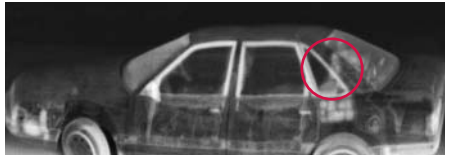
A ZBV scan revealed a false wall in a cargo container which contained 2000 pounds of marijuana.



This ZBV image revealed a stowaway in a hidden compartment of a trailer.



The ZBV detected organic objects in the body of this pickup truck — a significant amount of heroin.



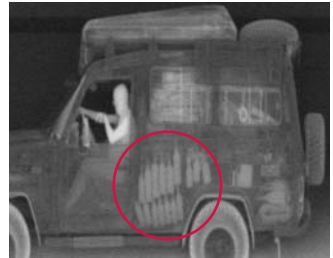
At a border crossing, officials using the ZBV discovered smuggled cigarettes.



This Z Backscatter image reveals explosives hidden in the trunk of a car (circled in red). The ZBV's continuous screening capability allows security officials to quickly scan unattended lines of vehicles.



Attempted human smuggling was revealed using the ZBV's safe Z Backscatter technology.



This Z Backscatter image uncovered alcohol hidden in the back of an SUV.

## GEMINI™

### Parcel Inspection System

AS&E's ground-breaking Gemini system provides the most comprehensive threat detection available for mail, parcel, and baggage screening. Gemini offers the unique capability to simultaneously detect both metallic and non-metallic threats — even in cluttered environments. The system features a combination of dual-energy transmission and Z Backscatter X-rays: two complementary, advanced, and commercially-proven technologies.

Gemini's dual-energy transmission X-rays generate a colorized, high resolution image, easily detecting metallic threats such as guns and knives and fine details including tiny wires which could indicate an IED. Dual-energy also provides organic and metallic discrimination in uncluttered environments. Gemini's Z Backscatter X-rays generate an image that provides enhanced detection of organic materials such as explosives (including sheet and liquid explosives), drugs, and plastic weapons. Together, Gemini's two technologies provide the most information available about the contents of a parcel.

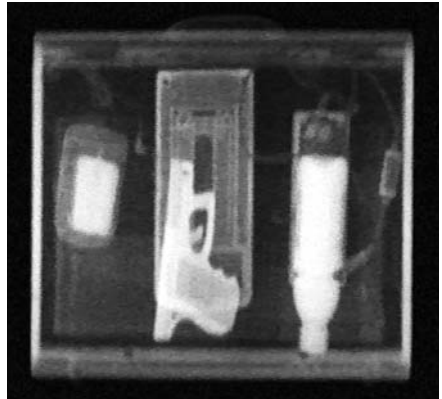
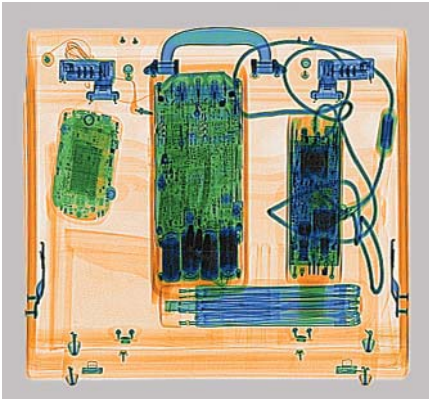
#### APPLICATIONS:

- High-threat facilities
- Airports
- Building lobbies
- Mail rooms
- Security checkpoints
- Correctional facilities
- Customs checkpoints

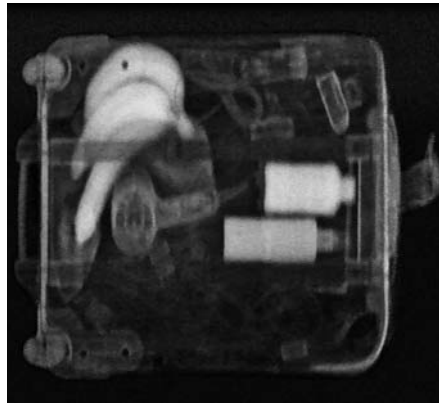
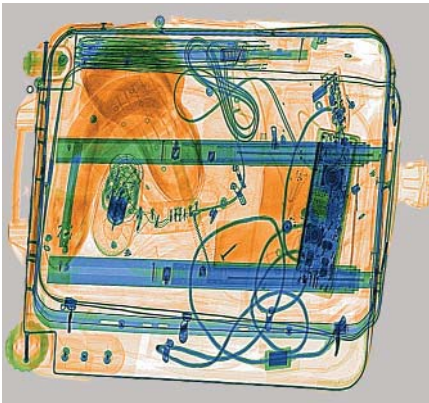


The electronic clutter in the dual-energy transmission image (*left monitor*) obstructs views of the threats in the briefcase. The Z Backscatter image (*right monitor*) of the same briefcase exposes the Glock handgun and plastic and liquid explosives.

Gemini X-ray Images



The dual-energy transmission image (*left*) shows common items in a suitcase: PDA, electronics, and a laptop power cord. The Z Backscatter image of the same suitcase (*right*) reveals the Glock handgun and plastic and liquid explosives hidden among the clutter.



The electronic clutter in the dual-energy transmission image (*left*) shows organic objects, but obstructs any obvious threats. The Z Backscatter image (*right*) of the same suitcase differentiates the organic objects — bananas and concealed liquid explosives.

## SMARTCHECK™

### Personnel Screening System

AS&E's SmartCheck™ system safely and quickly screens people for all types of contraband hidden under clothing, while ensuring privacy. Designed to replace intrusive and time-consuming pat down searches, SmartCheck displays metallic and non-metallic threats and contraband, such as drugs, guns, ceramic and metal knives, as well as plastic and liquid explosives and IEDs. The image generated provides the operator with valuable information as to the size, shape,<sup>o</sup> and location of the contraband or threat.

SmartCheck features a privacy filter to protect the privacy of screened persons and still effectively reveal threats. The privacy filter uses a software algorithm, quickly and reliably presenting only outlines of the scanned individual and any potential threats on the body. The SmartCheck system is safe for all individuals and complies with all applicable U.S. personnel scanning regulations, including the American National Standards Institute (ANSI) standard.

#### APPLICATIONS:

- Airports
- Correctional facilities
- Customs inspection
- Government and private-sector facilities
- Protection of military forces
- Security checkpoints
- Work-release program facilities



SmartCheck screens a passenger

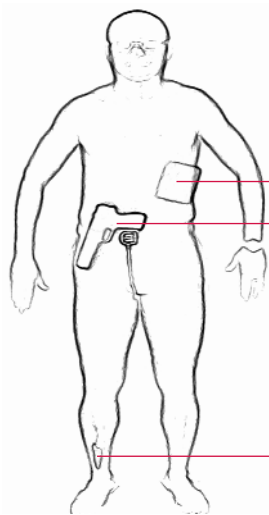
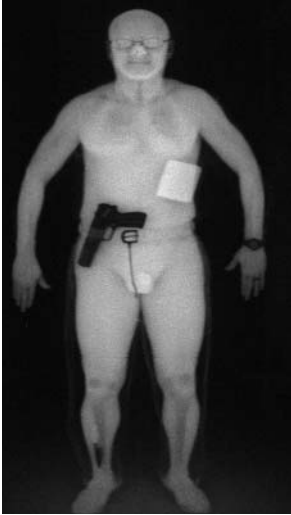


SmartCheck remote console



Operator viewing remote console

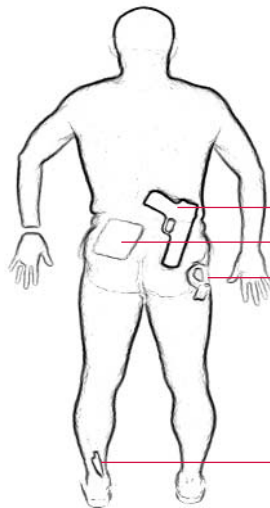
SmartCheck X-ray Images



Plastic explosive  
Handgun

Ceramic knife

SmartCheck X-ray image (left); Privacy-enhanced image (right)



Handgun  
Plastic explosive  
Detonating device and wires for IED

Ceramic knife

SmartCheck X-ray image (left); Privacy-enhanced image (right)

## FORWARDSCATTER X-RAY TECHNOLOGY

### Option for ZBV, Z Portal, and RDIM

AS&E offers Forwardscatter™ technology to complement AS&E's patented Z Backscatter™ technology. Forwardscatter presents a second scatter perspective that displays dense regions of scanned vehicles. This unique technology is ideally suited to display dense bulk objects, such as the shielding found around nuclear weapons or other metallic threats.

Forwardscatter detectors are positioned opposite the X-ray source to capture X-rays scattered in the forward direction. The Forwardscatter image is displayed simultaneously with the Z Backscatter image, maintaining the rapid detection capability of Z Backscatter technology. The combination of Z Backscatter plus Forwardscatter provides improved detection capability. And unlike transmission images, Forwardscatter has no bottom cutoff, providing full coverage of scanned vehicles.



ZBV with Forwardscatter deployed



ZBV with Forwardscatter trailer



Forwardscatter X-ray image (*top*) with shielded nuclear threat circled in red; Z Backscatter X-ray image (*bottom*) with organic materials circled in red.

## EXPERIENCED SERVICE, TRAINING, AND SUPPORT

Highly-Skilled Field Service Engineers for Support Worldwide

AS&E is dedicated to providing the best service and training for all of our inspection systems. AS&E's service organization has multiple headquarter facilities and spare parts depots located throughout the world. Our field service team includes program managers, more than fifty highly trained field service engineers, and dedicated expert trainers who understand the unique requirements of our customers. AS&E's maintenance and support services are available 7 days a week, 24 hours a day, 365 days per year.

## CONTACT INFORMATION

Corporate Headquarters:  
American Science and Engineering, Inc.  
829 Middlesex Turnpike  
Billerica, MA 01821 USA

Tel: 978-262-8700

Fax: 978-262-8804

Web: [www.as-e.com](http://www.as-e.com)

U.S. Sales: [sales@as-e.com](mailto:sales@as-e.com)

International Sales: [intlsales@as-e.com](mailto:intlsales@as-e.com)

For more information, please contact an AS&E sales representative.

AS&E is ISO 9001:2000 registered.





AMERICAN SCIENCE AND ENGINEERING, INC.  
829 MIDDLESEX TURNPIKE | BILLERICA, MA 01821 USA  
TEL: 978-262-8700 | FAX: 978-262-8804 | WWW.AS-E.COM

