

# MOBILE & PORTABLE RADIOGRAPHY

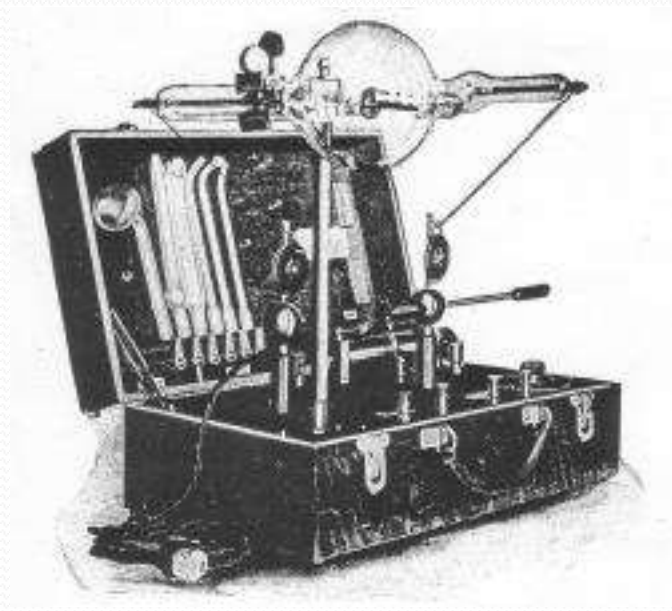
# Introduction

- In-patients who could not leave their beds
- Surgeons who required x-ray control guidance during the course of their work in the operation theatre

# PORTABLE X-RAY

- Portable - can be carried by one able bodied person at a time.
- Can be taken around the hospital, some place distant from hospital or even to a patient's home.
- Simple

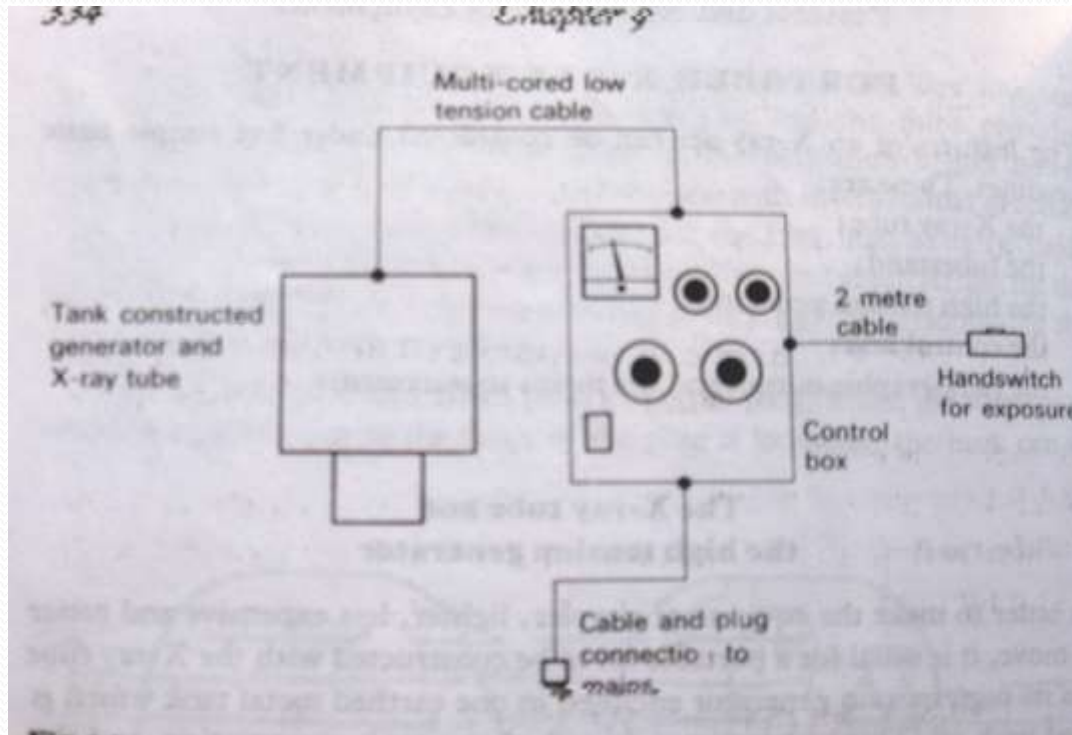
# Portable radiographic units 1912 and now



# COMPONENTS

- X-ray tube and high tension generator are enclosed in one oil filled tank, described as tank construction and the whole enclosure called the tube head.
- Control unit

# Schematic diagram of components of portable unit



# MOBILE X-RAY

- Mobile means capable of being moved.
- Mounted on wheels with the motion brake provided.
- Larger and heavier than portable sets and need to be motorized or pushed by human power.

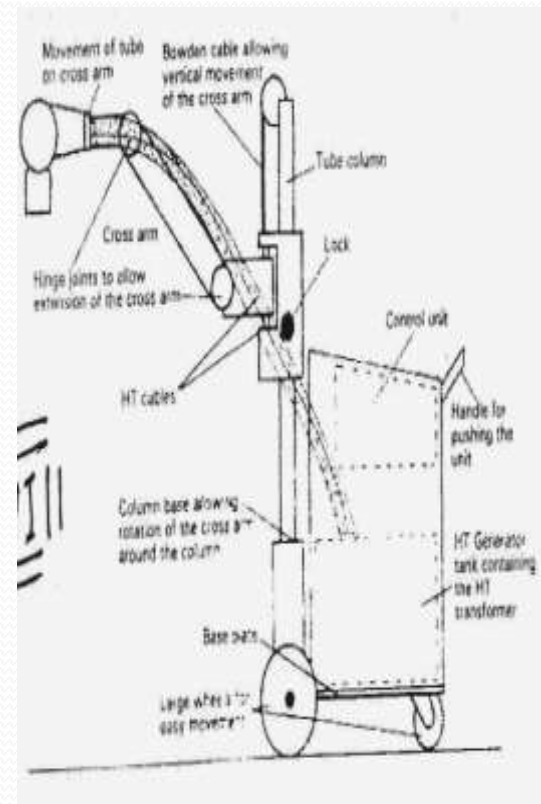
# Mobile units in 1940-1955 and now





# COMPONENTS

- A wheeled base
- High tension generator
- Control panel
- Supported X-ray tube



# MOBILE X-RAY CLASSIFICATION

By two ways:

1. **By power supply:**

- Capacitor discharge unit
- Battery powered unit

2. **By output:**

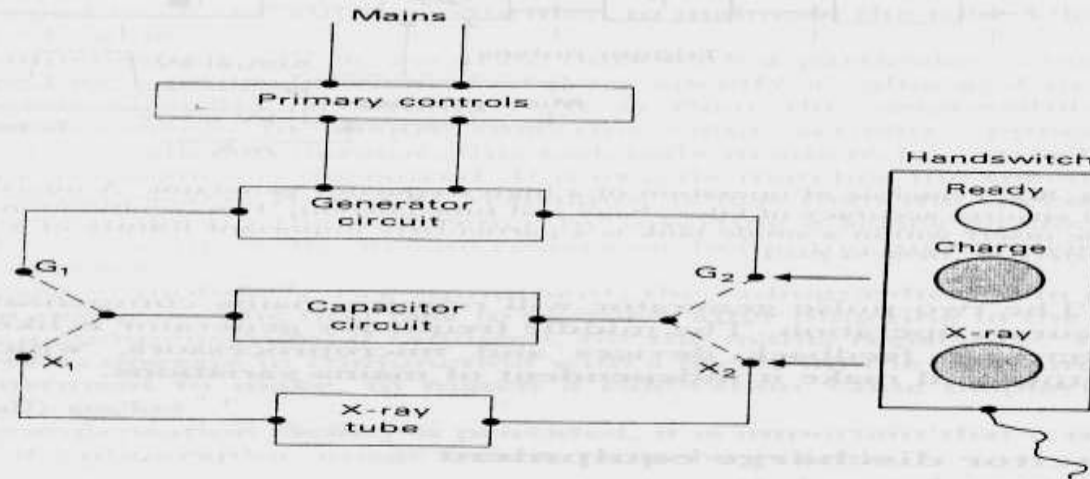
- Low Power Mobiles: 10 to 30mA and 40 to 90 kVp.
- Average Power Mobiles: 100 to 150 mA and 40-95 kVp.
- High power mobiles : upto 300 mA and 125 kVp.

# CAPACITIVE DISCHARGE UNIT

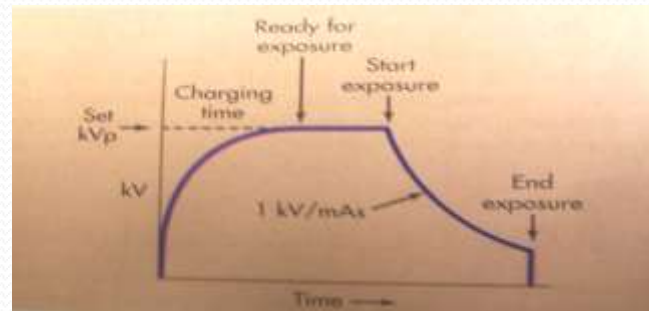
## Principle:

- When charge circuit is activated, voltage from HTT charges a capacitor up to the kilo voltage required for the exposure.
- The capacitor becomes source of power for x ray exposure. It is disconnected from the charging circuit and connected to the x ray tube for exposure.

# The working of capacitor discharge unit



**Fig. 8.2** Outline of operation of a capacitor-discharge generator. Prior to exposure, switches  $X_1$  and  $X_2$  are open,  $G_1$  and  $G_2$  are closed by the charge control. Operation of the X-ray exposure control opens  $G_1$  and  $G_2$  to isolate the charged capacitor, then closes  $X_1$  and  $X_2$ , to discharge it through the X-ray tube.



# BATTERY POWERED UNIT

- Also called cord less mobile unit.
- Ni-Cd batteries are used as a source of energy for x ray exposure .
- The generator is referred to as constant potential generator (CPG).
- Power supply is used to charge the batteries.
- The batteries produces low voltage DC charge.

# GENERAL CONSIDERATION

- The exposure hand-switch cable must be at least 2 m long to allow radiographer to stand distant from irradiated patient
- Lead protection must be used for personnel not involved with the examination
- Protect other staff not involve with the examination

THANK YOU