



PRESENTATION ON

# Centurion UNIVERSITY IMPROVISED EXPLOSIVE DEVICE

*Shaping Lives...  
Empowering Communities!*

CUFS 2416 EXPLOSIVE AND POST BLAST INVESTIGATION

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B.SC. FORENSIC SCIENCE (SEM 6)  
SCHOOL OF FORENSIC SCIENCES  
BHUBANESHWAR CAMPUS

# CONTENT

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- Introduction
- Basic types of IEDs
- Components of IED
- Principle of firing mechanism

# INTRODUCTION

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- An improvised explosive device is basically a “homemade” bomb and/or destructive device, used by criminals, vandals, terrorists, suicide bombers, and insurgents to intimidate inflict casualties, destroy property, and destabilize the existing setup or regime in the country.
- IED come in many forms, ranging from a small pipe bomb to a sophisticated device capable of causing massive destruction of life and property.
- IEDs are inexpensive and can be easily manufactured concealed and detonated.
- IEDs are also known as “dirty bombs”.
- **Defination of IED:-**It is 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.

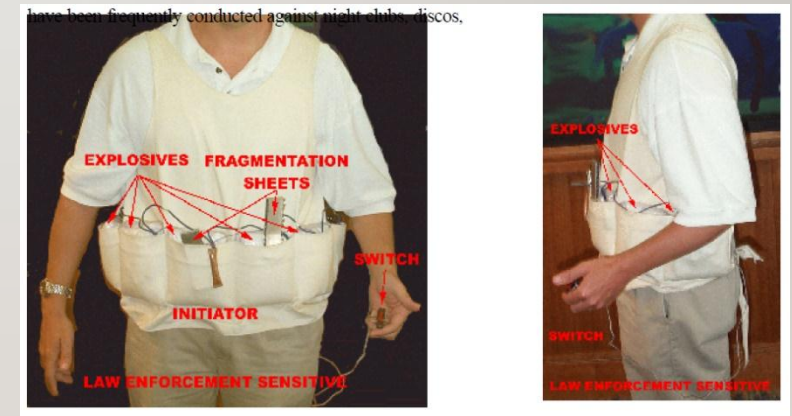
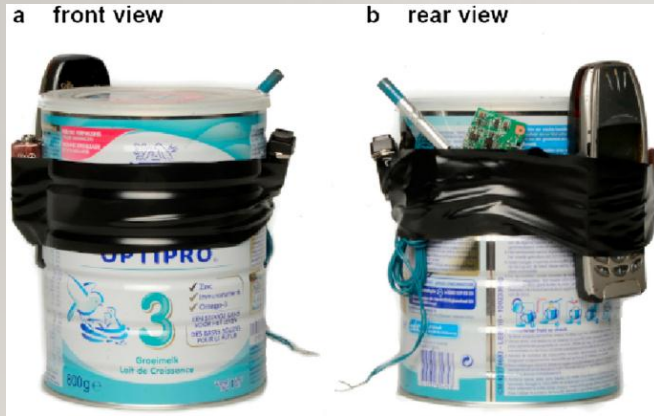
# BASIC TYPES OF IED:-

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1- Package/container type IED.

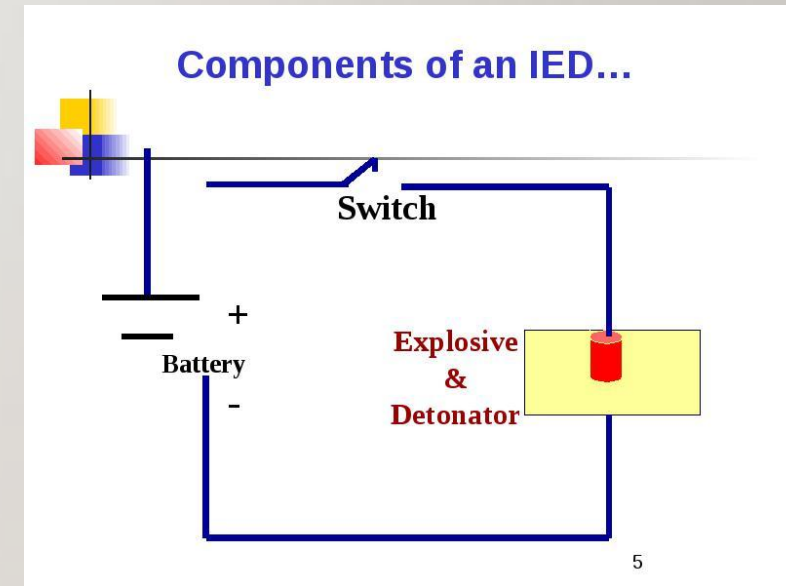
2- Vehicle borne IED

3- Suicide borne IED



# COMPONENTS OF IED:-

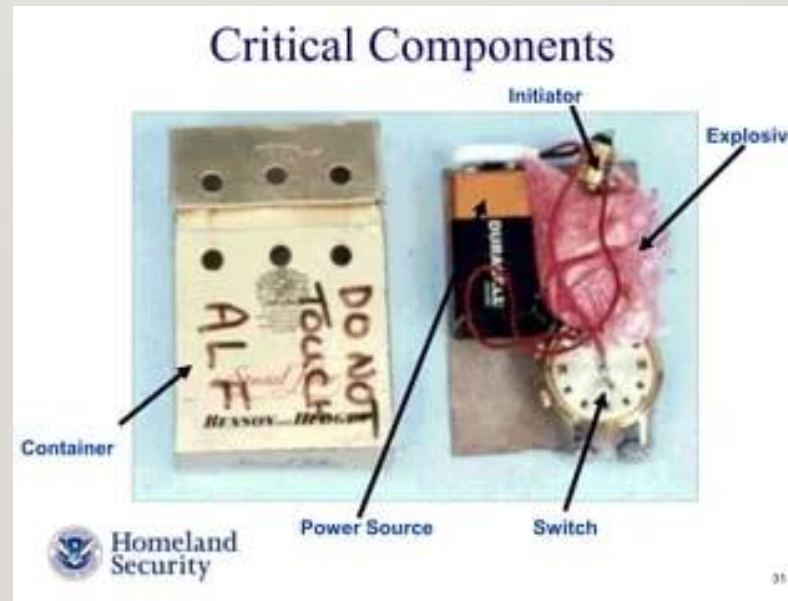
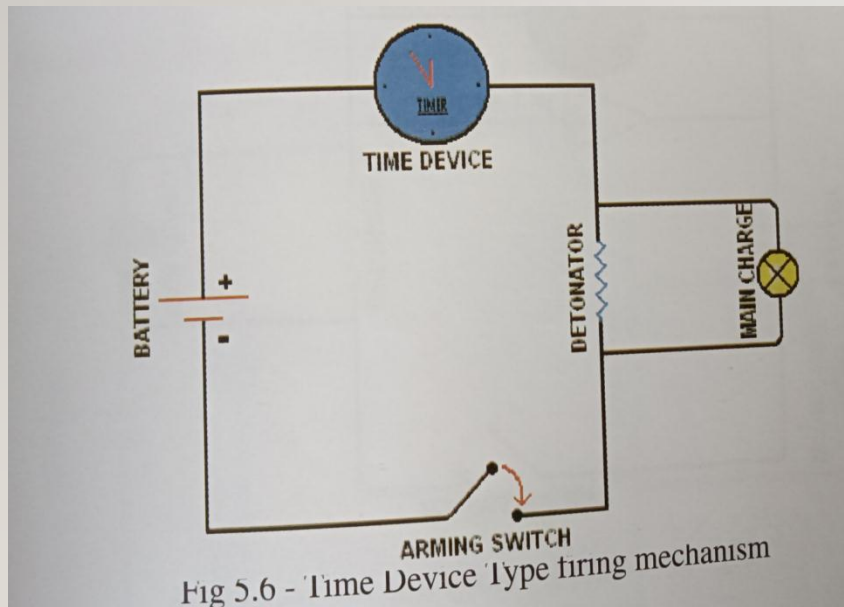
- **A Switch(Trigger or activator):-**A trigger or Activator is basically a switch or some other direct or indirect means of setting the device off, such as a radio signal, trip wire, cell phone, timer or firing button that someone presses.
- **Power supply(Battery):-**Power supply is often provided by car batteries or alkaline flashlight batteries.
- **An initiator( fuse or detonator):-**A detonator is a small explosive charge that sets off the main charge. Detonators are usually electrical, like those used for explosions in construction (blasting caps).
- **Charge:-**A main charge is the primary explosive body which is mainly responsible for creating the blast wave.
- **A container(body to hold everything together):-**A container is used to hold everything together.The container may be designed to force the blast in a specific direction.



# PRINCIPLE OF FIRING MECHANISM:-

- **Time Device Type firing mechanism:-**

When Arming Switch is on two arms of clock will overlap and current passes through the circuit thus completed and detonator is activated. In this type of device, instead of analogs watch, electronic circuit is used in this type of firing mechanism.



## Multiple Booby trap Mechanism:-

- In this circuit OR gate principle of logic circuit is used.
- Any of the three circuit i.e. Micro switch, Time device or Tilt switch is activated the current will flow in the circuit and the mechanism will activated.

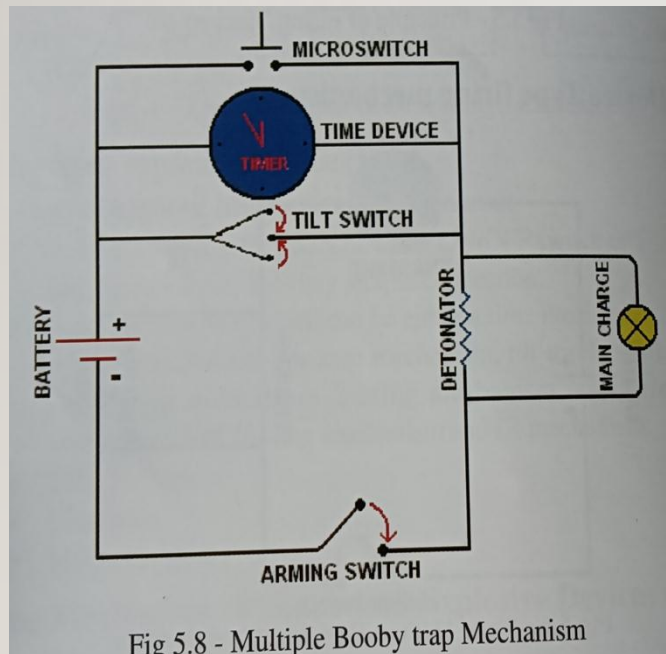
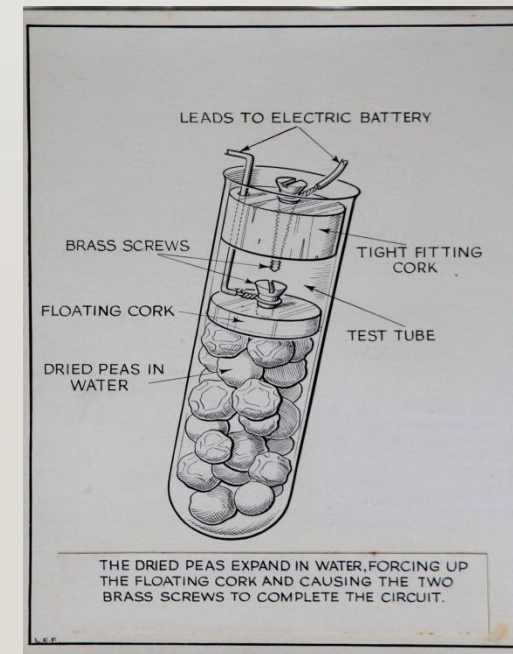
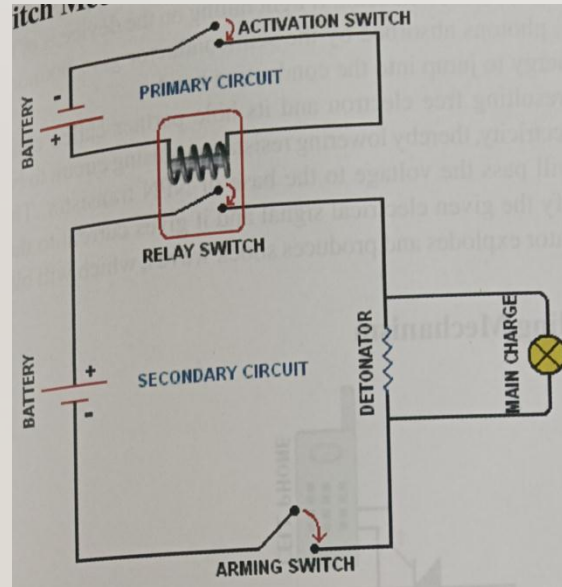


Fig 5.8 - Multiple Booby trap Mechanism



### Relay Switch Mechanism:-

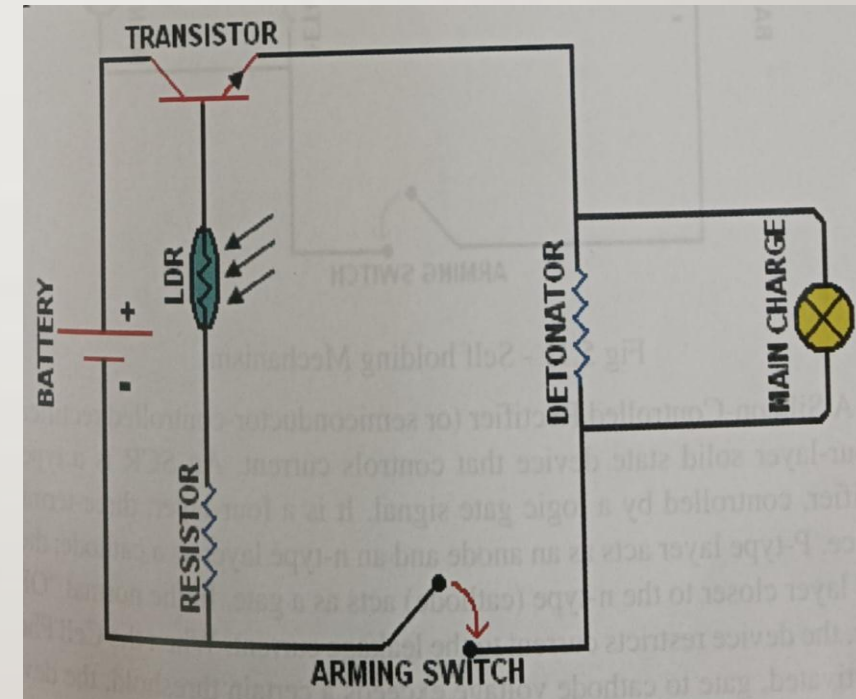
In this circuit,once the activation switch is ON,it will produce electro magnetic field in the Relay switch and secondary circuit will be complicated and detonator will be activated.





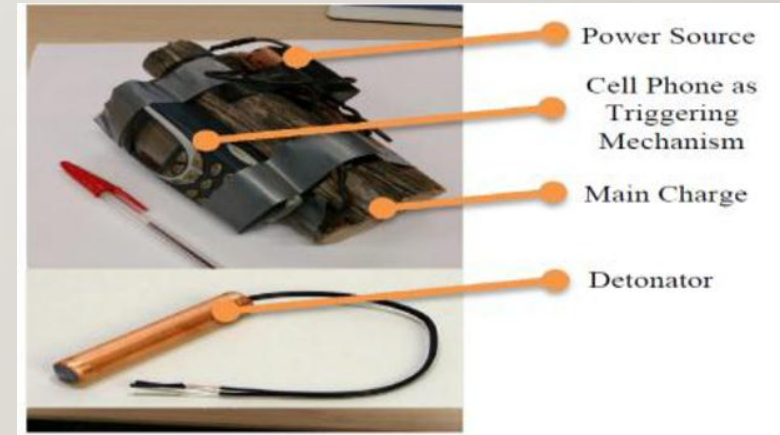
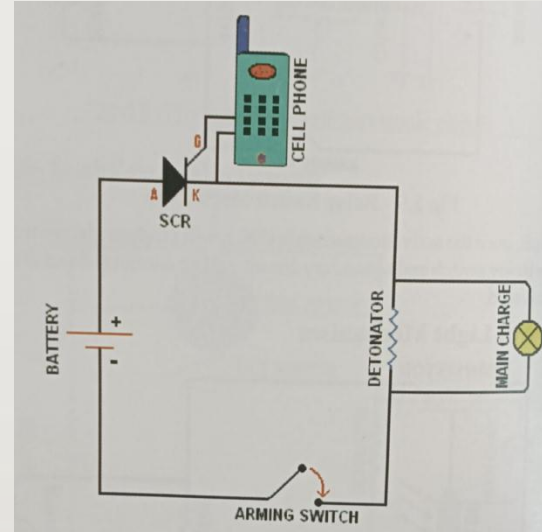
### Exposure to Light Mechanism:-

- A Light Dependent Resistor (LDR) is used in this type of circuit made of a high resistance semiconductor. If light falling on device is of high enough frequency, photons absorbed by the semiconductor band.
- The resulting free electron and its hole partner called charge carriers conduct electricity, thereby lowering resistance causing circuit to be completed and this will pass the voltage to the base of NPN transistor.
- The transistor will amplify the given electrical signal and it gives current to the detonator.
- The detonator explodes and produces shock waves which will blast the main charge.



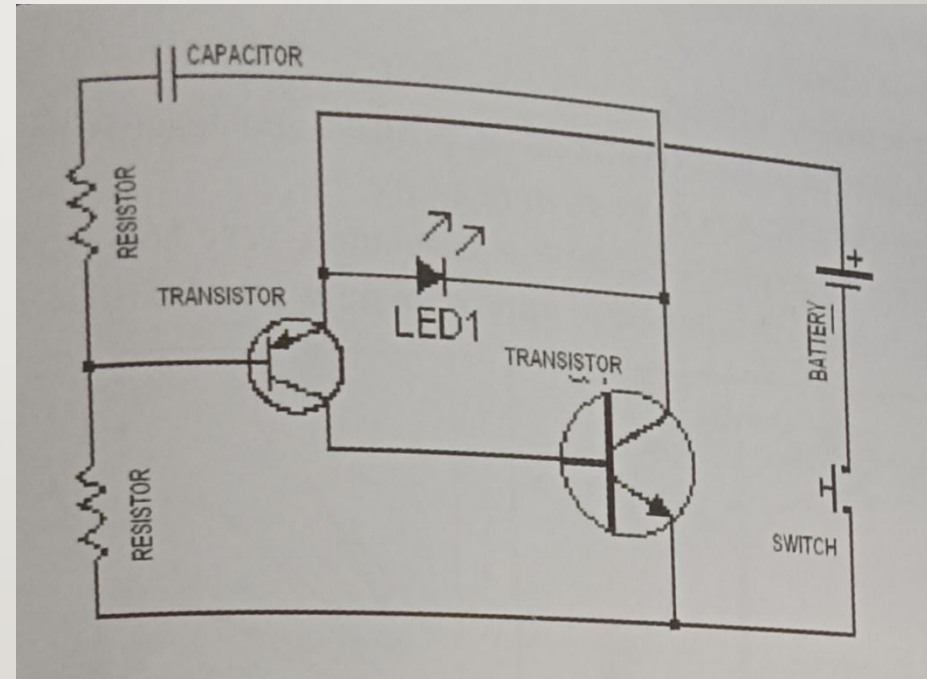
## Self holding Mechanism:

- A Silicon-Controlled Rectifier (or semiconductor-controlled rectifier) is a four layer state device that control current. An SCR is a type of Rectifier, controlled by logic gate signal.
  - It is a four layer three terminal device.
- P-type layer act as a anode and an n-type layer act as cathode; the p-type layer close to the n-type(cathode) acts as a gate.
- In normal “OFF” state, the device restricts the curront to the leakage current.
- When the cell phone is activated, gate to cathode voltage exceeds a certain threshold, the device turn “ON” and conducts current which explodes detonator.



### IR Mechanism:-

- Infrared radiation is an electromagnetic radiation whose wavelength is longer than visible light, but shorter than the microwaves.
- In this type of device an Infra Red LED is used to transmit infrared radiation.
- A receiver circuit contains a NPN –phototransistor which will activate as it receives infrared waves from transmitter. Thus the circuit gets completed and the electrical signal will be amplified by the amplifier.
- The amplified signal activates the relay which acts as a switch connected with the detonator.





**THANK YOU...**