EHAT Lesson 1.3: IED Fundamentals

Overview

1.3.1 Components of an IED

1.3.2 IED initiation and systems

1.3.3 IED emplacement

Terminal Learning Objectives

At the end of this module, the participants will be able to outline the types of IEDs and their components and demonstrate a thorough understanding of the initiation systems.

1.3.1 Components of an IED

Definition of an IED:

A device placed or fabricated in an improvised manner incorporating destructive, lethal, noxious, pyrotechnic or incendiary chemicals and designed to destroy, incapacitate, harass or distract. It may incorporate military stores, but is normally devised from non-military components

- ***UNMAS Lexicon Definition***

Components of an IED

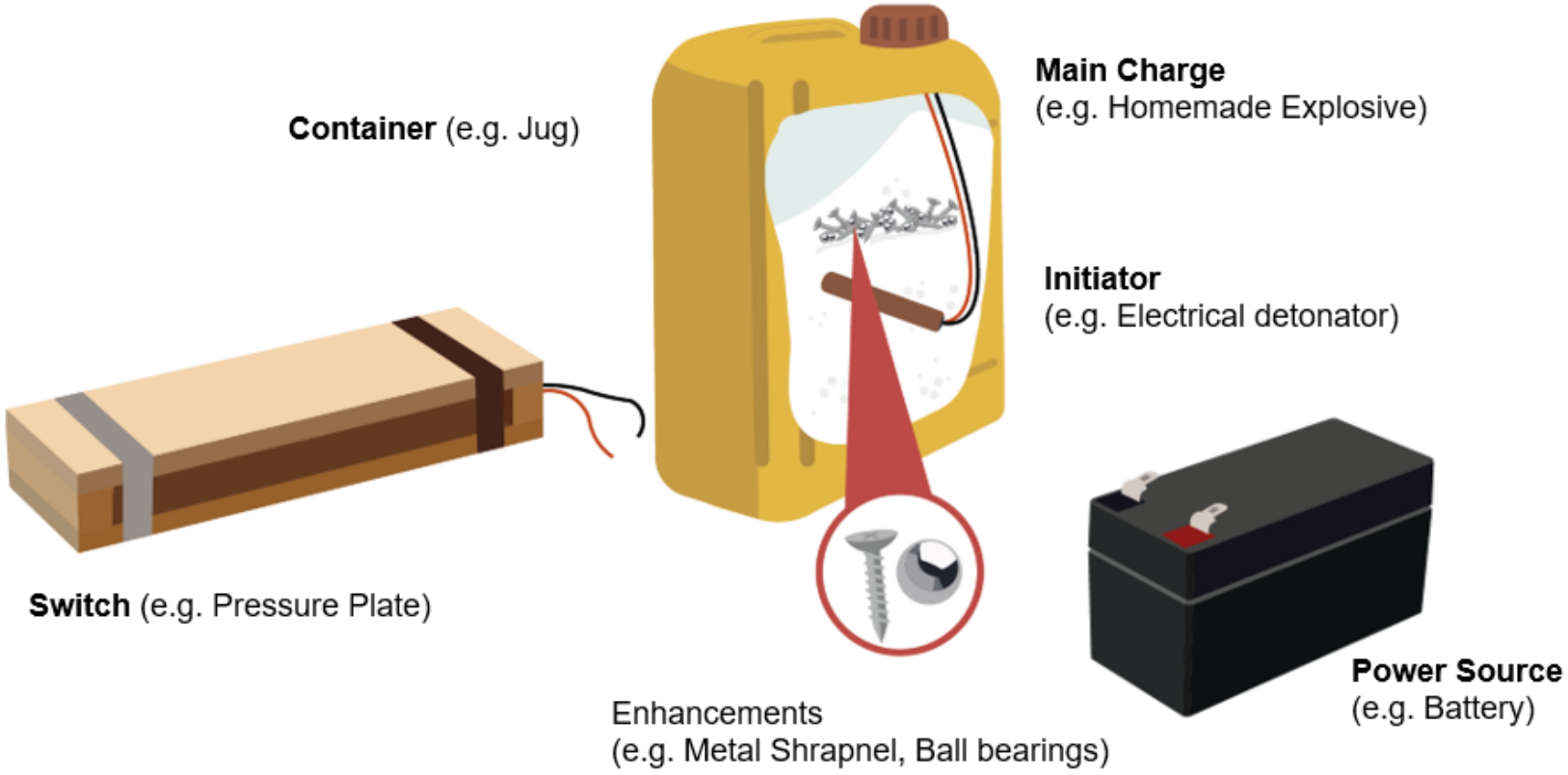

Figure 1-1: Components of an IED

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Components of an IED

Components of an IED

Switches

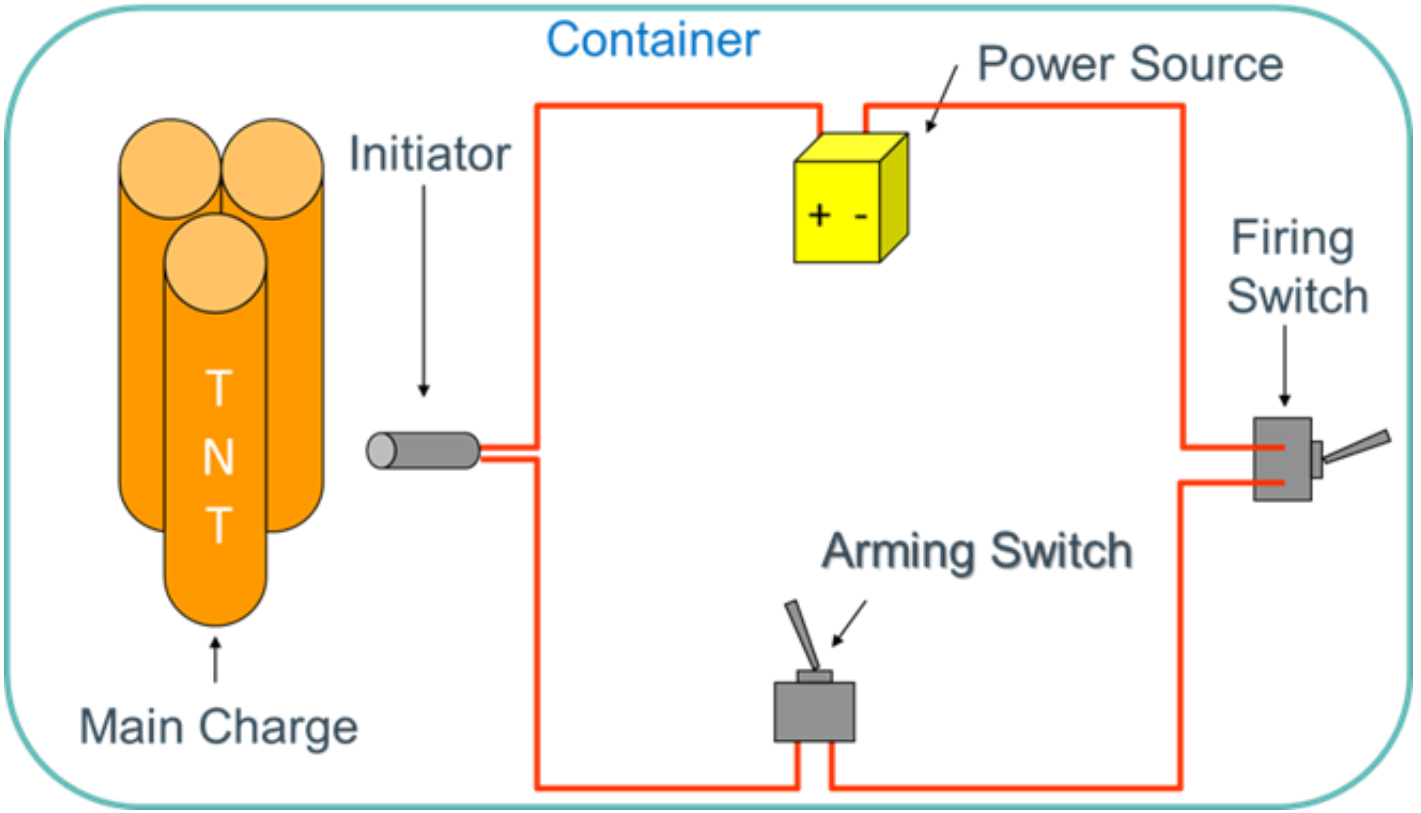
Initiator

Main charge

Power Source

Container

Enhancements

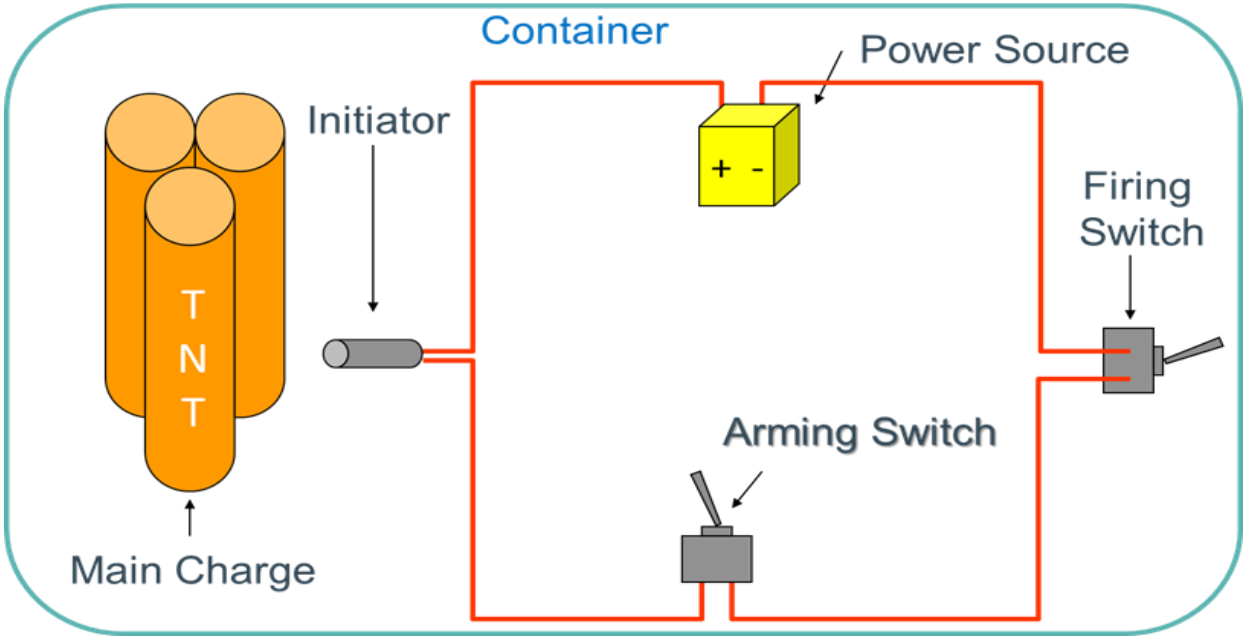


Components of an IED: Switches

The Switch is a device for making, breaking, or changing a connection in an IED.

- Arming switch – gives Bomb maker safety during; Fabrication, Transportation & Emplacement.
- Firing switch – initiates the firing sequence.

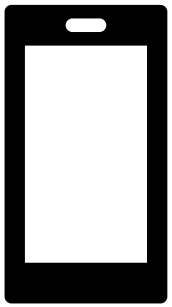
- **Firing Switch –** always present
- **Arming Switch –** may be present as a safety feature



Components of an IED: Switches

There are 3 types of Firing Switches:

- **T**ime Operated
- **C**ommand Operated,
- **V**ictim operated.



Components of an IED: Initiator

Any component that may be used to start a detonation or deflagration.

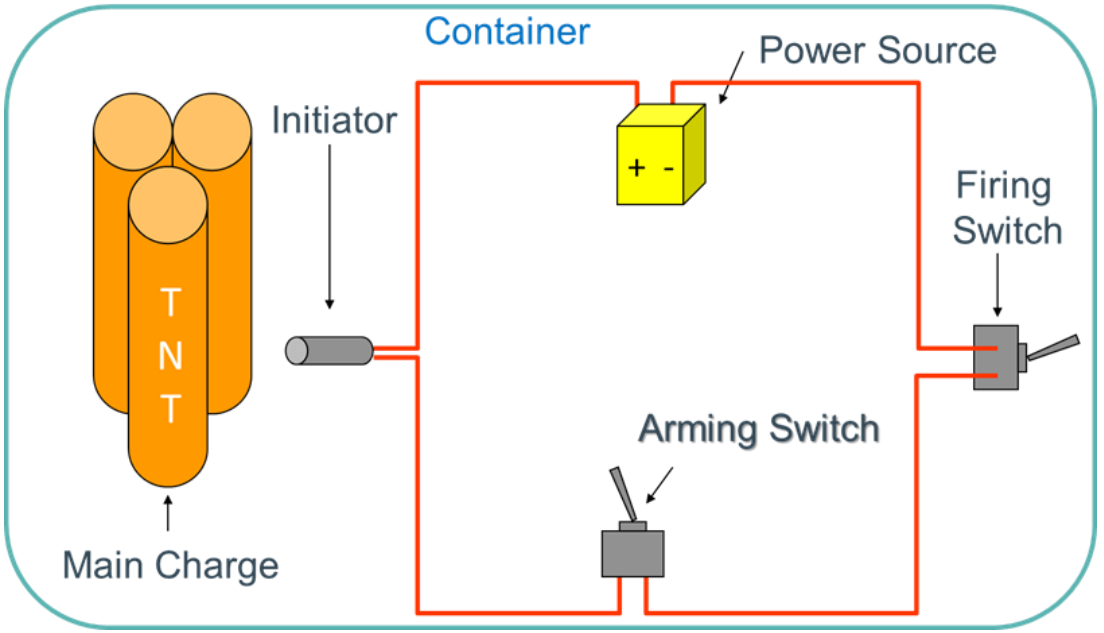
A small tube containing explosives which are sensitive to heat, shock, or friction.

Two types;

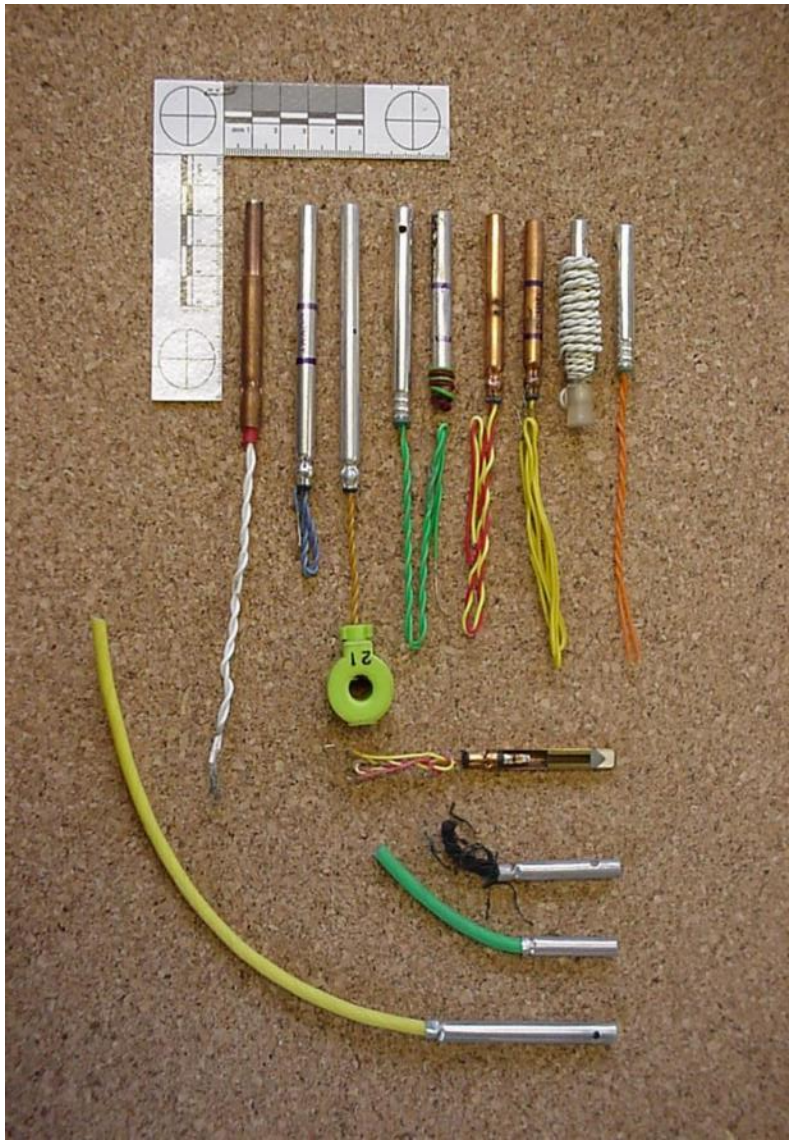
- Electric
- Non Electric

These can be:

- Military
- Commercial
- Home Made

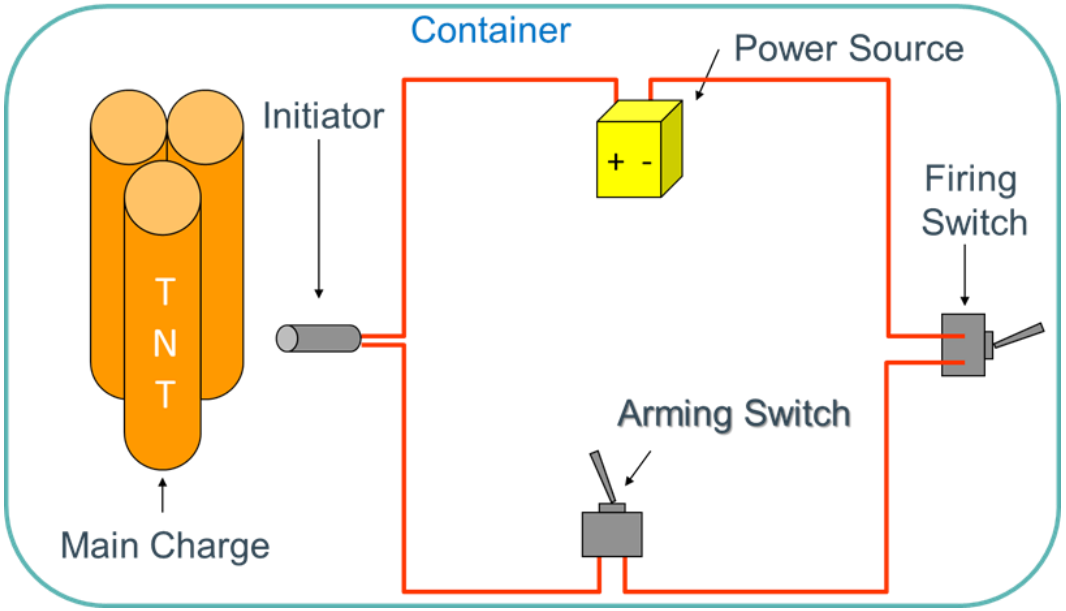


Components of an IED: Initiator



Components of an IED: Main Charge

The bulk explosive component of an IED capable of providing an explosion by its own energy when initiated



Components of an IED: Main Charge

Military

Components of an IED: Main Charge

Commercial

Components of an IED: Main Charge

Home made

Potassium Chlorate

Ammonium Nitrate Aluminum (ANAL)

Calcium Ammonium Nitrate

Components of an IED: Power Source

A device that stores or releases electrical or mechanical energy. Used to provide power to the electrical initiator.

In most cases, the power source is usually a battery.

Common battery types include:

- 12V car batteries
- 12V Motorcycle batteries
- 9V and 6V dry cells.
- Multiple AA or D cells

12V Motorcycle Battery

6V Motorcycle Battery

9V Battery used in PBIEDs

Components of an IED: Power Source

The key elements that determine the type of battery are:

- Availability
- Method of delivery
- Lead time for emplacement
- The number of initiators in the device.

12V Motorcycle Battery

6V Motorcycle Battery

9V Battery used in PBIEDs

Components of an IED: Power Source

Components of an IED: Container

- An IED Container is any item with a void within it, into which the other components of an IED are placed.
- IED containers can simply contain components of an IED or can also act to **conceal** the components and / or **confine** the explosive material of the IED which can produce direction effects.
- The container can serve both as a container and potentially an enhancement.

Components of an IED: Container

- **Plastic Containers** – 5 litre Milk Container & Yellow Oil Drums
- **Small Metal Boxes** - UVIED
- **Military Ordnance (MILORD)**
- **Vehicles (VBIED)**
- **Machined containers** for directional effects
  - Directional Fragmentation Charges (DFC)
  - Improvised Claymores (IC)
  - Platter charges
  - Explosive Formed Projectile (EFP)
- **Vests** – used by PBIED

Components of an IED: Enhancements

- An optional, deliberately added components (as opposed to secondary hazard) which modifies the effect of an IED. The IED would be effective, yet produce a different measurable result if enhancements are not added
- Enhancements are also considered a characteristic of a container
- Indicators/Observables - The following indicators could be evidence of efforts to enhance IEDs:-
  - **Fragmentation** such as ball bearings, nuts, bolts, washers, nails, bullets, shell casings, scrap metal, rocks, glass, etc.
  - **Gas cylinders & containers** – Compressed Propane, Oxygen, Acetylene and other gases, intended to increase blast, thermal and / or fragmentation effects.
  - **Liquid Gasoline, diesel and paraffin** in plastic or metal containers could be present as an attempt to give the IED a greater blast and/or thermal effect.
  - **Charge Effect**

Ball bearings

Ball bearing mixed with explosive

Components of an IED: Enhancements

Explosive Effects

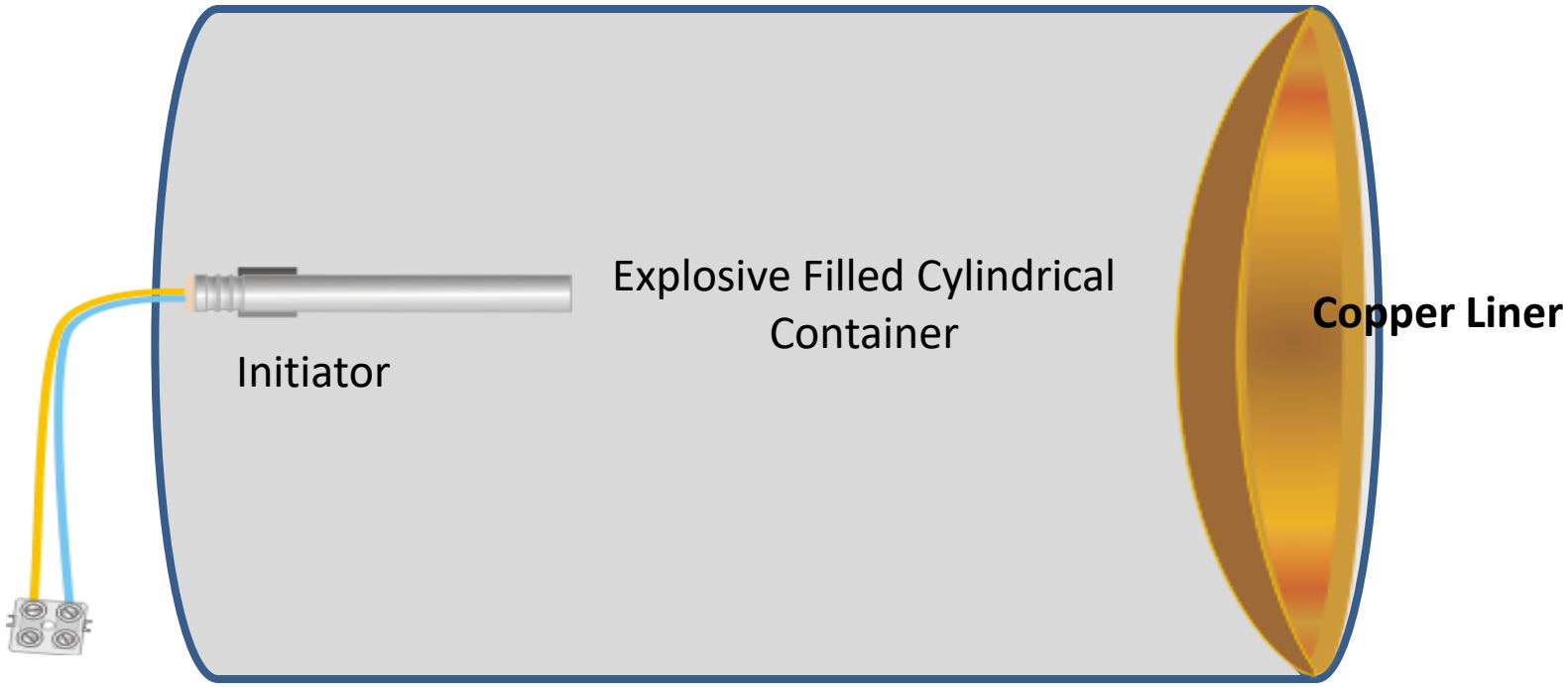
1. Blast
2. Fragmentation
   - Omni-directional
   - DFC
3. Anti-Armour
   - EFP

Components of an IED: Enhancements

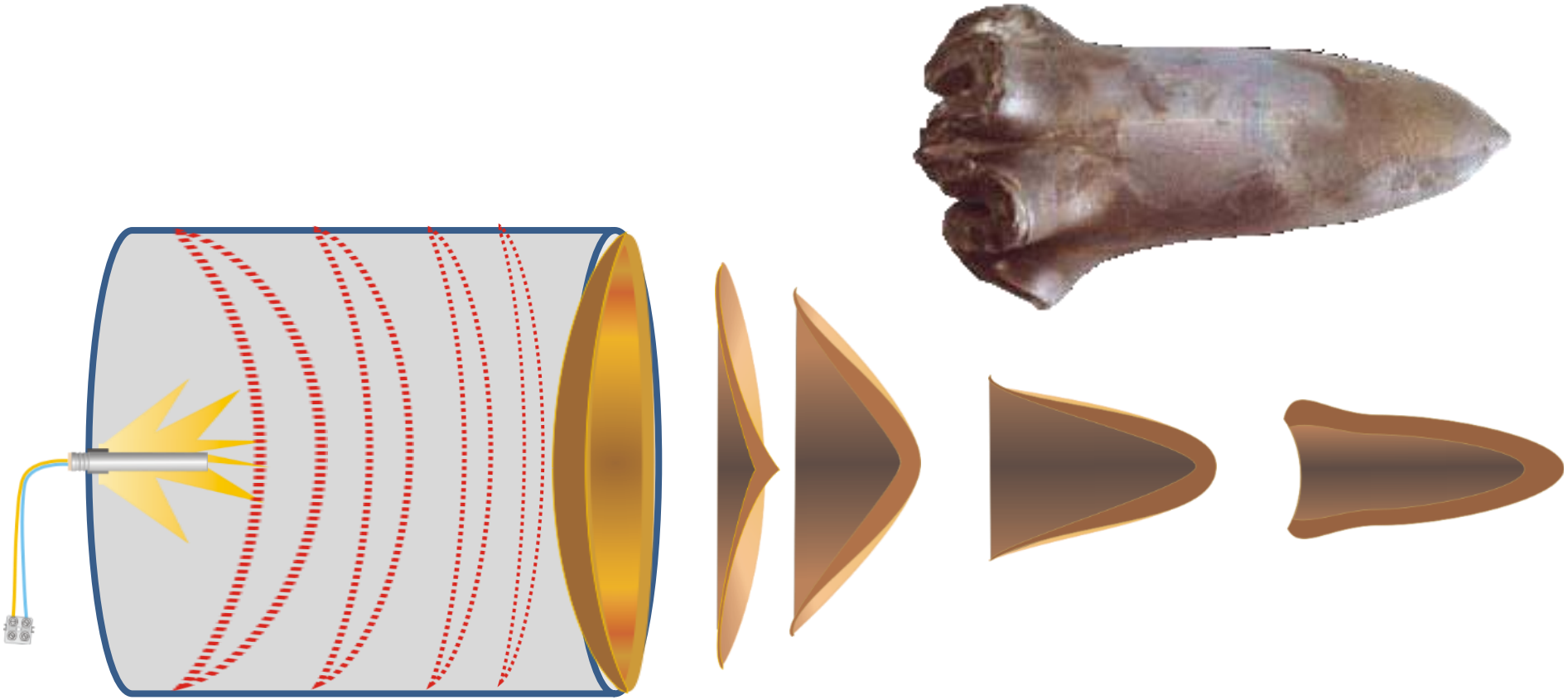
Explosively Formed Penetrator, Self Forging Fragment

The EFP can defeat the new generation armoured vehicles.

Components of an IED: Main Charge



Components of an IED: Enhancements



Questions?

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1.3.2 IED Initiation Systems

IED Initiation Systems (Type of Switches)

IED Initiation Systems: Command

This category of IED comprises command switches. This is a type of switch that is activated by the attacker in which s/he controls the device and function it at an opportune moment.

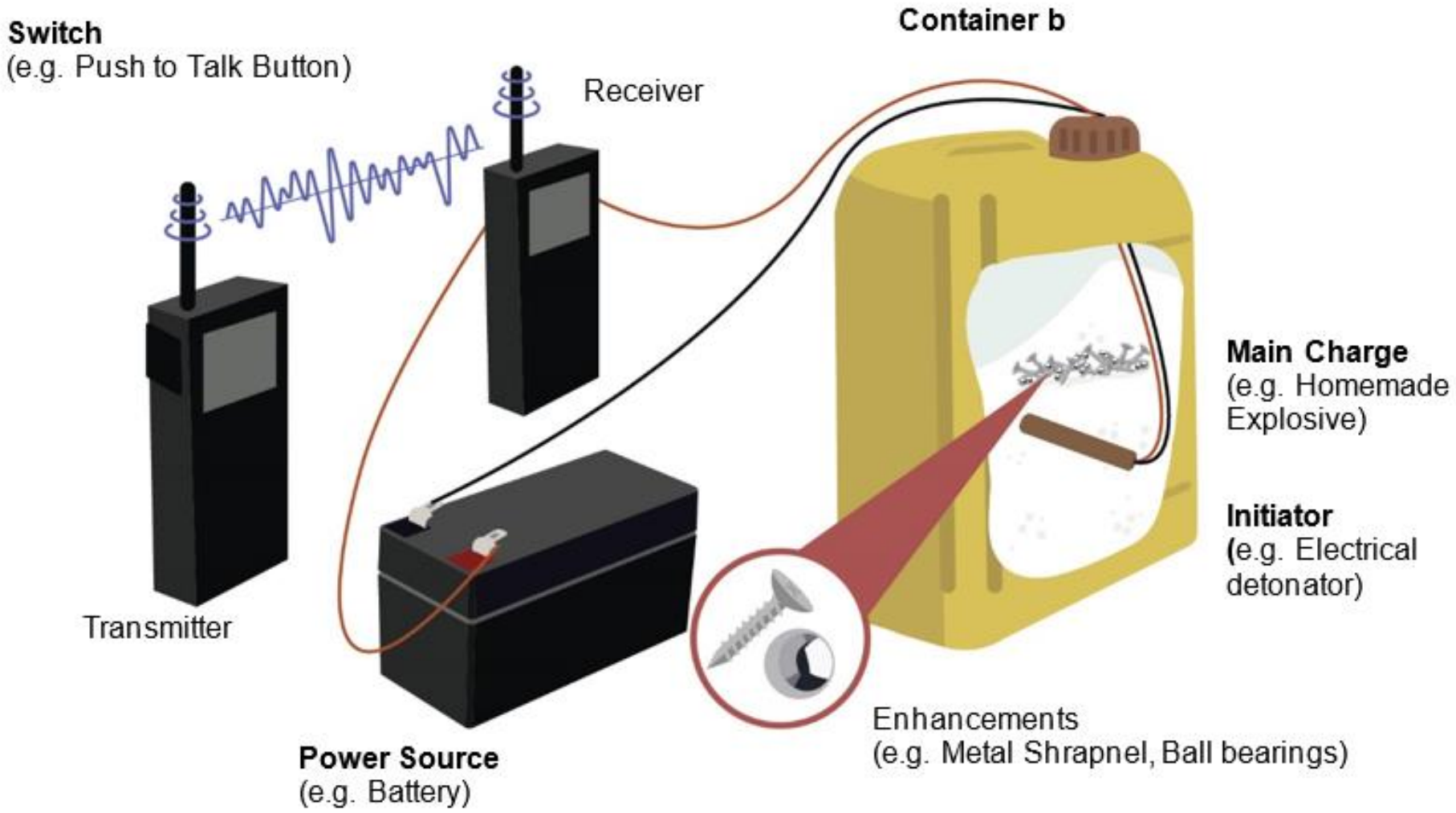
Command IEDs operate in two modes

- Physical link
- Non-physical link

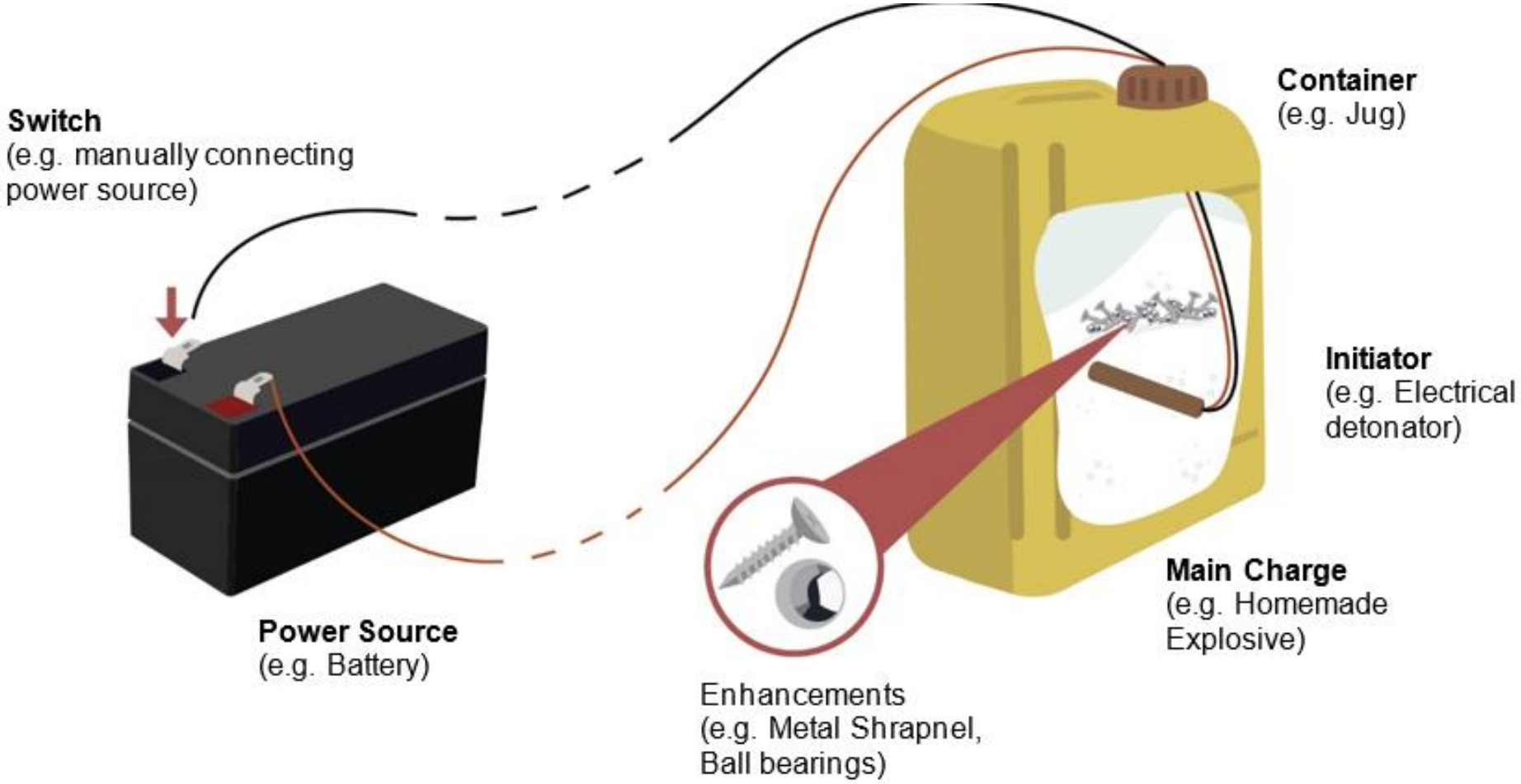
IED Initiation Systems: Command

- Used to attack specific targets.
- Used against slow moving and static targets but which are in a predictable location at a somewhat predictable time
- Required the attacker to identify a firing point and a contact point.
- Includes suicide IEDs

IED Initiation Systems: Command Remote Controlled IED (RCIED)



IED Initiation Systems: Command Command Wire IED (CWIED)



IED Initiation Systems: Command Suicide

Usually refers to an individual wearing explosives and detonating them in order to kill others including themselves.

The bomber will conceal explosives on and around their person, commonly using a vest and will use a timer or some other trigger to detonate the explosives.

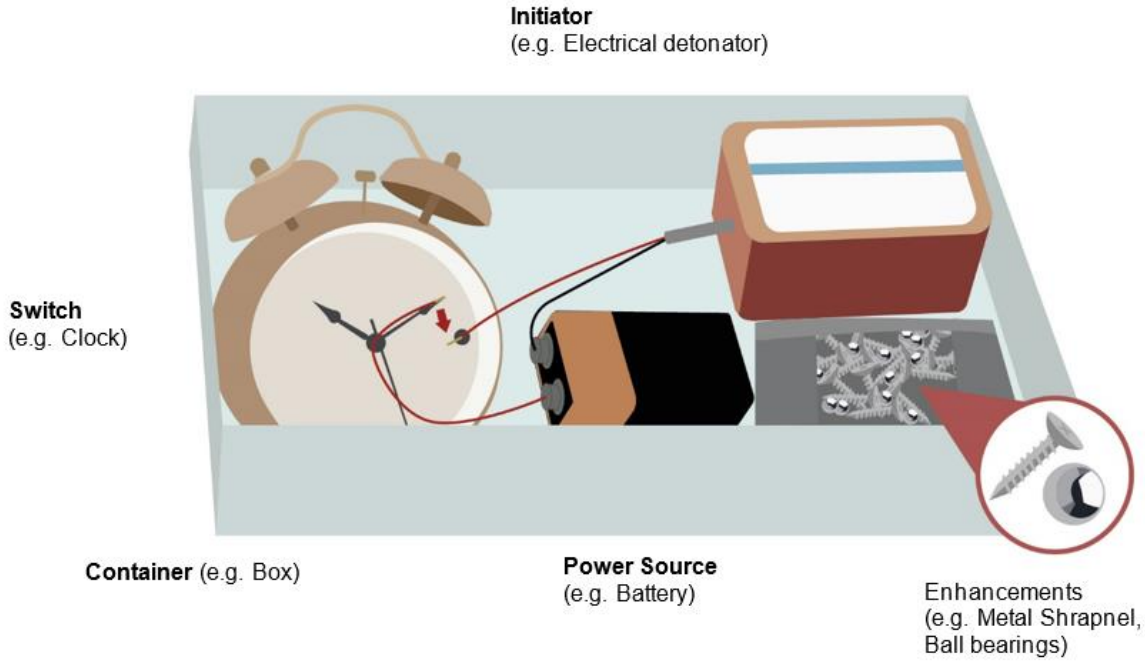
The logic behind such attacks is the belief that an IED delivered by a human has a greater chance of achieving success than any other method of attack

IED Initiation Systems: Time

- Time initiated is the method by which an IED self-initiates at a predetermined time or delay.
- The relies on accurate predictions by the aggressors of the intended target's time at a specific location.
- Used for targeting static, predictable targets.

Types of timed IEDs

- Mechanical
- Chemical
- Electronic



IED Initiation Systems: Time

Advantages

- Allows time to evacuate
- Allows time to escape
- Can be placed long before known event

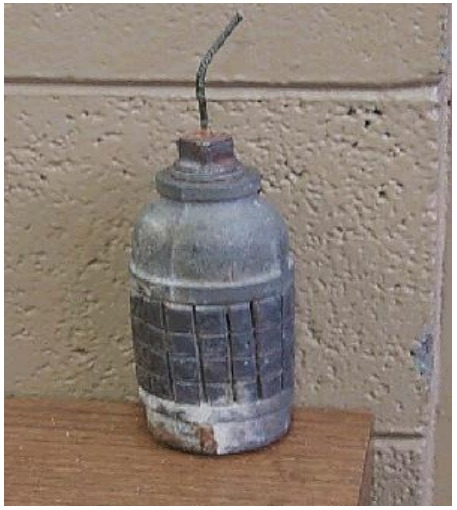
Disadvantages

- Difficult to attack a specific target
- Can be stopped by trained IEDD/EOD team
- Once set the terrorist loses control

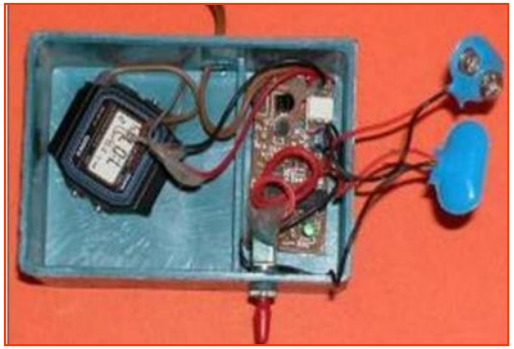
IED Initiation Systems: Time

Mechanical

Chemical



Electronic



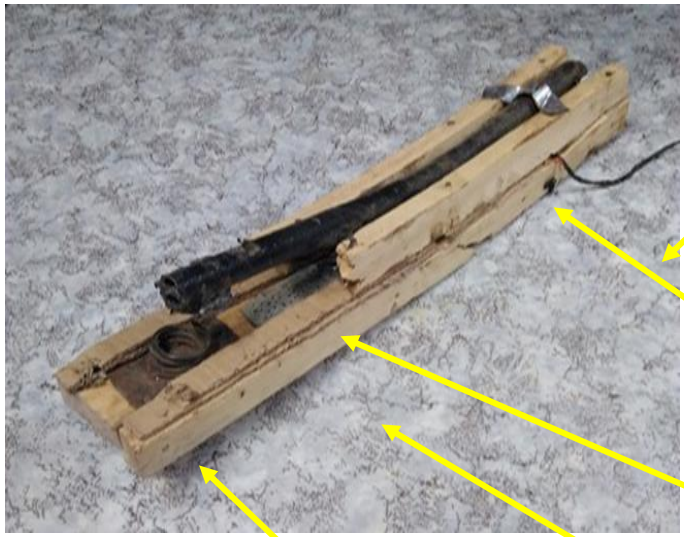
IED Initiation Systems: Victim

A switch that is activated by an unsuspecting individual. These switches rely on the intended target to carry out some form of action that will cause it to function.

Methods Of Operation

- Pull
- Release (including Anti-Lift)
- Pressure
- Movement
- Environmental Changes

IED Initiation Systems: Victim



Connection Cables

Securing/joining metal sheets

Insulated conducting lever bar

Wooden Plates

Contact point

Waterproofing polythene

When pressure is applied on top of the plate, contact of the insulated sheet of metal and spring is established at the end points and hence completion of the electrical circuit which then initiates the device.

1.3.3 IED Emplacement

IED Emplacement

Deliberate emplacement in Stages: Normally Hidden

- Site Preparation - Hole dug at a pre-determined IED location - no conspicuous material, except a shovel.
- Emplacement and camouflaged
- Primed & Initiated – usually during daylight hours

Hasty emplacement:

Not as well camouflaged

IED Emplacement

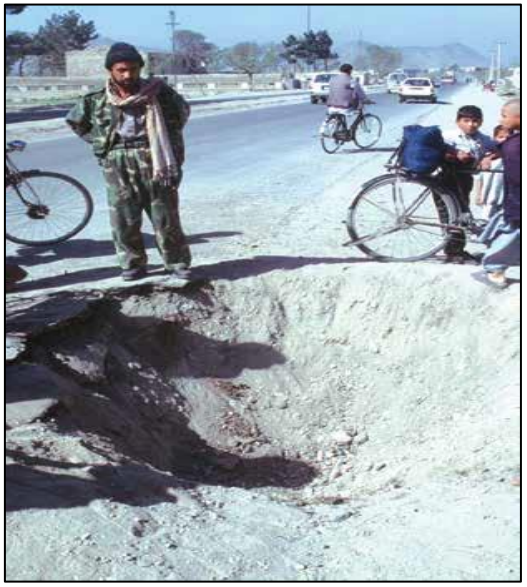
Surface:

- IED is emplaced on the surface of the ground.

IED Emplacement

Subsurface:

- The IED is buried beneath the surface of the ground.



IED Emplacement

Elevated:

- IED emplaced above the surface: hanging from an overpass, on a roof, etc.

Quiz

1. Name the components of an IED
   - *Switch, Initiator, Main Charge, Power source, Container, Switch and Enhancements (optional)*
2. Name sources of explosive used to make IEDs ?
   - *Military, commercial and Home Made Explosive.*
3. Name type of switches
   - *Command, Time, Victim operated*
4. Give examples of containers
   - *Plastic containers, small metal boxes, MILORD, vehicles, machined containers, vests*

Questions?

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