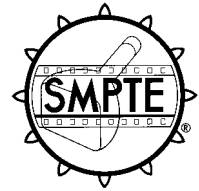


SMPTE ENGINEERING GUIDELINE

EG 1-1990

Revision of ECR 1-1978

Alignment Color Bar Test Signal for Television Picture Monitors



Page 1 of 3 pages

1 Scope

This guideline specifies the purpose, format, and usage of a television picture monitor alignment color bar test signal with chroma set and black set signals.

2 Purpose

2.1 The alignment color bar test signal is intended to standardize the adjustment of chroma gain, chroma phase, and black level monitor controls.

2.2 Chroma gain and chroma phase for picture monitors are conventionally adjusted by observing the standard encoded color bar signal (see figure 1) with red and green monitor guns switched off. The four visible blue bars are adjusted for equal brightness. This procedure is prone to error because of the subjective judgment necessary and especially because the blue bars are widely separated on the screen. The use of the chroma set signal portion of the alignment color bar test signal greatly increases the accuracy of this adjustment since it provides a signal with the blue bars to be matched vertically adjacent to each other. Because the bars are adjacent, the eye can easily perceive any difference in brightness. It also eliminates effects due to shading or purity from one part of the monitor to another.

2.3 Black level for picture monitors is conveniently adjusted by observing a known black portion of the signal and matching it to a blanked area of the signal. This procedure is prone to error because of the subjective judgment necessary to make the match. The use of the black set signal portion of the alignment color bar test signal greatly increases the accuracy of this adjustment since it provides a positive go-no-go criterion for the proper setting. It also minimizes errors due to variations in ambient light.

3 Format

3.1 Figure 1 shows the appearance of the EIA Standard RS-189-A, Encoded Color Bar Signal, on a picture monitor. Figure 2 shows the appearance of the alignment color bar test signal on a picture monitor. Note that figure 2, the Alignment Color Bar Test Signal, is the same as figure 1 except for the addition of chroma set signal (X-X') and black set signal (within Y-Y').

3.2 The chroma set signal is a small band of bars displayed in place of the bottom portion of normal color bars. The bars are displayed in reverse order. Only the four bars which contain blue are necessary; the remaining three bars may be black. Figure 3 shows the appearance of one line of the chroma set signal on a waveform monitor.

3.3 The black set signal is located in the bottom righthand portion of the raster. Two bars, one slightly whiter-than-black and the other slightly blacker-than-black, are included. Figure 4 shows the appearance of one line of the black set signal on a waveform monitor.

4 Usage

4.1 To set chroma gain and phase, the picture monitor red and green guns are switched off. Chroma gain is adjusted by matching the brightness of the outer left or right main blue bar with the chroma set bar just below. In a similar manner, chroma phase is adjusted by matching the brightness of either center main blue bar with the chroma set bar just below.

4.2 To set black level, the picture monitor brightness control is adjusted so that the whiter-than-black bar is visible with respect to the black surround, but the blacker-than-black bar is not visible.

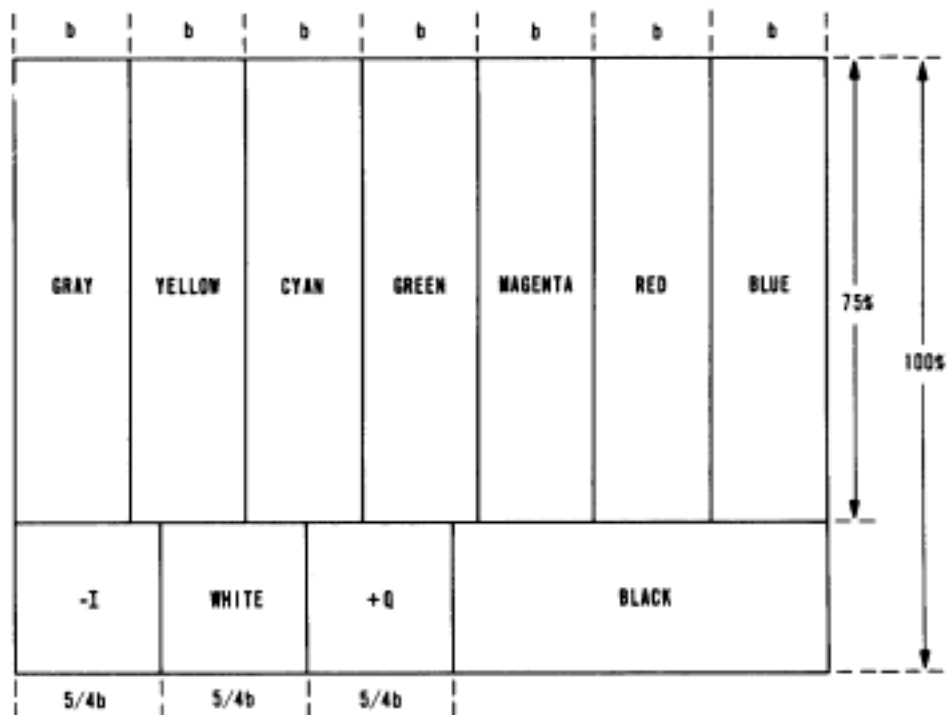


Figure 1 – EIA standard RS-189-A, Encoded color bar signal

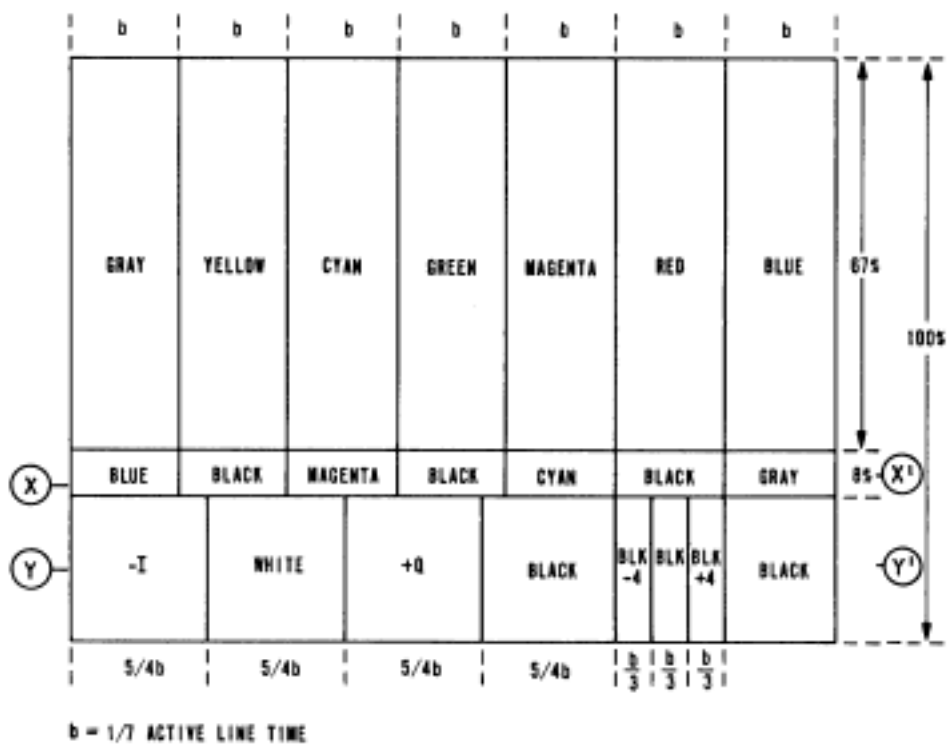


Figure 2 – Alignment color bar test signal

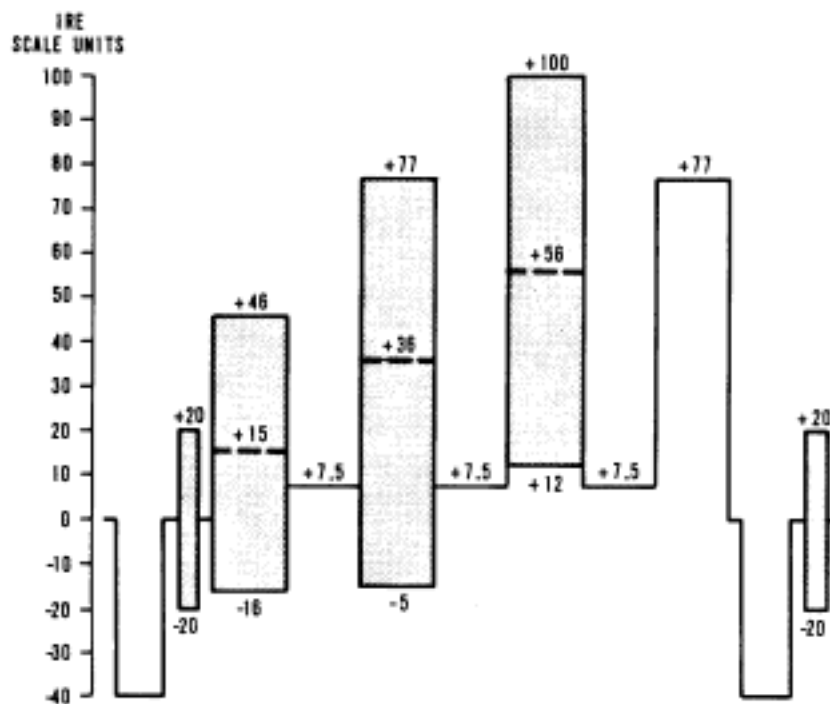


Figure 3 – One line of chroma set signal, X-X'

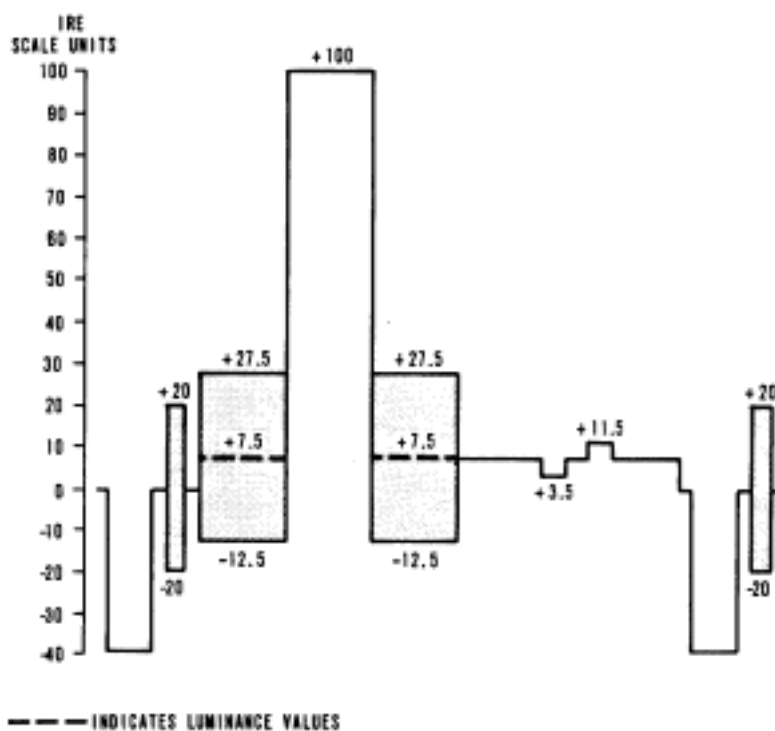


Figure 4 – One line of black set signal with -I, +Q, and white reference, Y-Y'