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## **Summary Tables of Six Commercially Available Entry Control and Contraband Detection Technologies**

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# **Summary Tables of Six Commercially Available Entry Control and Contraband Detection Technologies**

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## **Abstract**

Existing contraband detection and entry control devices such as metal detectors, X-ray machines, and radiation monitors were investigated for their capability to operate in an automated environment. In addition, a limited number of new devices for detection of explosives, chemicals, and biological agents were investigated for their feasibility for inclusion in future physical security systems.

The tables in this document resulted from this investigation, which was part of a conceptual design upgrade for the United States Mints. This summary of commercially available technologies was written to provide a reference for physical security upgrades at other sites.

## **Acknowledgments**

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## Acronyms

CWA	Chemical warfare agent
D	depth or deep
GC	gas chromatograph
H	height
HVAC	heating, air conditioning, and cooling
IMS	ion mobility spectrometer
ITMS	Ion trap mobility spectrometer
LAN	local area network
MS	mass spectrometer
NIJ	National Institute of Justice
PC	personal computer
PCR	polymerase chain reaction
SAW	surface acoustic wave
SNL	Sandia National Laboratories
TIC	toxic industrial chemicals
VAC	volts alternating current
VCR	video cassette recorder
VDC	volts direct current
W	width or wide

# 1 Introduction

Existing contraband detection and entry control devices such as metal detectors, X-ray machines, and radiation monitors were investigated for their ability to operate in an automated environment. In addition, a limited number of new devices for the detection of explosives, chemicals, and biological agents were investigated for their feasibility for inclusion in future physical security systems.

The tables in this document are the result of this investigation and were inputs for a conceptual design upgrade for the United States Mints. This summary of commercially available technologies could be useful as a reference document for physical security upgrades at other sites.

The United States Mints sponsored a project in fiscal year 2005

- 1) to research commercially available entry control technologies and
- 2) to develop a plan for automating the personnel screening process for US Mint facilities, with the emphasis on exit screening for metal objects. (See the References section for information on the conceptual design for the United States Mints.)

The Entry Control and Contraband Detection Department of Sandia National Laboratories performed a survey of commercially available entry control hardware systems. The following tables were produced by this survey for six commercially available entry control technologies:

- 1) Metal Detectors (walk-through)
- 2) X-ray Baggage Screeners
- 3) Radiation Detectors (gamma/gamma-neutron)
- 4) Explosive Detectors (trace)
- 5) Chemical Agent Detectors
- 6) Biological Agent Detectors

The data include the company name, model number, size, weight, power requirements, pass through sizes, and technologies used. Any missing data were not readily available in the literature or web file searches. Emphasis was given to record any specific remote interfaces required in order to automate these technologies.

These tables can be used as a reference for the Center 4100 Technology Bases and for those subject matter experts performing physical security upgrades.

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**Table 1. Metal Detectors**

<b>Company</b>	<b>Model</b>	<b>Technology</b>	<b>Passes NIJ 0601.02 Standard</b>	<b>Remote Interface</b>	<b>Size Footprint Weight</b>	<b>Power Required</b>
<b>L3 Communications</b> (732) 868-0620	<b>PM200</b>	Multi-zone pulse metal detector	No data	Metornet Security Monitoring System (RS-422)	36.2" x 85.7" x 23.4", 138 lb	90-264 VAC
<b>Metorex</b> (609) 406-9000	<b>Metor 120WP</b>	Pulse metal detector	Yes	Remote alarm relay (SPDT)	34.3" W, 85.6" H, 19.9" D, 107 lb	90-264 VAC 24-35 VDC
	<b>Metor 120</b>	Pulse metal detector	Yes	Control unit with cable	34.3" W, 85.7" H, 19.7" D, 88 lb	90-264 VAC 24-35 VDC
	<b>Metor 124</b>	Pulse metal detector	Yes	Control unit with cable	30.3" W, 85.6" H, 19.9" D, 88 lb	90-264 VAC 24-35 VDC
	<b>Metor 150</b>	Pulse metal detector	Yes	Remote Display Unit	34.5" W, 86.7" H, 20.2" D, 101 lb	90-264 VAC 24-35 VDC
	<b>Metor 160</b>	Pulse metal detector	Yes	Remote alarm relay (STDT)	34.25" W, 85.6" H, 19.9" D, 107 lb	90-264 VAC 24-35 VDC
	<b>Metor 200</b>	Pulse metal detector	Yes	Remote control unit, RS-422, remote zone display	36.2" W, 85.7" H, 24.3" D, 112 lb	90-264 VAC 24- 35 VDC
	<b>Metor 200HD</b>	Pulse metal detector	Yes	Handheld remote, RS-422	85.7" H, 36.2" W, 23.4" D, 112 lb	90-264 VAC 24- 35 VDC
	<b>Metor 200HS</b>	Multi-zone pulse metal detector	Yes	Remote control unit, RS-422	85.7" H, 34.3" W, 23.4" D, 110 lb	90-264 VAC 24- 35 VDC
	<b>Metor 200WP</b>	Multi-zone pulse metal detector	Yes	Remote control unit, RS-422	85.7" H, 36.4" W, 23.4" D, 149 lb	90-264 VAC 24- 35 VDC
	<b>Metor 300</b>	Multi-zone pulse metal detector	Yes	Handheld remote	88.1" H, 36.2" W, ?" D, 139 lb	90-264 VAC 24- 35 VDC
	<b>Metor 250</b>	Multi-zone pulse metal detector	Yes	Remote control unit, RS-422	85.7" H, 36.2" W, 23.4" D, 94 lb	90-264 VAC 24-35 VDC

<b>Company</b>	<b>Model</b>	<b>Technology</b>	<b>Passes NIJ 0601.02 Standard</b>	<b>Remote Interface</b>	<b>Size Footprint Weight</b>	<b>Power Required</b>
<b>Ranger</b> (915) 590-4441	<b>Intelliscan Waterproof</b>	18-zone continuous wave metal detector		No data	85.7" H, 36.2" W, 23.4" D, 150 lb	90-264 VAC 24-35 VDC
	<b>Intellimax</b>	18-zone continuous wave metal detector, 4-zone gamma radiation detector, facial recognition	Yes	Alarm relay outputs	87" tall, 35" wide, 29" deep, 150 lb	120 VAC, 220VAC, 35 VDC
	<b>Intelliscan Eighteen Zone, Executive, Portable</b>	18-zone continuous wave metal detector	Yes		35" W, 87" H, 20" D, 140 lb	90-264VAC
	<b>Intelliscan, Six zone</b>	6-zone continuous wave metal detector	Yes	No data	35" W, 87" H, 29" D, 140 lb	90-264VAC
	<b>Intelliscan, Tri-Sector</b>	3-zone continuous wave metal detector				
<b>Garett</b> (800) 234-6151	<b>PD6500i</b>	Multi-zone pulse metal detector	Yes	Solid state switches, desktop remote control optional, control monitor analyzer	35" wide, 87" tall, 23" depth, 143 lb	120 VAC, 220VAC
	<b>Magni-scanner MT5500, CS5000, MS3500</b>	Pulse metal detector				
<b>CEIA</b> (330) 405-3190	<b>Classic</b>	Pulse metal detector	Yes	No	46" wide, 83-3/4" tall, 8-1/4 deep, no weight data	120 VAC, 220VAC
	<b>HIPE-Elliptic</b>	Pulse metal detector	Yes	RS-232 serial, LAN, mechanical lock, international sensitivity programs	42" wide, 88.5" tall, 8" deep, no weight data	120 VAC, 220VAC

Company	Model	Technology	Passes NIJ 0601.02 Standard	Remote Interface	Size Footprint Weight	Power Required
	<b>SMD 600</b>	Pulse metal detector	Yes	RS-232C	31-36"W, 80.25" H, 23.5" D, no weight data	120 VAC, 220VAC
	<b>HI-PE Multizone</b>	Multi-zone pulse metal detector	Yes	RS-232 serial, LAN, mechanical lock, international sensitivity programs	No data	120 VAC, 220VAC
	<b>PM-D2, SMD 600 Multizone</b>	Multi-zone pulse metal detector	Yes	RS-232/RS-248 keypad	No data	120 VAC, 220VAC
	<b>O2PN20</b>	Multi-zone pulse metal detector	Yes	RS-232	32.75" W to 36.75" H, 87.5" tall, 23.5" deep	120 VAC, 220VAC
<b>Federal Labs / Control Screening (973) 276-6161</b>	<b>CheckGate 9000</b>	Pulse metal detector	Yes	Remote relay outputs. Remote Command Center, remote annunciator panel	87" H, 24" D, 35" W, 119 lb	120 VAC, 220VAC
	<b>CheckGate 9000C,8000C</b>	Pulse metal detector	Yes	Remote relay outputs. Remote Command Center	47" W, 90" H, 9" D, 50 lb	120 VAC, 220VAC
	<b>Checkgate 8000 / Supersensitive Model 8001</b>	Pulse metal detector	Yes	Remote relay outputs. Remote Command Center	87" H, 24" D, 35" W, 119 lb	120 VAC, 220VAC
	<b>CHECKGATE® 8091</b>	Pulse metal and metal-free detector	Yes	Remote relay outputs. Remote Command Center	82.75". H 24". D 44". W 200 lb	120 VAC, 220VAC
	<b>Mailscreen™ Model 3005</b>	Metal detector for mail applications	N/A	None	Height: 15.25" Width: 19.5" Depth: 19" Weight: 38 lb	120 VAC/ 220 VAC/ Battery

**Table 2. X-ray Screening**

Smiths Detection, Smiths Heimann (703) 351-5896							
System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
HI-SCAN PS 3010	Dual energy X-ray	Mail room, small hand carried packages	18.7" x 12.8" x 3.9"	14.6" x 11.8" x 3.9"	86 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 6030di	Dual energy X-ray	Mobile X-ray inspection	54.3" x 31.4" x 44.1"	24" x 12.6"	772 lb		
HI-SCAN 6040d	Dual energy X-ray	Briefcases, security entrance.	68" x 31.4" x 46.5"	24.2" x 16.1"	748 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 6040i		Cabin baggage	78.9" x 33.5" x 50.6"	24.2" x 16.1"	882 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor, keyboard
HI-SCAN 6046si	Multi-energy X-ray generator	Upgraded 6040i, large luggage, hand-carry	78.9" x 33.5" x 50.6"	24.2" x 17.9"	882 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 7555i	Dual energy X-ray	Hand-carry	83.5" x 39.2" x 56.8"	29.5" x 21.7"	1279 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 8380-3D		Re-check of baggage, automatic rotation of baggage	116" x 25.5" x 53.1"	31.5" x 31.5"	2094 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN PS 5030-S	Dual energy X-ray	Packages	47.2" x 27" x 25"	20.9" x 12.6"	276 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor

Smiths Detection, Smiths Heimann (703) 351-5896

System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
HI-SCAN 5030si		Compact desktop for mobile and stationary package inspection	47.3" x 27.7" x 28.6"	20.9" x 12.6"	352 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 9075	Dual energy X-ray	Bulky freight, large carton inspection	119.6" x 50.8" x 72.4"	35.4" x 29.9"	1874 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 100100 V		Airport, parcel service for very large packages	141.1" x 50.4" x 76.4"	39.4" x 39.4"	2050 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 100100T		Oversize baggage and freight, heavy freight with low conveyor	141" x 48.6" x 74.8"	39.4" x 39.4"	2050 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 145180	Dual energy X-ray	Warehouse, carriers of palletized item inspection	211" x 84.3" x 90"	56.7" x 66.9"	4189 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 150150-300kV	Dual energy X-ray	Large boxes, parcels, bulk items, and freight	271.6" x 116.9" x 81.5"	60.6" x 59"	13,200 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HI-SCAN 180180-300kV		Bulky freight, large carton inspection, LD-3 airfreight containers	271.1" x 135.2" x 92.5"	70.4" x 71.3"	13,200 lb	230 VAC standard, 110 VAC 60 Hz. Optional	17" color monitor
HCV-Stationary		Fully loaded trucks and containers	Architectural dependent. 53m x 24 m	5 meters			Workstation

**Smiths Detection, Smiths Heimann** (703) 351-5896

System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
HCV-AirCargo		Stationary inspection of airfreight containers	Architectural dependent. 53m x 24 m	5 meters			Workstation
HCV-GANTRY		Inspection of fully loaded trucks and containers		20m x 3.5m x 4.7m		150 kVA	
HCV-Relocatable		Relocatable X-ray system or fully loaded trucks and containers					
HCV-Mobile		Mobile system to inspect loaded trucks & containers					
SCAN Trailer	Dual energy X-ray	Mobile screening system					
SCANVAN IV	Dual energy X-ray	Mobile screening system					
SCAN-MOBILE	Dual energy X-ray	Mobile screening system					
Silhouette Scan Mobile CAB 2000	Dual energy X-ray	Mobile X-ray inspection system for the recognition of goods					
HI-SCAN 10065 EDS, and HI-SCAN 10080 EDS	Dual Energy X-ray, auto-detect system	Checked baggage search					

**XID Corporation** (201) 773-9400

System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
MailSafex	X-ray Fluoroscope	Mail, small package search					
MailScope 500	Fluoroscope						

Control Screening, LLC (973) 276-6161							
System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
DYNAVISION 6550, and	X-ray	Parcel, package, and luggage search					
DYNAVISION 100100	Optional Dual energy X-ray						
MAILGUARD	X-ray	Mail, small package search					
GUARDRAY							

In Vision Technologies, Inc. (510) 739-2400							
System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
CTX 9000 DSi, CTX 5500 DS, and CTX 2500	X-ray, Computed Tomography	Package and luggage search					

LIXI, Inc. (630) 620-4646							
System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
LIXI	X-ray Fluoroscope	Mail, small package search					

MINXRAY, Inc. (847) 564-0323							
System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
ISPS	X-ray	Portable viewing of suspicious packages					
80ST		Image storage panels					

<b>SAIC (800)-430-7629</b>							
<b>System</b>	<b>Technology</b>	<b>Application</b>	<b>Dimensions (LxWxH)</b>	<b>Max. Object Size (LxWxH)</b>	<b>Weight</b>	<b>Power</b>	<b>Remote Interface</b>
<b>RTR-4</b>	Portable X-ray	Portable viewing of suspicious packages					
<b>CDS-2002i</b>	Backscatter Gamma-ray	Handheld contraband detector for use on walls and vehicles					

<b>Rapiscan Security Products (310) 978-1457</b>							
<b>System</b>	<b>Technology</b>	<b>Application</b>	<b>Dimensions (LxWxH)</b>	<b>Max. Object Size (LxWxH)</b>	<b>Weight</b>	<b>Power</b>	<b>Remote Interface</b>
<b>RAPISCAN 515</b>	Dual Energy X-ray	Handcarry, checked baggage	79.4" x 53" x 32.75"	25.2" X 16.9"	1650 lb	115/230 VAC	17" monitor, computer, VCR optional output
<b>RAPISCAN 520B</b>		Handcarry at airports, courthouses, embassies and prisons	101.2" x 53" x 33"	25.2" x 16.93"	1672 lb	110 VAC 10 Amps or 220 VAC 5 Amp	17" monitor, Windows PC, access to keyboard and parallel port. VCR Output option
<b>RAPISCAN 522B</b>		Large handcarry in high traffic areas	109.5" x 58.1" x 41.3"	21.6" x 29.5"	1367 lb	110 VAC 10 Amps or 220 VAC 5 Amp	17" monitor, Windows PC, access to keyboard and parallel port. VCR Output option
<b>RAPISCAN 526</b>		Lobby mail screening, baggage screening	120.1" x 64" x 52.1"	37.4" x 25.6"	1804 lb	110 VAC 10 Amps or 220 VAC 5 Amp	17" monitor, Windows PC, access to keyboard and parallel port. VCR Output option
<b>RAPISCAN 527</b>	Dual Energy X-ray	Checked baggage and small cargo.	155" x 82.3" x 54.6"	39.37" x 39.37"	3630 lb	115/230 VAC	17" monitor, computer, VCR optional output
<b>Secure 1000</b>	Low Dose Backscatter X-ray (3 microREM)	Personnel search, 6 sec front, back, both sides	1.1 sq. m		650 lb	110 or 220 10 Amp	13" color monitor

American Science and Engineering, Inc. (978) 262-8700							
System	Technology	Application	Dimensions (LxWxH)	Max. Object Size (LxWxH)	Weight	Power	Remote Interface
<b>Model 66Z</b>	Z Backscatter X-ray	Mail, packages, and baggage search	67" x 34.25" x 58"	25.5" x 17.25"	1150 lb	No data	Monitor and conveyor controls
<b>Model 101Z</b>	Z Backscatter X-ray	Large package and baggage inspection	83" x 30" x 69"	33" x 32"	1700 lb	No data	Monitor and conveyor controls
<b>Model 101ZZ</b>	Z Backscatter X-ray	Large package and baggage inspection	150" x 56" x 50"	33" x 21"	4000 lb	No data	Monitor and conveyor controls
<b>Model 101XL Pallet Search</b>	Z Backscatter X-ray	Large cartons and palletized cargo inspection	104" x 93" x 115"	64" x unlimited	2500 lb	No data	
<b>Model EXR-ZZ</b>	Z Backscatter X-ray	Package inspection real-time image analysis					
<b>BodySearch</b>	Z Backscatter X-ray	Personnel inspection					
<b>Models 101VAN, MOBILE 101-TRAILER, MobileSearch CargoSearch, ContainerSearch</b>	Z Backscatter X-ray	Mobilized, vehicle, and cargo inspection	219" x 80" x 91"	35" x 41"	8600 lb	No data	
<b>VIVID</b>	Dual Energy X-ray	Package and luggage search					
<b>Models H-1, APS, VIS, VIS-W, and VDS</b>	Computer Enhanced						

**L-3 Communications Security & Detection Systems (781) 939-3800**

<b>System</b>	<b>Technology</b>	<b>Application</b>	<b>Dimensions (LxWxH)</b>	<b>Max. Object Size (LxWxH)</b>	<b>Weight</b>	<b>Power</b>	<b>Remote Interface</b>
<b>Linescan 107</b>	Single energy X-ray	Handcarry X-ray screening	180.2" (conveyor) x 48" x 74.5"	39.8" x 39.8"	3800 lb crated, 3200 lb uncrated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors
<b>LS 110-II</b>	TIP Ready Dual energy X-ray	Handcarry X-ray screening	261.5" (conveyor) x 35.1" x 48.3"	25.5" x 17"	1900 lb crated, 1700 lb uncrated	Nno data	Single 17" color monitor
<b>Linescan 112</b>	Dual energy X-ray	Mid-side X-ray screening, low conveyor	54" x 48.1" x 104.3" (conveyor)	25.6" x 32"	2406 lb crated, 1916 lb crated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors
<b>Linescan 208</b>	No data	Checked baggage, boxes, package X-ray screening	114.5" (conveyor) x 42.3" x 56"	25.7" x 32.5"	2925 lb crated, 2450 lb uncrated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors
<b>Linescan 210</b>	No data	Checked baggage, boxes, package Xray screening	69.3" - 140" (conveyor) x 32.37" x 48"	24" x 18.4"	1600 lb crated, 1300 lb uncrated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors
<b>Linescan 215</b>	No data	Briefcases, handbags, backpacks, small parcel X-ray screening	69.3" - 140" (conveyor) x 32.37" x 48"	24" x 18.4"	1600 lb crated, 1300 lb uncrated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors
<b>Linescan 222</b>	Nno data	Small bags, briefcase, backpack, mail X-ray screening	48" -84.7" x 28.75" x 27.5"	20.5" x 12.9"	961 lb crated, 681 lb uncrated	115-120 VAC 10 Amps, 230-240 VAC 8 Amps	Single 17" color monitor
<b>Linescan 231</b>	No data	Large luggage, parcels, checked baggage X-ray screening	63.1" - 145.5" x 47.2" x 65.3"	39.4" x 31.5"	3074 lb crated, 2500 lb uncrated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors
<b>Linescan 237</b>	No data	Out of gauge luggage, parcels, box X-ray screening	63.2" - 145.5" x 47.5" x 60.6"	39.4" x 31.5"	3100 lb crated, 2700 lb uncrated	115-120 VAC 15 Amps, 230-240 VAC 10 Amps	Dual 17" monitors

<b>L-3 Communications Security &amp; Detection Systems (781) 939-3800</b>							
<b>System</b>	<b>Technology</b>	<b>Application</b>	<b>Dimensions (LxWxH)</b>	<b>Max. Object Size (LxWxH)</b>	<b>Weight</b>	<b>Power</b>	<b>Remote Interface</b>
<b>Linescan 239</b>		Oversize luggage, customs, large luggage X-ray screening	64.9" x 143.7" (conveyor) x 55.6" x 75.7"	47.2" x 39.4"	3235 lb crated, 2885 lb uncrated	115-120 VAC 10 Amps, 230-240 VAC 8 Amps	Dual 17" monitors
<b>eXaminer 3DX 6000</b>	Explosives Detection System (EDS) X-ray, Computed Tomography	Package and luggage search, 500 bags/hr	202" x 81" x 86"	32.5" x ~30"	8500 lb crated, 6700 lb uncrated	208 VAC with required UPS 3 phase 30 Amp	
<b>eXaminer 3DX 6500</b>	Explosives Detection System (EDS) X-ray, Computed Tomography	Package and luggage search, 600 bags/hr		2.54m x 1m			
<b>MVT Automated Multi-view Explosives Detection System</b>	Explosives Detection System (EDS) X-ray, Multi-view Tomography	Package and luggage search, 1800 bags/hr	142.8" x 85.4" x 79"	39.4" x 31.5"	8900 lb crated, 8200 lb uncrated	190/200/208/220/240 /380/400/415/440 50/60 Hz, 7.5 kVA, 3-phase	
<b>MVT-HR Automated Multi-view Explosives Detection System</b>	Explosives Detection System (EDS) X-ray, Multi-view Tomography	Package and Luggage Search, 1800 bags/hr	104.5" x 85" x 79"	98.4" x 39.4" x 31.5"	10,100 lb crated, 9400 lb uncrated	190/200/208/220/240 /380/400/415/440 50/60 Hz, 7.5 kVA, 3-phase	
<b>VIS108 Automated Inline Explosives Detection System</b>	Dual energy inline EDS	Package and Luggage Search, 1800 bags/hr	94.5" x 61.3" x 74.1"	98.4" x 39.4" x 31.5"	4800 lb crated, 4340 lb uncrated	240/230/220/120/110 /100 VAC 3.5 kVA 1-phase	Computer workstation, Ethernet switch, FDDI network protocols
<b>VDS108</b>	Dual energy	Automated Explosives Detection System (EDS)	94.5" x 61.3" x 74.1"	98.4" x 39.4" x 31.5"	4800 lb crated, 4340 lb uncrated	240/230/220/120/110 /100 VAC 5.7 kVA 1-phase	Computer workstation, Ethernet switch, FDDI network protocols

**L-3 Communications Security & Detection Systems (781) 939-3800**

<b>System</b>	<b>Technology</b>	<b>Application</b>	<b>Dimensions (LxWxH)</b>	<b>Max. Object Size (LxWxH)</b>	<b>Weight</b>	<b>Power</b>	<b>Remote Interface</b>
<b>PX-M</b>	1536 diode dual energy X-ray detector	Checkpoint X-ray screening with wide tunnel	88.4" x 51.1" x 30.8"	23.9" x 19.9"	1300 lb crated, 1100 lb uncrated	1-phase 110-240 1.0 kVA	21" color monitor, workstation, Ethernet
<b>APS-II</b>	Dual energy X-ray	Handcarry X-ray screening	100.8" x 34.8" x 56.1"	23.6" x 15.7"	2164 lb crated, 1567 lb uncrated	1-phase 110-240 1.5 kVA	17"/21" optional color monitor

**Table 3. Radiation Detection**

Manufacturer	Model	Controller Size (H,W,D)	Detector Size (H,W,D)	Weight (lb)	Cost	Application	Technology	Remote Interface	Power
<b>Bruker</b> (978) 663-3660						Ship, submarine, vehicle-mounted radiation detection system			
<b>Constellation Technology</b> (800)-335-7355	<b>P3 Portal Monitor</b>					Stand-alone personnel radiation monitor	Plastic scintillation		24 hours on batteries, or 110 VAC
<b>Saint-Gobain Crystals &amp; Detectors</b> (408) 257-3480	<b>{Bicron} TPM-903</b>	SCA-775 (same as TSA Systems)	72" x 3" x 1.5" Overall: 91" x 36.5" x 24"	90 lb	\$11,500	Transportable personnel radiation monitor.	Plastic scintillation		Battery or 90-250 VAC
<b>Soltec Corp.</b> (800) 423-2344	<b>PMP-1</b>	15.7" x 16.5" x 29.1"		33.1 lb		Monitoring gamma radiation in the field	NaI (TI) scintillator 2" diameter x 2"	RS-232, Analog output 1-5VDC	120 VAC, 12 VDC, Internal 10-day Li battery
<b>Thermo Electron Corp.</b> (508)-553-1608	<b>{Bicron} APM Radionuclide Surveillance System</b>	13.8" x 9.8" x 3.9"	24" x 25" x 11"	254 lb		Port of entry, border crossing, airport	NaI (TI) scintillator 3" diameter x 3", He3 neutron detector	Remote alarm unit, PC with modem, local or remote alarm option	95-240 VAC, 50-60 Hz.
	<b>FHT 1372</b>	FHT 6020	26.8" x 17.3" x 11.0"	37.5 lb		Stationary system to monitor personnel, luggage belts, cars, bikers. Options for thermal and fast neutrons.		RS-485, parameters setup with Windows PC via serial port.	100-250 VAC

Manufacturer	Model	Controller Size (H,W,D)	Detector Size (H,W,D)	Weight (lb)	Cost	Application	Technology	Remote Interface	Power
<b>TSA Systems</b> (970) 535-9949	<b>PM-700A</b>	SC-770 Controller or SCA-775	84" x 22" x 8"	400 lb	\$21,000	Personnel portal	Plastic scintillation	Red strobe light, numeric display, RS-232 and Ethernet. Preliminary AM-270 alarm monitor remote unit.	90-250 VAC, 47-63 Hz
	<b>PM-700AGN</b>	SC-770 Controller or SCA-775	84" x 26" x 8"	600 lb	\$36,000	Personnel portal and neutron detection	Plastic scintillation	Red strobe light, numeric display, RS-232 and Ethernet. Preliminary AM-270 alarm monitor remote unit.	90-250 VAC, 47-63 Hz
	<b>PM-702</b>		100" x 48" x 8"	134 lb	\$13,000	Transportable personnel radiation monitor, gamma category II	Plastic scintillation	Audible and visual alarms, RS-232	Battery or 90-250 VAC

**Table 4. Explosives Detection**

<b>Manufacturer</b>	<b>Model</b>	<b>Size (H,W,D)</b>	<b>Weight (lb)</b>	<b>Cost</b>	<b>Technology</b>	<b>Remote Interface</b>	<b>Application</b>	<b>Screening Time (s)</b>	<b>Power</b>
<b>GE Industrial</b> (202) 419-4110	<b>EntryScan3</b>			\$50,000	Ion Trap Mobility Spectrometer (ITMS)	Network compatible	Trace detection of explosives/ narcotics or both.		115/230 VAC
<b>Smiths Detection</b> (908) 222-9100	<b>IONSCAN SENTINEL</b>	74" x 55" x 90"	1775 lb	\$135,000	IMS		Trace detection of explosives and narcotics.	8.57	208/220 VAC 40 Amp, 50 or 60 Hz.
	<b>IONSCAN 400B</b>	15.5" x 13.5" x 13"	47 lb		IMS	None	Benchtop swipe for narcotics and explosives	8.0	115 VAC
	<b>IONSCAN Document Scanner</b>	15.5" x 13.5" x 13"	53 lb		IMS	None	Swab or passport (document) swipe on sample disc.	8	115 VAC
	<b>SABRE 4000</b>	14.5" x 4" x 4.5"	7 lb		Ion Mobility Spectrometer (IMS)	None	Handheld trace detection of explosives, chemical agents. TIC or narcotics	15.0	4-hour battery
	<b>CENTURION</b>	18" x 16" x 11"	31 lb		Ion Mobility Spectrometer (IMS)	LAN or RS-485	Fixed site, HVAC monitoring of CWA and TIC		110/220 VAC

**Table 5. Chemical Agent Detection**

<b>Manufacturer</b>	<b>Model</b>	<b>Size (L x W x H)</b>	<b>Weight</b>	<b>Power</b>	<b>Technology</b>	<b>Application</b>	<b>Remote Interface</b>
<b>Bruker Daltronics</b> (978) 663-3660 x 1308	<b>RAID-XP</b>	6.3" x 8.6 x 9.8"	16 lb w/o batteries	110 VAC, battery pack	IMS	Handheld radiation and chemical agent detection	Integrated into sensor networks
	<b>RAID-M</b>	16" x 4.5" x 6.5"	5 lb	Battery pack, 12-32 V DC / 240 V 50 Hz AC	IMS	Handheld contamination detection of personnel or equipment	RS-232, Conn Unit Ethernet
	<b>RAID-1</b>				IMS	Handheld chemical agent detection	
	<b>RAID-S</b>				IMS	Mounted Trace gas detection for long term operation	Integrated into sensor networks
	<b>MM-1</b>				GC and Mass Spectrometer (MS)	Military Recon vehicles, Mobile Mass Spectrometer	
	<b>MM-2</b>				Quadrupole mass spectrometer	Mobile Mass Spectrometer	Integrated into sensor networks
	<b>RAPID</b>	20" x 13" x 15.2"	63 lb		Fourier Transform Infrared Interferometer	Standoff Detection, mounted on ships, helicopters, etc.	Microsoft Windows Interface
<b>Electronic Sensor Technology</b> (805) 480-1994	<b>zNose Model 4200</b>	6" x 10" x 12"	20 lb	100-260 VAC at 250 Watts max.	Surface acoustic wave (SAW)		PC Anywhere
	<b>zNose Model 7100</b>	14.3" x 7.5" x 14.3"	30 lb	100-260 VAC at 250 Watts max.	SAW and fast GC		PC Anywhere
<b>Naval Sea Systems Command (NAVSEA) / ARMY</b>	<b>Joint Chemical Agent Detector (JCAD)</b>	3" x 2" x 10" estimated	2-5 lb estimated			Small, man portable CW detector	Data analysis unit, JWARN, GCCS

Manufacturer	Model	Size (L x W x H)	Weight	Power	Technology	Application	Remote Interface
<b>Smiths Detection</b> (703) 351-5896	<b>Centurion</b>	18" x 16" x 11"	31 lb	110/220 VAC	IMS	Fixed Location Chemical agents and TIC's	Alarm relay contacts, paging
	<b>Enhanced Chemical Agent Monitor (ECAM)</b>	6" x 6" x 15"	3.75 lb	6v battery (Li/SO2)		Handheld chemical agent detection	
	<b>APD 2000</b>	4" x 3.5" x 11"	6 lb	6 "C" batteries		Handheld chemical agent detection	Optional alarm transmitter and receiver
	<b>SABRE 4000</b>	14.5" x 4" x 4.5"	7 lb	4-hour battery	IMS	Handheld trace particles and vapor of explosives, chemical agent, TIC, narcotics	
	<b>GID-2A</b>	8.5" x 22" x 11.2"	37.5 lb	115 VAC 50-60 Hz.	Twin IMS	Fixed site chemical warfare agent detection	Network Control Units (NCU)
	<b>Chemical Detector GID-3 (24/7)</b>	26.4" x 16.5" x 13.6"	80 lb	115 V (60 Hz) / 230 V (50Hz) AC	IMS	Fixed site chemical warfare agent detection	RS-232 serial alarm box, RS-485, direct wiring of relay alarms.
	<b>HazMatID</b>	18" x 11" x 7"	23 lb	2 hour battery, mains, cigarette lighter	Infrared light spectroscopy	Portable, identifies unknown liquids, powders and solids.	Wireless capability
	<b>LCD-3 - Lightweight Chemical Detector</b>	30 cubic inches	1.2 lb	AA batteries	Enhanced IMS and corona discharge ionization	Local chemical warfare and TIC warning for 1-several soldiers	RS-232 or RS-485, ear piece, or network system
	<b>MCAD - Man portable Chemical Agent Detector</b>				Ion Mobility Spectrometer (IMS)	Portable CW, TIC detection	

Manufacturer	Model	Size (L x W x H)	Weight	Power	Technology	Application	Remote Interface
	<b>NBCerberus - Mobile NBC Detection System</b>	4' x 4' x 7'	1/2 ton estimated		Multiple technologies	Truck/van/trailer portable nuclear, biologic, chemical detection station for large public events	Central coordinating facility via radio, microwave, hard wire or fiber cable.
<b>RAE Systems</b> (408) 752-0723	<b>MiniRAE 2000</b>	8.2" x 3.0" x 2.0"	2 lb	NiMH battery, wall adapter	Photo ionization Detector (PID)	Portable handheld volatile organic compounds monitor	RS-232
<b>Proengin (France)</b> (954) 760 9990	<b>AP2C</b>	18.1" x 7.1" x 4.7"	4.4 lb	S4PE battery, DC adapter option	Flame Photo Spectrometer (FPS)	Handheld portable detection of nerve and blister agents	Remote alarm optional (APACC), RS-232 encrypted data stream (not a preferred method)
	<b>ADLIF</b>	16.1" x 19.3" x 33.5"	100 lb	Electrical power box (CSE)	Flame Photo Spectrometer (FPS)	Fixed detection of nerve and blister agents	Chemical Alarm Signaling Box (CSC)
<b>Constellation Technology Corporation</b> (800)-335-7355	<b>CT-1128 Portable GC-MS</b>	15" x 23" x 15"	75 lb	110 VAC	Gas Chromatograph-Quadrupole Mass Spectrometer (GC-MS) analysis	Fixed detection of chemical agents	No data

**Table 6. Biological Agent Detection**

<b>Manufacturer</b>	<b>Model</b>	<b>Size (H,W,D)</b>	<b>Weight (lb)</b>	<b>Power</b>	<b>Cost</b>	<b>Technology</b>	<b>Remote Interface</b>	<b>Response Time</b>	<b>Ready Time</b>	<b>Duty Time</b>
<b>Alexeter Technologies</b> (877) 591-5571	<b>Guardian Reader</b>			Swab test kit for visible powders		Antibody, presence or absence of protein in a sample		5 to 30 minutes		1 year shelf life
<b>Bruker Daltronics</b> (978) 663-3660 x 1308	<b>APSYS</b>					Polymerase chain reaction (PCR)		3 minutes		
	<b>CBMS</b>					Aerosol concentration, pyrolysis, then Ion Trap Mass Spectrometer	Integratable into sensor networks	3 minutes	20 minutes	
<b>Fibertek Inc</b> (703)-471-7671	<b>Short Range Biological Standoff Detection System (SRBSDS)</b>		100's-1000's	No data	No data	Laser induced fluorescence (LIF)	No data	No data	No data	No data
<b>LLNL</b> (925) 422-5615 Richard Langlois	<b>APDS</b>					Immunoassay detection, then nucleic-acid amplification		1 hour		
<b>Sceptor Industries, Inc.</b> (888)-450-4321	<b>SpinCon® Advanced Air Sampler</b>	18" x 15" x 8"	46	120 VAC or 12/24 VDC						
<b>Smiths Detection</b> (410) 510 9385	<b>APD 2000</b>	4" x 3 1/2" x 11"	6	6 internal alkaline "C"	\$9,600.00					
	<b>BioCapture™ Air Sampler</b>									

Manufacturer	Model	Size (H,W,D)	Weight (lb)	Power	Cost	Technology	Remote Interface	Response Time	Ready Time	Duty Time
	<b>Bio-Detector</b>	55.9 cm x 60.7 cm x 45.7 cm		110 VAC (50-60 Hz) or 28 VDC		Immuno-ligand assay chemistries with a light-addressable potentiometric sensor (LAPS)		15 minutes	32 minutes	14 hours continuous operation, 40 detection requests
	<b>Bio-Seeq</b>	11" x 3.5" x 7"	7	External 12VDC, Internal Batteries, Vehicle power		Polymerase Chain Reaction (PCR)	RS-232E compatible with ACMS RF systems	20 minutes		
	<b>CBMS</b>					Mass Spectrometer		4 minutes		
	<b>Bio-Seeq Mail Sentry</b>	69" W x 32" D x 88" H		Dedicated 120 VAC 20 amp circuit		Polymerase chain reaction (PCR)	Telephone line for paging			
<b>Proengin</b> (France) (954) 760 9990	<b>Biologic Alarm Monitor (MAB)</b>	11.8" x 6.3" x 17.7"	17 lb	9-32 V DC		Flame photo spectrometry (FPS)	RS-485	< 1 minute		10 days (hydrogen cylinder)

## 2 References

Hunter, John A, Carlson, Dennis Lee, *U.S. Mints Automated Screening of Exit and Entry Points*, Official Use Only, Sandia National Laboratories, Albuquerque, NM, May 2005.

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