

# ■ WHAT IS AN OSCILLOSCOPE?

**Introduced by German Physicist Ferdinand Braun in 1897.**

"THE OSCILLOSCOPE IS BASICALLY A GRAPH-DISPLAYING DEVICE - IT DRAWS A GRAPH OF AN ELECTRICAL SIGNAL."

ELECTRICAL SIGNAL



VISUAL SIGNAL

-ALSO CALLED ELECTRON BEAM VOLTMETER.

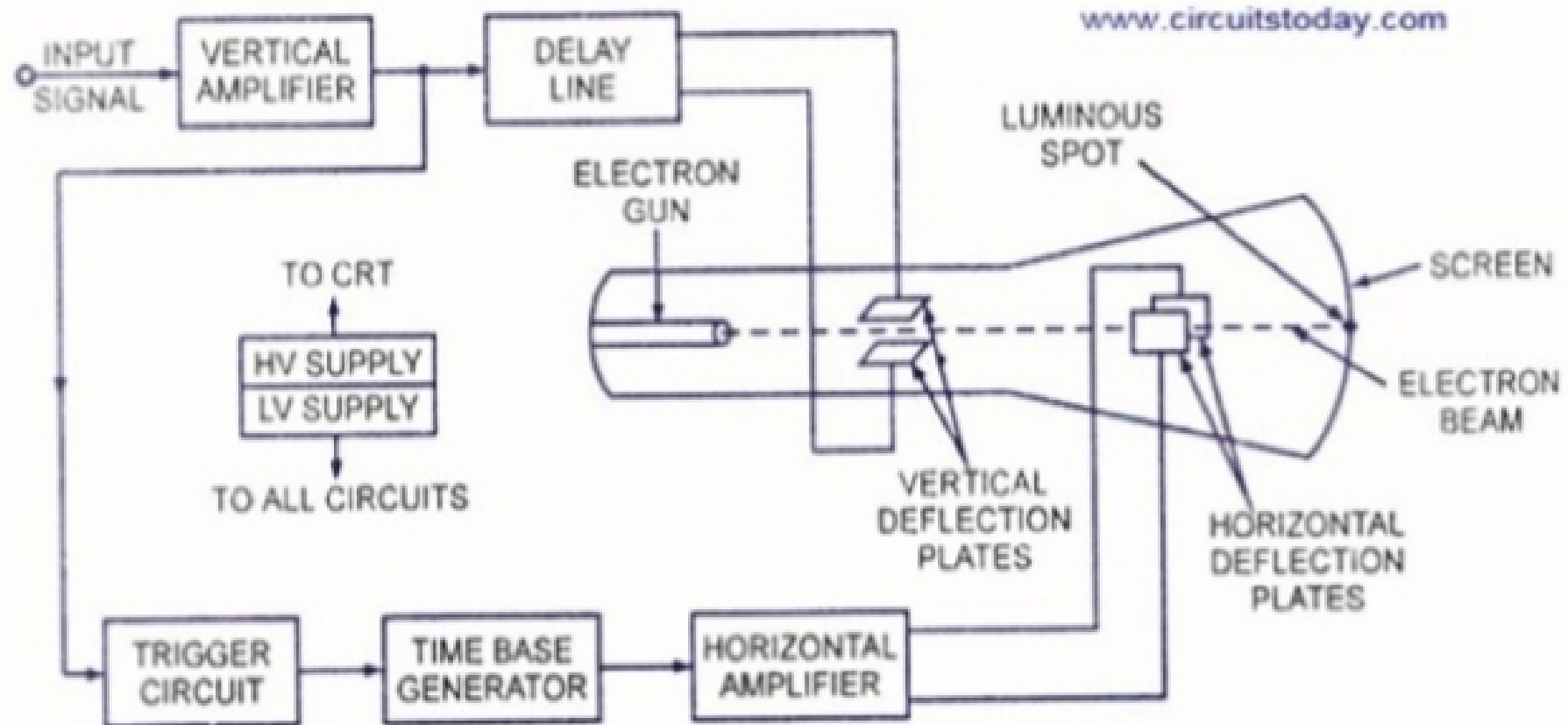
# TYPES

- **Analog**
- **Digital**

"An **analog** oscilloscope works by directly applying a voltage being measured to an electron beam moving across the oscilloscope screen."

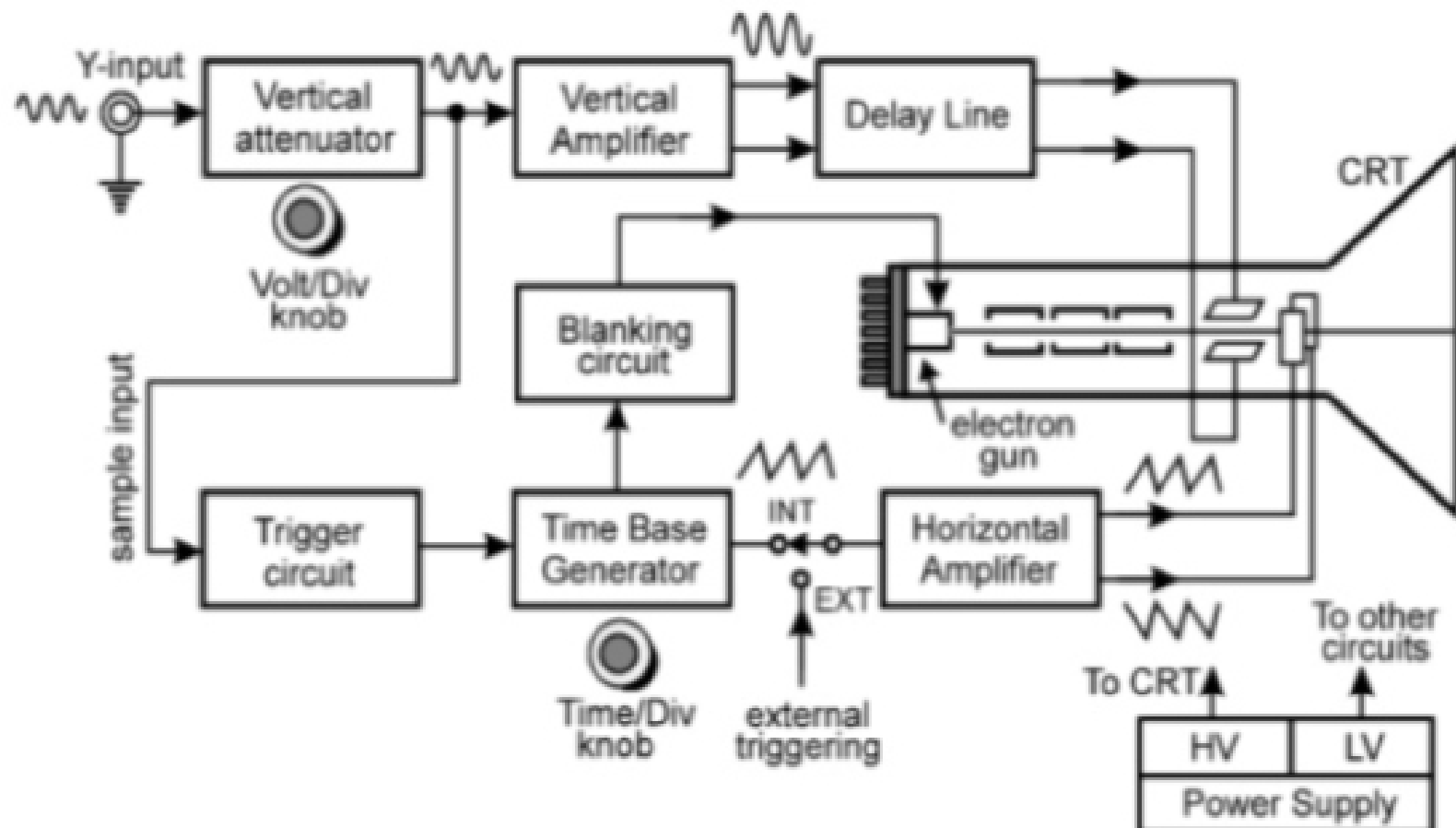
"In contrast, a **digital** oscilloscope samples the waveform and uses an analog-to-digital converter (or ADC) to convert the voltage being measured into digital information."

# BLOCK DIAGRAM



*Block Diagram of a General Purpose CRO*

# ANOTHER REFERENCE DIAGRAM



# Major blocks in Block Diagram earlier are,

- 1. CRT
- 2. Vertical amplifier
- 3. Delay line
- 4. Time base
- 5. Horizontal amplifier
- 6. Trigger circuit
- 7. Power supply

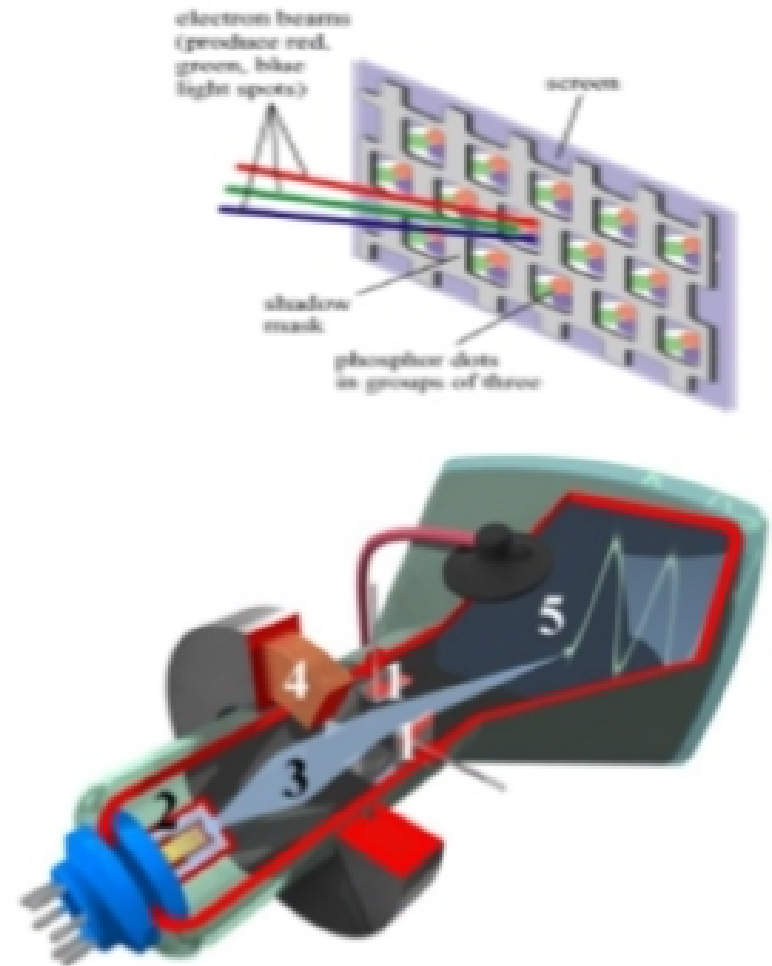
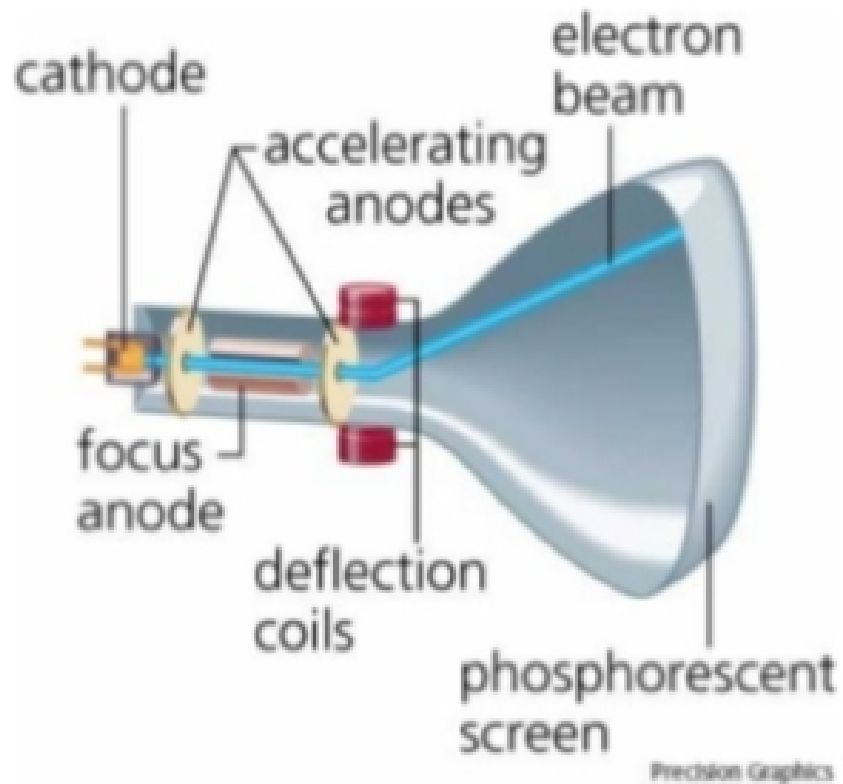
Let's get familiar to the above  
terms.

# 1.CRT

- **CRT stands for Cathode Ray Tube.**

Cathode Ray Tube is the heart of the oscilloscope. When the electrons emitted by the electron gun strikes the phosphorus screen of the CRT, a visual signal is displayed on the CRT.

# CRT (DIAGRAMATIC ELABORATION)



## 2. VERTICAL AMPLIFIER

- In Vertical Amplifier, The input signals are amplified by the vertical amplifier. Usually, the vertical amplifier is a wide band amplifier which passes the entire band of frequencies.
-



## 3. DELAY LINE

- Delay Line as the name suggests that, this circuit is used to, delay the signal for a period of time in the vertical section of CRT. The input signal is not applied directly to the vertical plates because the part of the signal gets lost, when the delay Time not used. Therefore, the input signal is delayed by a period of time.

## 4. TIME BASE CIRCUIT

- Time base circuit uses a uni junction transistor, which is used to produce the sweep. The saw tooth voltage produced by the time base circuit is required to deflect the beam in the horizontal section. The spot is deflected by the saw tooth voltage at a constant time dependent rate.

## 5. HORIZONTAL AMPLIFIER

- In Horizontal Amplifier, The saw tooth voltage produce by the time base circuit is amplified by the horizontal amplifier before it is applied to horizontal deflection plates.

---

## 6. TRIGGER CIRCUIT

- Well when an signal is applied to the input of the CRO we require a mechanism that tells the CRO to trace the input signal on the display. This mechanism is called the CRO Triggering Circuit.

---

## 7. POWER SUPPLY

- The Power supply voltages require by CRT, horizontal amplifier and vertical amplifier are provided by the power supply block.

# Power supply block of oscilloscope is classified in to two types

- (1) Negative high voltage supply
  - (2) Positive low voltage supply
- 
- The voltages of negative high voltage supply is from -1000V to -1500V and the range of positive voltage supply is from 300V to 400V approx.

## USES.

- As picture Tube in TV
- Radar System to detect enemy aircraft.
- To measure voltage or current, the drop across a resistor is measured.
- To study waveforms: A visual display is seen.
- Measurement of frequency and phase angle.
- etc.