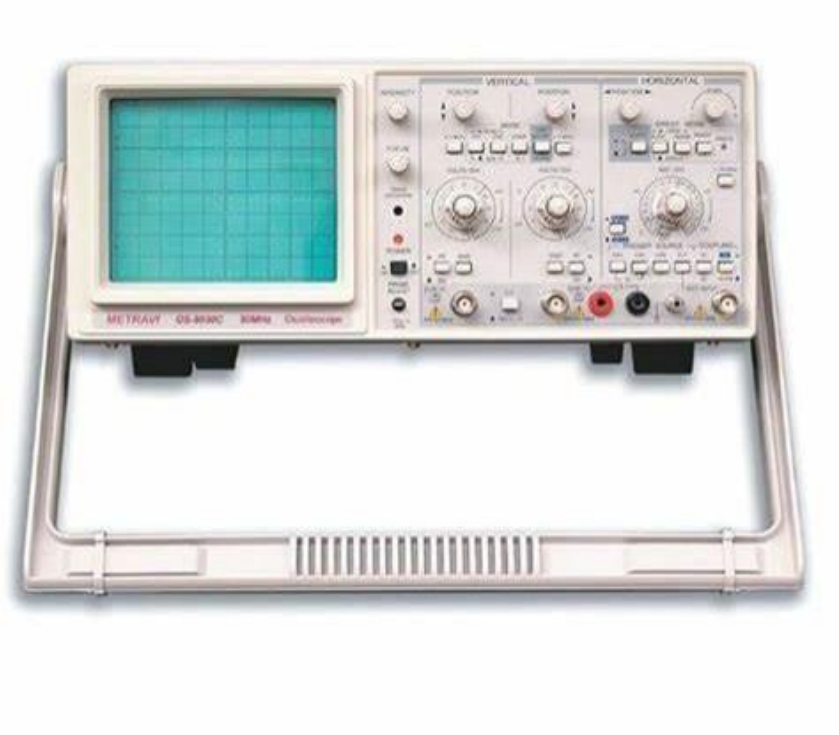
DEPARTMENT OF PHYSICS

MAR THOMA COLLEGE FOR WOMEN, PERUMBAVOOR

CATHODE RAY OSCILLOSCOPE



A cathode ray oscilloscope (CRO), also known as an oscilloscope or scope, is a widely used electronic test instrument. It allows you to visualize and analyze electrical signals as waveforms on a graphical display. A basic explanation of its components and how it works:

1. Cathode Ray Tube (CRT): The core component of a CRO is the CRT. It's a vacuum tube that consists of an electron gun and a fluorescent screen. The electron gun emits a focused beam of electrons towards the screen.

2. Deflection Plates: Two sets of deflection plates, horizontal (X) and vertical (Y), are placed between the electron gun and the screen. These plates can control the movement of the electron beam.

3. Input Signal: You connect the electrical signal that you want to analyze to the input of the oscilloscope. This signal is typically applied to the vertical deflection plates.

4. Timebase: The CRO also has a timebase circuit that controls the movement of the electron beam horizontally. It determines the time scale on the screen.

- When you apply an electrical signal, the vertical plates control the beam's position on the screen, creating the vertical representation of the signal's amplitude.

- The timebase circuit controls the beam's horizontal movement, creating the horizontal representation of time.

- As the beam moves across the screen, it draws the waveform of the input signal, with time on the x-axis and amplitude on the y-axis.

- The result is a visual representation of the signal's behavior over time. This allows you to observe various characteristics of the signal, such as frequency, amplitude, phase, and distortion.

Oscilloscopes are invaluable tools for electronics engineers and technicians for troubleshooting, analyzing circuits, and observing the behavior of electronic signals. They come in various types and sizes, ranging from small handheld units to large, sophisticated laboratory-grade instruments.