

DTRA's Support to the Explosive Ordnance Disposal (EOD) Community

29 April 2010

***Emerald Coast Conference Center
Fort Walton Beach, FL***



Making the world safer



Agenda

- What and who is DTRA?
 - Cooperative Threat Reduction (CTR)
 - Small Arms & Light Weapons (SALW)
- Improvised Explosive Devices (IEDs)
- IED Attack and Defeat Cycles
- The IED Threat: Persistent and Evolving
- Commonalities & Differences between High Explosive (HE) and Chemical, Biological, Radiological, and Nuclear (CBRN) type devices
- How DTRA Become Involved with IEDs
- DTRA Support to the EOD Community
- DTRA's Ongoing IED related R&D technology projects



Defense Threat Reduction Agency

DTRA

The Defense Threat Reduction Agency (DTRA) is a combat support agency of the U.S. Department of Defense (DoD). Founded in 1998, the agency headquarters is located in Fort Belvoir, Virginia. DTRA employs 2,000 men and women, both military and civilian, at more than 14 locations around the world.

DTRA's Mission

To safeguard the United States and its allies from weapons of mass destruction (WMD) (chemical, biological, radiological, nuclear and high-yield explosives (CBRNE)) by providing capabilities to reduce, eliminate, and counter the threat and mitigate its effects.



Cooperative Threat Reduction (CTR)

CTR's non-proliferation effort reaches across the European, Central, and Pacific Commands' AORs – and may possibly expand to other Commands – to eliminate, secure and interdict nuclear, chemical and biological materials that could be used against the United States, its partners, allies, and friends.



OSD Policy establishes guidance and coordinates necessary agreements for all CTR activities.

DTRA is the implementing agent; responsible for all aspects of program, contract, and funding management.



CTR Program Areas

- Strategic Offensive Arms Elimination



- Nuclear Weapons Safety & Security

- Biological Threat Reduction Program



- WMD Proliferation Prevention

- Chemical Weapons Elimination





Small Arms & Light Weapons

- Small arms: weapons designed for personal use:
 - Revolvers, rifles, sub-machine guns, assault rifles, LMGs
- Light weapons: designated for use by several persons serving as a crew:
 - Mortars (< 100mm), crew served MGs, Man-Portable Air Defense Systems (MANPADS), recoilless rifles, crew-served grenade launchers, man-portable rocket/missile systems/anti-tank guns
- Ammunition and Explosives:
 - Small Arms Ammunition (for small arms), shells and missiles for light weapons, all grenades, landmines, explosives





What is an IED?

- IED: An explosive device used in an unconventional manner by terrorist, guerrilla, criminal, or commando forces
 - Design: from crude to very sophisticated
 - CAN include explosive material OR chemical, biological or radiological payloads
 - Only limited by the imagination of the builder
 - Size, shape, container, lethality, initiators/triggers



Radio Controlled IED



Suicide Bomber Vest



Improvised Rocket Launcher

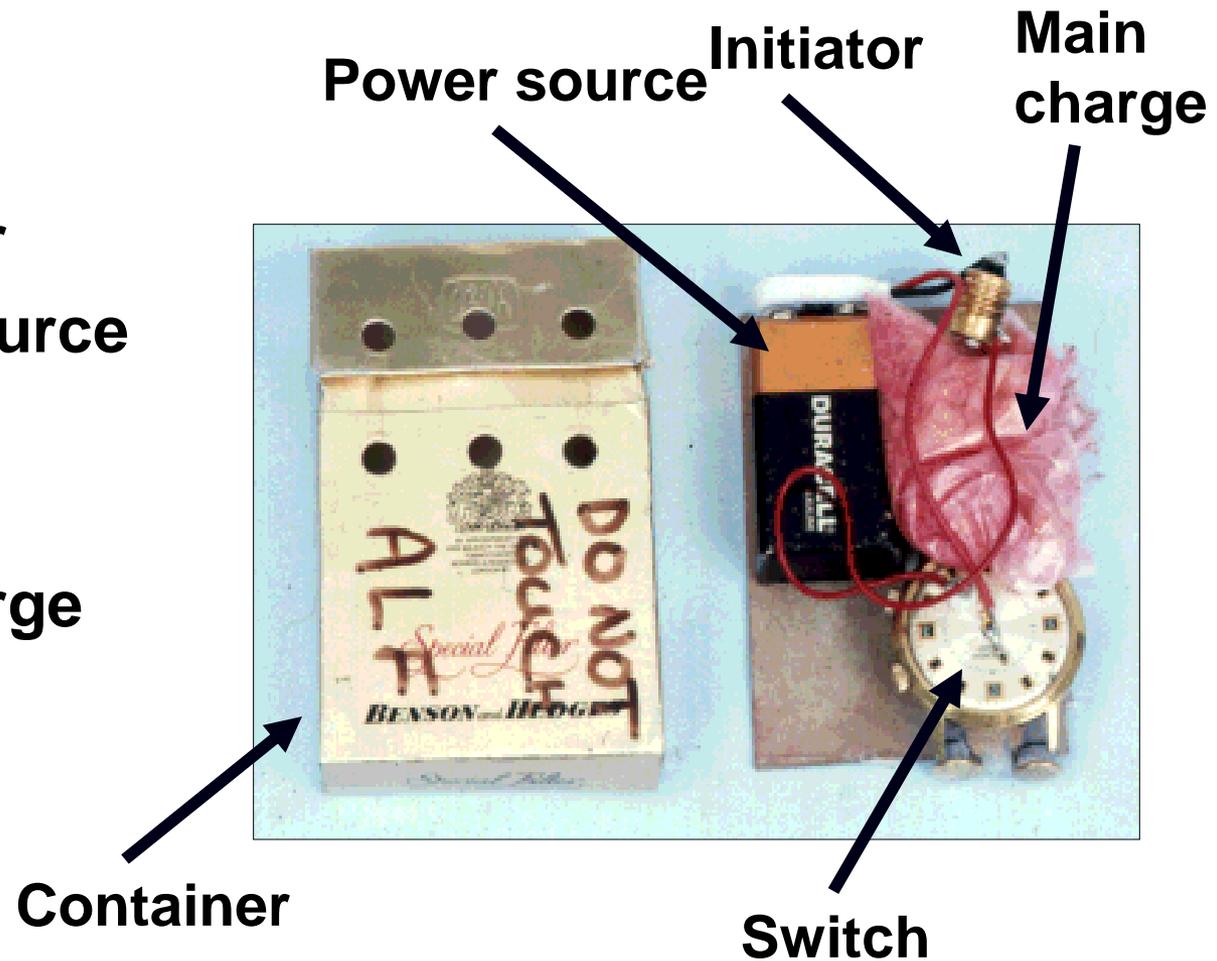


Vehicle IED VBIED



IED Components

- **Components**
 - **Container**
 - **Power source**
 - **Switch**
 - **Initiator**
 - **Main charge**





IEDs – A Persistent Threat

- **For a few years, the single largest cause of U.S./Coalition casualties**
- **Use by Jihadists has steadily increased over the last 7 years**
 - **Used in a large number of attacks on coalition forces**
 - **Specifically targeting critical forces:**
 - **First Responders**
 - **EOD**
- **The breadth of use has expanded since their first appearance in Iraq in 2003**



IEDs – An Evolving Threat

- Explosives are readily available to terrorists, including advanced explosive charges
- Advanced sensor and remote detonation technologies
- There are multiple arming and firing systems

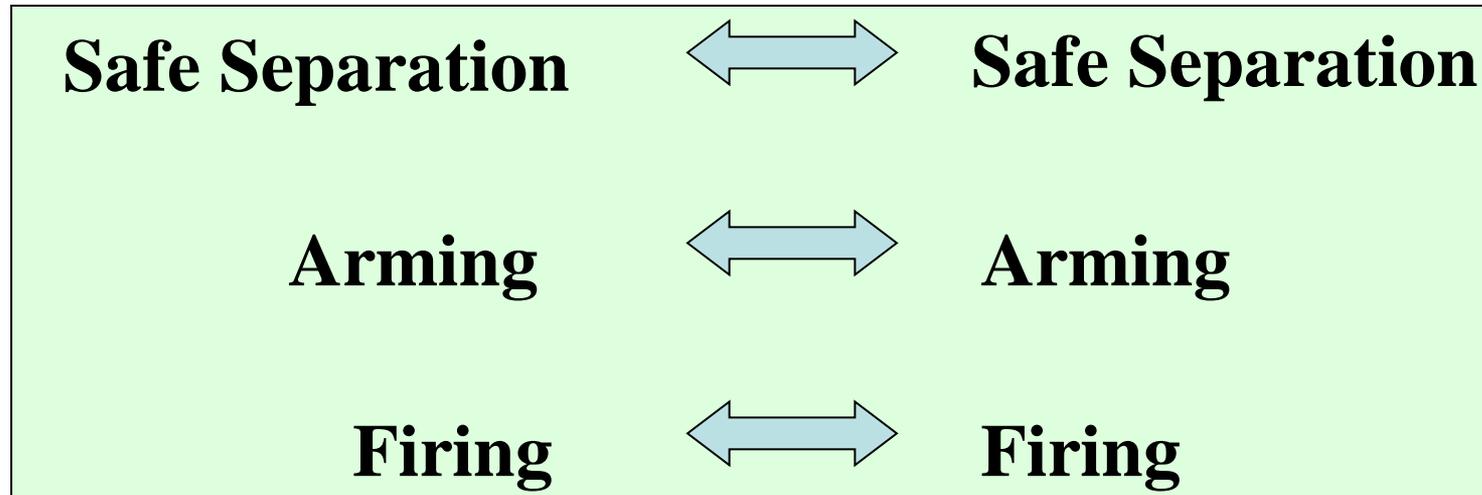




Commonalties & Differences

IEDs

WMD Dispersal Devices



High Explosives



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CBRN

- Render Safe Procedures
- Can Often Blow-in-Place
- Current TTPs

- Can NEVER BIP
- Modified TTPs
- MUST Render Safe



How DTRA Became Involved in IEDs

- Commands requested DTRA assistance
- DTRA Liaison Officer deployed to OIF
- Delivered first equipment shipment
- Delivered additional shipments
- Maintained Liaison Officer presence in theater
- Currently supporting Allied forces on WMD matters



Phase I – COTS Solution

- Provided modified Commercial Off The Shelf (COTS) technologies directly to deployed OEF/OIF forces
- Delivered new EOD support tools into theater (over 2700 items)
- Proved concept for X-ray backscatter interrogation
- Proved concept for disposable robot
- Hosted 1st International IED Workshop



Phase I - Tactical Optics Solutions

- Thermal Imagers
- Video Cameras
- Range Finders
- Stabilized Binoculars
- Wireless Camera Systems
- Spotting Scopes



Phase I - Other Solutions



Disposable Robot



Segway



Phase II - Rapid Development and Tng

- Material Solutions
 - Portable Forensics Kit
 - Non-Intrusive Detection
 - Vehicle Borne IED Defeat System
- Mobile Training Teams (MTTs) to train the trainer



Phase II - Mobile Training Teams (MTT)

- Provided familiarization training related to DTRA sponsored equipment
- Provided to deploying EOD Forces with DTRA sponsored equipment
- Assisted in developing IED training scenarios
- Enabled development of tactics, techniques and procedures (TTPs)
- Enabled the development and validation of new concepts of operations





Phase III – Prepare for the Future

- Investigate, introduce and implement long-term technology development to counter the IED threat
- Support the warfighter
- Prepare for the possibility of the WMD IED



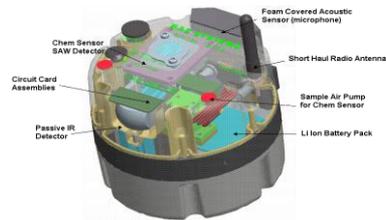
Phase III – Other Technologies

Vessel Boarding & Inspection System



Broadband wireless connectivity, two way communications, streaming video and WMD sensor data from host ship through inspection of boarded vessel of interest

Multi-Nodal Unattended Ground Sensor



Hand emplaced multi-modal (acoustic, seismic, PIR and chemical (CWA and TICS)) sensing wireless nodes for situational awareness and intrusion detection

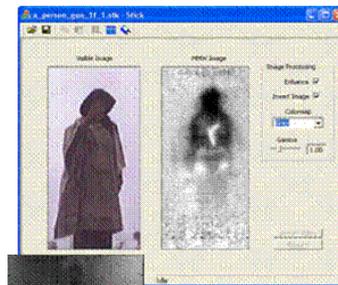
Deployable Technical Intelligence Laboratory



State-of-the-art, immediately deployable, self-contained forensics laboratory for combat operations, contingency missions, and training

Prototype Passive Millimeter Wave Imaging System

Suicide bomber detection





Phase III – Other Technologies

- Engineered Neutralization and Dispersion Source (ENDS) - creates a synergistic blast/fragment load environment that is severe enough to dismember and neutralize the IED without precipitating high-order detonation
- Developed a system to detect and identify concealed radioactive emissions in extreme environments
- Developed an enzyme method for detecting the presence of blood, nerve, and blister agents
- Working on a low-cost system for rapid screening of suspect areas with near real-time identification of explosives



What Does This All Mean?

It means that with the continued emphasis on combating WMD and securing the homeland, the Defense Threat Reduction Agency will play an increasingly important role in the ability locate, access, diagnose and defeat improvised explosive devices.



Fielded Efforts

- DTRA has expended significant resources to put tools into the hand of the operator. The following slides depict some of these efforts
 - Detection Tools
 - Diagnostic Tools
 - Access Tools
 - Defeat tools



Detection Tool - XPAK

- Trace Explosives Detector
- Real time
- Built in GPS
- Detects Commercial Explosives
- Future Development
 - Smaller
 - Lighter
 - Detect HME





Device Information systems

- HME Data base – everything you wanted to know about home made explosives
- CB Data base- all inclusive chemical and biological searchable data base
- Data Extraction Tool- Works with Triage system to help characterize device design and rapidly identify potential Improvised Nuclear Devices



Diagnostic Tool – Ltwt X-Ray Generator

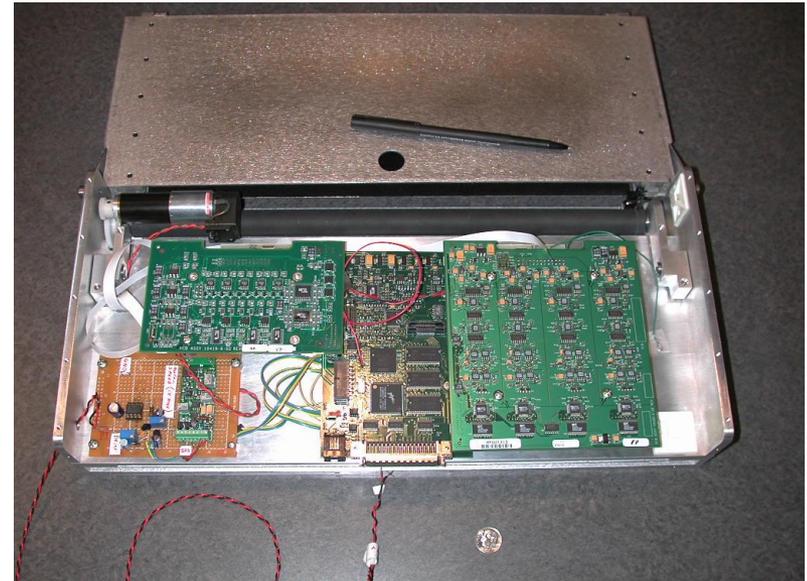
- May replace XR150
- Improved lightweight X-ray system
 - Lighter
 - More reliable
 - Higher energy
- Currently in development at LANL





Diagnostic Tool – Scanner

- Lightweight Phosphor panel digital scanner
- 7 pounds
- Battery powered
- Back packable





Diagnostic Tool – Digital Probe

- Improved performance
- Modular probe extensions
- Increased sensitivity across dynamic range
- Passive Diagnostic tool





Diagnostic Tool – Torion GCMS

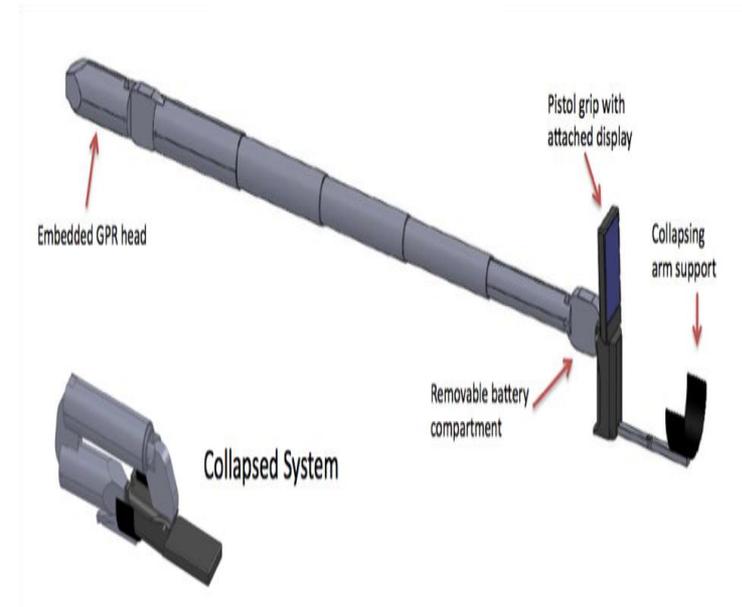
- **Gas Chromatograph
Mass Spectrometer**
 - Near Real Time <1AMU resolution
 - System is totally self-contained
 - Weighs less than 28 pounds
 - Battery or fixed power operated
 - Easy to operate with a simple three button navigation
 - Ideal for rapid screening of chemicals including VOCs/SVOCs
 - Explosives, chemical warfare agents, and hazardous substances





Diagnostic Tool – Metal Detector

- Smaller and lighter
- Folding and telescoping design
- Active/passive and merged modes
- 5lbs or less





Access Tool – Conex Cutter

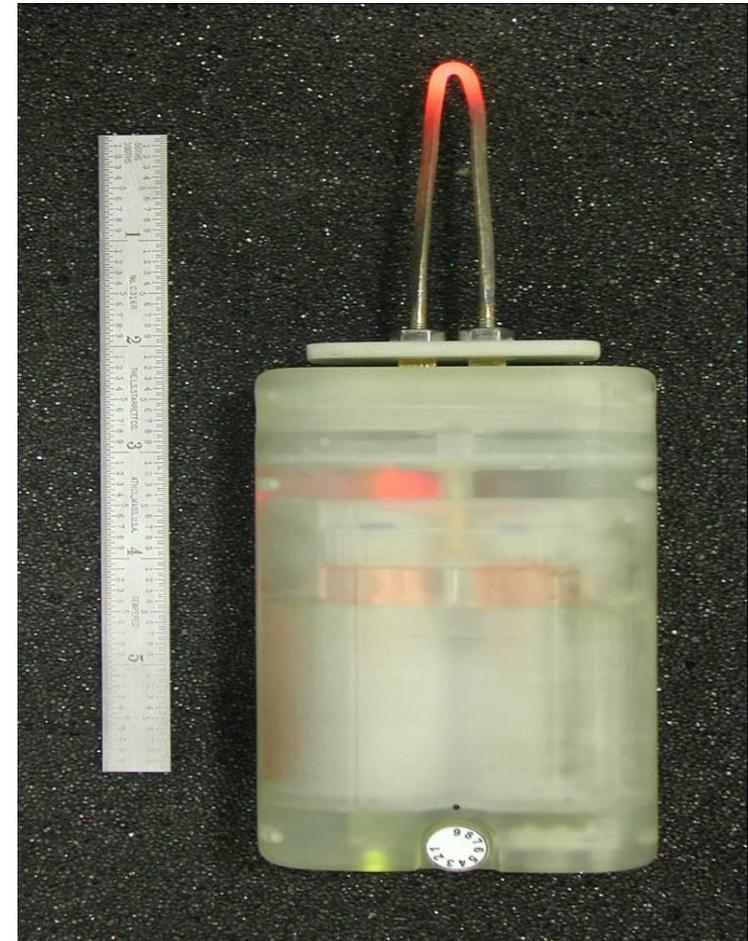
- Lightweight
- High mechanical advantage
- Cuts a 2' X 2' square access panel in 1/8" conex skin in under 2 minutes





Access Tool – Smart Knife

- Battery powered
- Quick recharge
- Almost instant on
- Multiple blades for various type cuts
- Rapid temperature adjustment





Mechanical Tools – Coaxial Cutter

- Light weight
- Expandable in length
- Multiple heads for different applications
- Used on smaller coax





Mechanical Tools– Medium Coaxial Cutter

- Light weight
- Expandable
- Multiple heads for various applications
- For medium size coax





Mechanical Tools– Heavy Coaxial Cutter

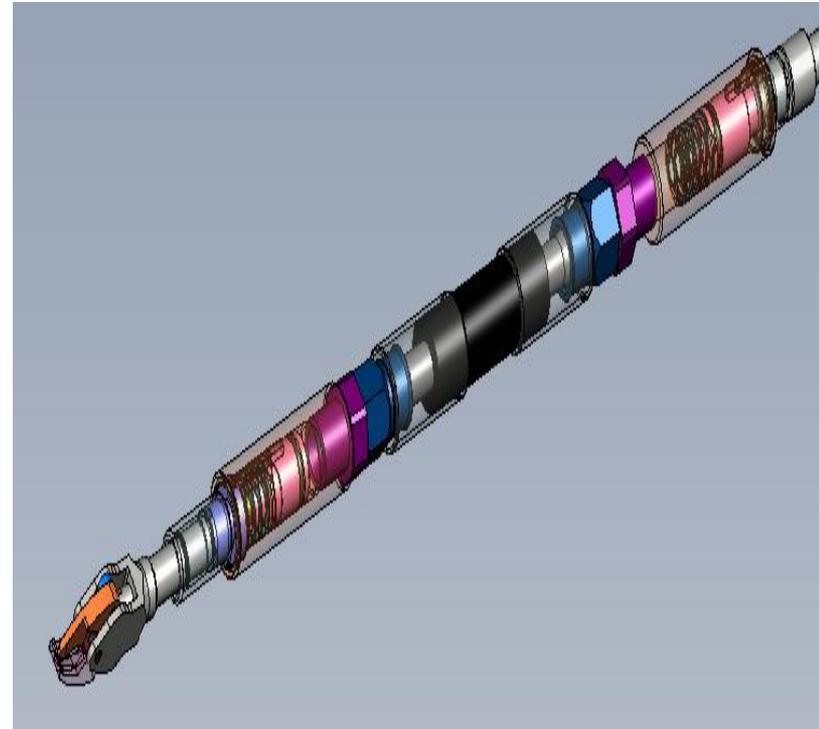
- Light weight
- Expandable
- Multiple heads for various applications
- For large heavy duty coax





Mechanical Tools – Coaxial Cutter Shaft

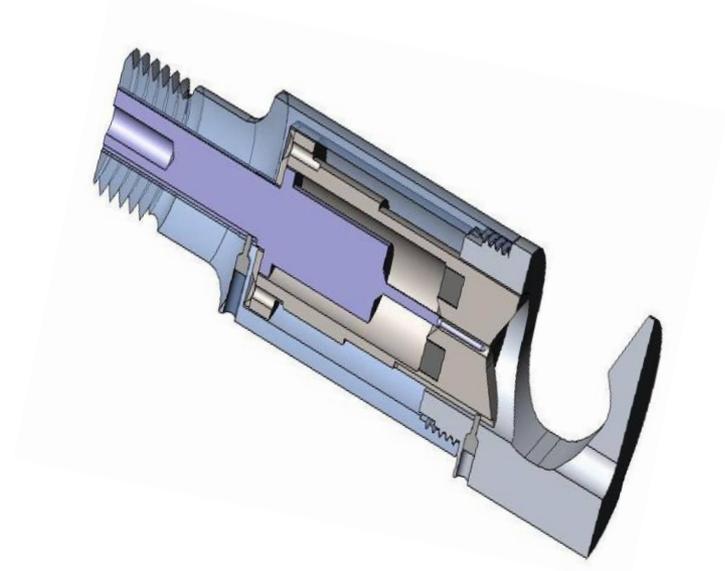
- Flexible shaft for use with a variety of co axial cutters
- Expandable to give greater flex





Mechanical Tools – Shorting Tool

- Insulated Shorting Tool Head
- Allows precise placement of shunting pins





Defeat Tool – Precision Aim Suite

- Single integrated system
- Constructs 3d view of target
- Allows exceptional accuracy with a variety of disruption charges





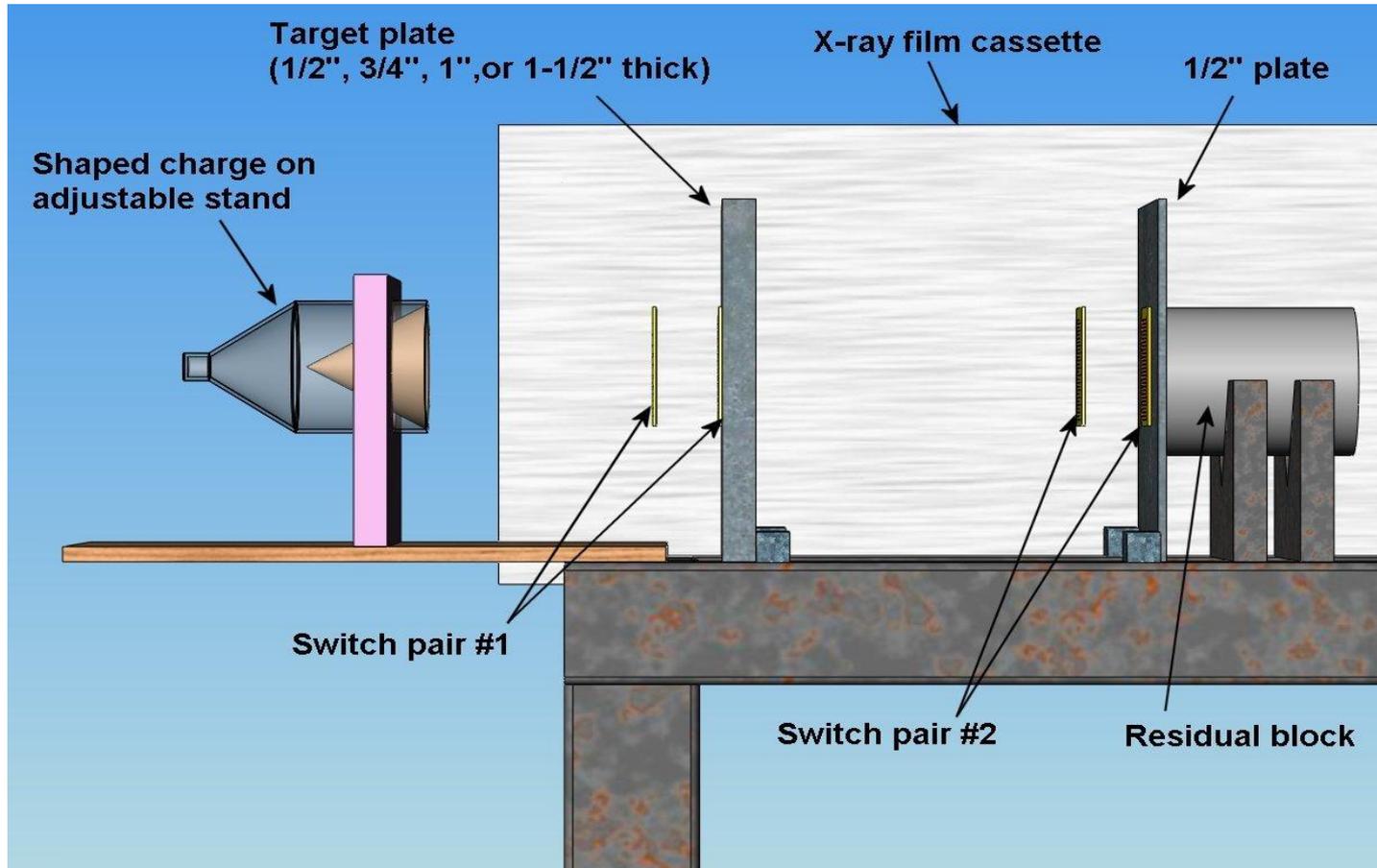
Defeat Tool – Shaped Charges

- Various types of shaped charges





Testing and Evaluation





Additional Support to EOD

- Technical Support Groups
- Equipment Testing



TSG Mission

- Provide training in radiological detection and monitoring to designated personnel.
- Conduct test and evaluation of Radiological detection equipment.





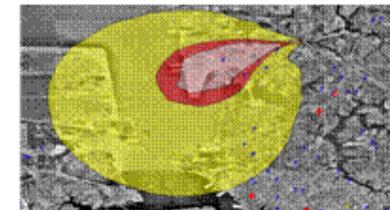
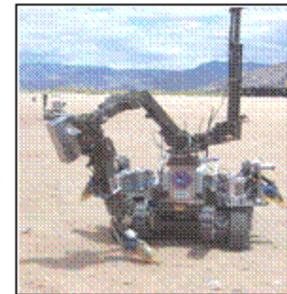
TSG Locations

- Washington Technical Support Group
 - Located at Fort Belvoir, Virginia
 - Provides training for forces in CONUS
 - Conducts Test and Evaluation of Equipment
 - Supports other TSGs and NTNF
- European Technical Support Group (ETSG)
 - Located in Stuttgart, Germany
 - Conducts training of EUCOM designated forces
- Pacific Technical Support Group (PTSG)
 - Located in Pearl City, Hawaii
 - Conducts training of PACOM designated forces
- CENTCOM Technical Support Group (CTSG)
 - Located in Manama, Bahrain
 - Conducts training of CENTCOM designated forces



Questions?

Making the World Safer...



...by combating weapons of mass destruction