

Cathode-Ray Tubes

A cathode ray tube (CRT) is an electronic device that produces images on a screen by firing electrons at phosphors coated onto the inside of the tube. It was the primary type of display technology used in television up until the mid-1990s, and despite being supplanted by newer technologies it is still used in some applications such as medical imaging and oscilloscopes. The term "cathode ray" is derived from the fact that the electron beam within the CRT is generated by a negative electrode termed a cathode.

The cathode of a CRT is usually made from a metal filament heated to very high temperatures through an electric current. When electrons pass through this heated filament, they enter the vacuum within the CRT and travel down an electrically charged line that runs through the center of its neck. They then enter the gun which shapes and focuses them into beams, before striking phosphorous coatings located in each corner of the display's inner surface, where they excite other electrons and cause them to briefly illuminate when struck.

In addition to providing images, CRTs can also act as oscilloscopes for measuring electrical signals with their beam probes. This involves use of special electrodes at different points along the curves displayed onscreen to help identify pulses or other specific waveforms. For example, if waves are amplified enough times they can be seen directly on screen using a probe connected to one section of it powerful enough draw out all their points simultaneously in real-time, while measuring them at individual points throughout their duration; thus making precise measurements possible without using costly external equipment like spectrum analyzers.

The energy efficiency and image quality (or resolution) of modern displays now surpasses what CRTs could offer due to advancements in plasma or LED technology since their introduction in 1995; yet even after nearly two decades development continues into researching new applications for modifying existing CRTs for better performance or innovating ways for utilizing them including virtual reality headsets and confocal microscopy.