

## COLOR BARS

### BETTER LIVING THROUGH NTSC MONITOR ADJUSTMENT

Everyone who works with video has had the experience of images looking one way on one monitor and another way on another monitor. Monitor calibration — making colors look the same wherever you see them — is a challenge to consumers and professionals alike.\*

To calibrate a monitor to its “correct” setting takes a few things. First, you need to have the tools (knobs) to adjust these settings; and second, you need a *standardized image* that gives you something consistent to set up.

Thus the invention of *color bars*. These are not just pretty colors, but a precisely engineered pattern of luminance and chrominance values. There are color bar *generators* (either in hardware or software) which output this pure color bar signal by which equipment can be adjusted. On computers, there are color bars image *files* (usually PICT or TIFF) that when viewed in applications also allow for connected monitor adjustment. There is an important distinction between these “pure” color bars and those that have been recorded onto videotape. “Recorded” bars may be distorted by numerous variables, and would only be used for *temporary* monitor adjustment, to view a specific video at its intended appearance.

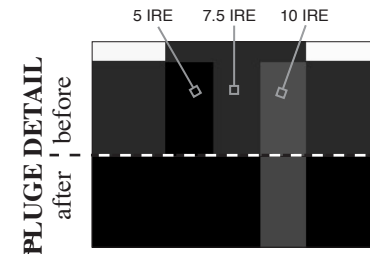
#### Monitor Adjustment: Step-by-Step

Here are a few basics of adjusting your monitor, using the color bar signal, to achieve the desired professional monitor set-up required to make proper aesthetic adjustments to your program material. Remember, a video signal is made of luminance and chrominance. (If you don’t remember, go back to page 120.) Though they may be labeled using slightly different terms, both professional monitors and consumer TVs have knobs that must be adjusted in a particular order:

**1. Brightness** (or “set-up” or “black level”) controls the luminance part of the signal. To tweak luminance, set the monitor to monochromatic (black and white) if possible. While there are different ways to describe these values, the most common is an **IRE unit**:



\* This section is about NTSC monitors. Computer monitors are an entirely different ball of wax.

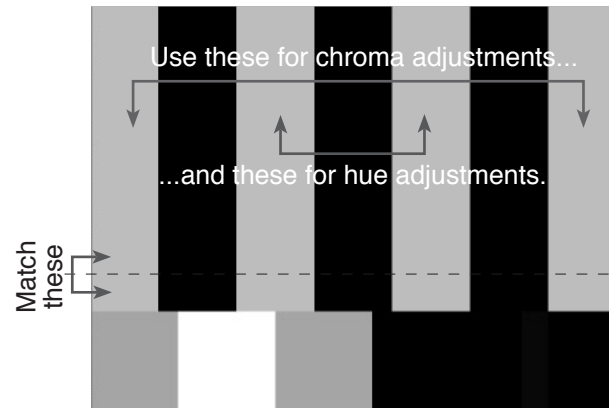


a percent value from 0 (“black”) to 100 (“white”). But 0 is too black for a video monitor (white is just right at 100); due to particulars of NTSC video signals, perfect *video black* is 7.5 IRE.

At the bottom right hand side of the color bars are three narrow bars, known as the *pluge*.\* The bar on the left is blacker than video black (5 IRE) and the bar on the right is lighter than video black (10 IRE). The bar in the middle is perfect video black. Adjust the **brightness** knob until the left bar and the middle bar look the same, but you can still distinguish the bar on the right. *Simple*.

**2.** At the lower left side of the color bar pattern is a white bar. Turn the **contrast** (or “gain” or “white level”) knob until this white bar overexposes. This will look like the white is spilling into the surrounding area (“blooming”). As soon as the white hits this point, back it off until it doesn’t. You’ve now set the luminance properly.

**3. Saturation** (or “chroma saturation” or “chroma”): To get the colors set up correctly on the monitor, you don’t actually want to see all the colors; turn on the “blue gun” only. The seven color bars represent various combinations of colors created by the electron guns in the monitor. Adjust the **chroma** knob until the bars on the *two ends* match the color and brightness of the little horizontal bars beneath them.



With only the blue-gun turned on (and thus, the red and green guns off), the monitor looks like this: bars of light blue and black bars. To adjust chroma and hue, you are concerned with the look of the tall blue bars, and the small horizontal bars beneath them.

**4. Hue:** Still with the blue gun only, turn the **hue** knob to adjust the *middle pair* of blue bars until they match the color and brightness of the bars beneath them. When properly set up, the bars should look like the illustration at left, with no break between the tall bars on top and the smaller horizontal bars beneath.

\* Geek trivia: PLUGE began as an acronym, standing for Picture Line-Up Generation Equipment.