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Assignment 1
Video Preservation 1
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The CRT Monitor and its Role in Digitizing Analog Tapes

The main components within the casing of the Cathode Ray Tube monitor include the Cathode Ray Tube (CRT) itself and an electronic circuit board for power and signal. The glass envelope of the CRT is held in vacuum and contains a filament that is heated, not unlike a lightbulb. The heated filament functions as a cathode, and electrons are concentrated via focusing and accelerating anodes. Magnetic deflection is used to “steer” the beams toward the screen. A color CRT has three electron emitters - one each for red, green, and blue – while a black and white monitor will have a single electron beam. The electron beams are focused and moved horizontally and vertically by sets of copper coils.¹ A shadow mask separates each of the colored beams before hitting the phosphor-coated screen. The magnetic dependency makes the system vulnerable to interference,² which can result in color purity distortion, and is just one factor to consider when ensuring an optimal viewing environment.

The CRT monitor is an important element of the digitization process, as it allows for viewing of the video signal as it was originally created and intended for viewing. A test pattern generator is also an essential element, allowing for adjustments including hue, brightness, and contrast. Proper calibration of the CRT is paramount. A monitor with blue-only, underscan, and H-V delay features will aid in the calibration process. ‘Blue only’ allows for adjustment of chroma and phase.³ ‘Underscan’ allows for viewing the full range of scan lines of the video signal, and ‘H-V delay’ allows for checking vertical and horizontal sync.⁴ These features help to identify possible signal errors. While the viewing monitor is the most obvious CRT component of the digitization rack, analog waveform monitors and oscilloscopes also utilize CRT monitors.

¹ Chi-Tien Lui and Raphael Shirley, *Fundamentals of the Cathode Ray Tube*, 138

² Samuel Goldwasser, *TV and Monitor*

³ Glenn Chan, *How to calibrate a broadcast monitor*

⁴ Rosie Rowe, *Building a Video Preservation Rack*

References

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