Tutorial On CRO (Cathode Ray Oscilloscope) Working and Applications

Introduction:

➢The CRO stands for a cathode ray oscilloscope. In modern electronics, the CRO plays an important role in the electronic circuits. It is typically divided into four sections which are display, vertical controllers, horizontal controllers, and Triggers. Most of the oscilloscopes are used the probes and they are used for the input of any instrument. We can analyze the waveform by plotting amplitude along with the x-axis and y-axis.

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What Is A CRO

- The cathode ray oscilloscope is an electronic test instrument.
- It is used to obtain waveforms when the different input signals are given.
- In the early days, it is called as an Oscillograph.
- The oscilloscope observes the changes in the electrical signals over time.

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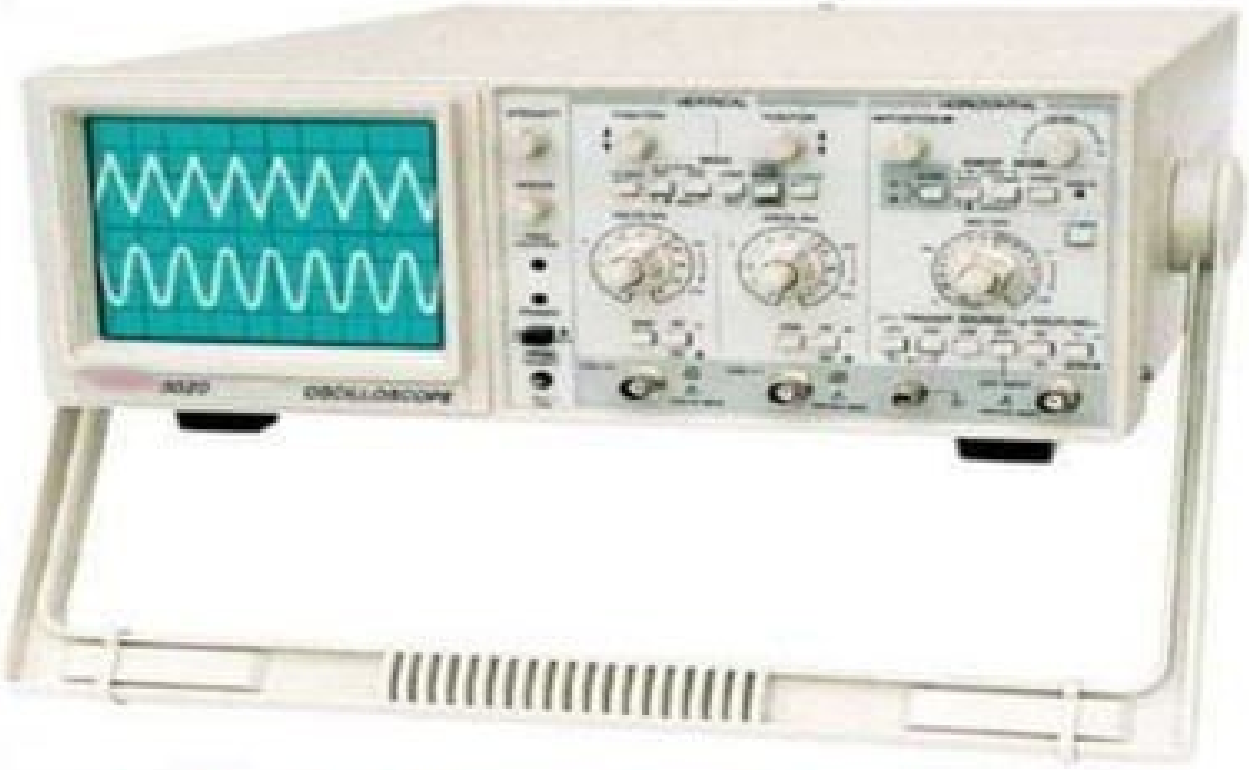
What is a CRO



Cathode Ray Oscilloscope

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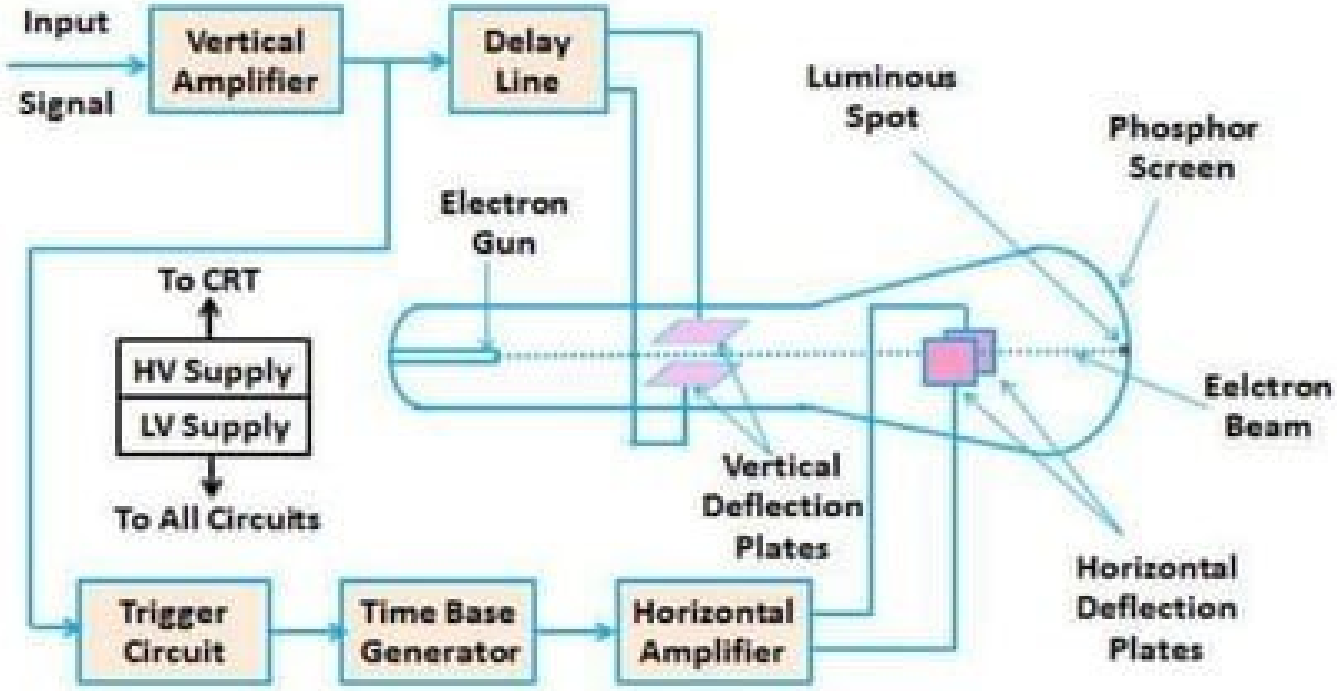
Block Diagram of CRO



Block Diagram of Cathode Ray Oscilloscope (CRO)

Block Diagram of CRO

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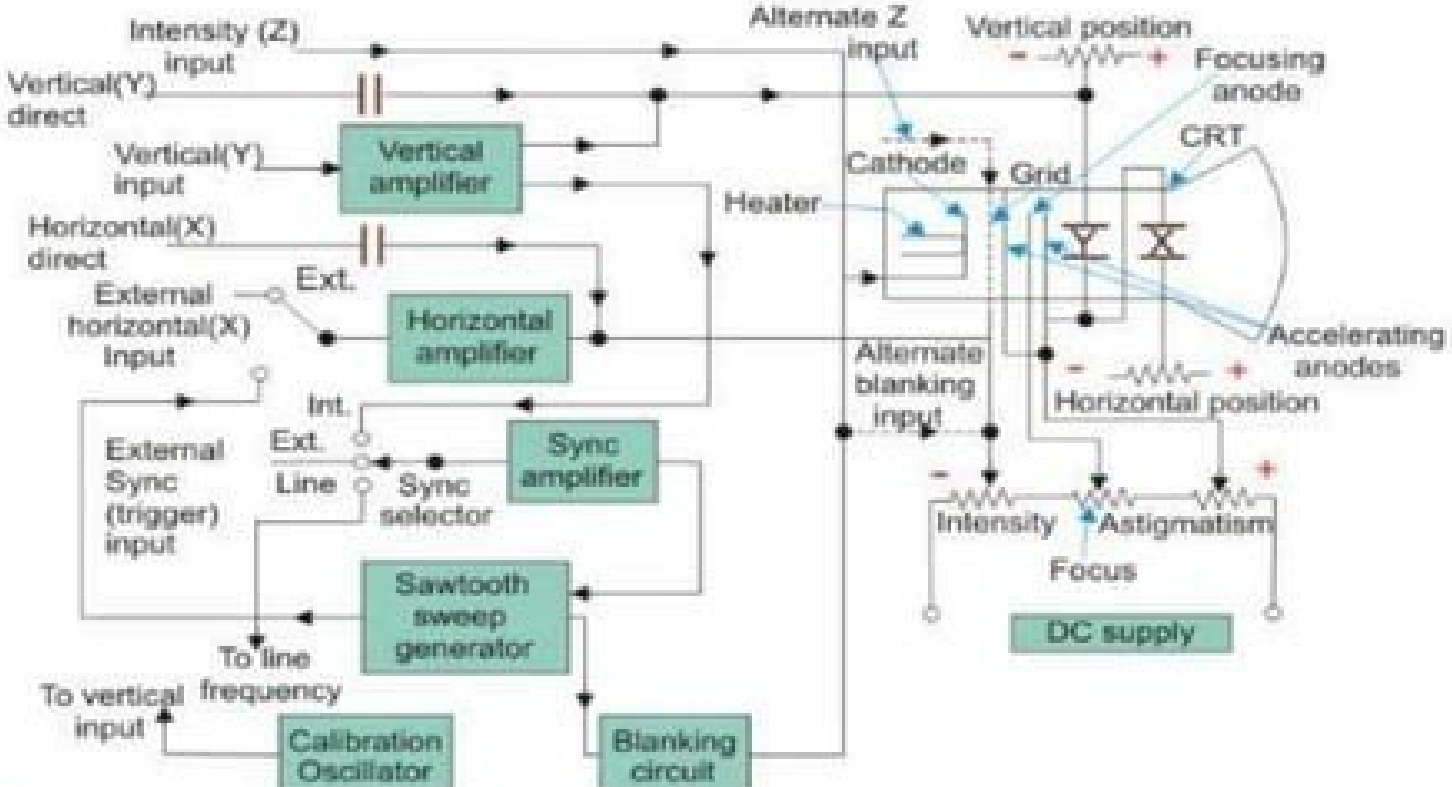
Working of CRO

- The following circuit diagram shows the basic circuit of a cathode ray oscilloscope.



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Working of CRO

Vertical Deflection System

- The main function of this amplifier is to amplify the weak signal.
- so that the amplified signal can produce the desired signal.
- To examine the input signals are penetrated to the vertical deflection plates through the input attenuator and number of amplifier stages.

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Horizontal Deflection System

- The vertical and horizontal system consists of horizontal amplifiers to amplify the weak input signals.
- It is different to the vertical deflection system.
- The horizontal deflection plates are penetrated by a sweep voltage that gives a time base.
- By seeing the circuit diagram the sawtooth sweep generator is triggered by the synchronizing amplifier.

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Horizontal Deflection System

- While the sweep selector switches in the internal position.
- So the trigger saw tooth generator gives the input to the horizontal amplifier by following the mechanism.
- Here we will discuss the **four types of Sweeps.**

  - Recurrent Sweep
  - Triggered Sweep
  - Driven Sweep
  - Non-Saw Tooth Sweep

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Recurrent Sweep

- As the name, itself says that the saw tooth is respective that is a new sweep is started immodestly at the end of the previous sweep.
- If the input signal is periodic, the sweep repetition rate can be adjusted to display a few cycles of the waveform.
- They have a few (widely spaced) frequency ranges.
- Relatively wide-range continuous frequency control within a given range.

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Triggered Sweep

- Sometimes the waveform should be observed that it may not be predicted.
- Thus the desired that the sweep circuit remains inoperative .
- The sweep should be initiated by the waveform under the examination.
- In these cases, we will use the triggered sweep.
- A triggered sweep starts at a selected point on the signal, providing a stable display.

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Driven Sweep

- In general, the drive sweep is used when the sweep is a free running.
- But it is a triggered by the signal under the test.
- Adriven sweep is triggered either by a command given by the device t hat controls the appearance of the process.
- A delay line is used to observe the initial part of the electric process, which precedes the triggering of the driven sweep.

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Applications of CRO

- Voltage measurement
- Current measurement
- Examination of waveform
- Measurement of phase and frequency