



Santa Ynez Valley

Camera Club

Digital Stuff by Frank Swanson

Calibrating a Monitor

You would think that a subject like calibrating a monitor would be a straightforward discussion of following the installed software instructions and performing the appropriate actions when prompted. Unfortunately this does not turn out to be the case. For purposes of these notes, I will discuss calibrating a monitor as it applies to my system. There are a couple of notes that are cautions against taking a wrong approach.

Calibration Tools

For calibrating my monitor, I use the Pantone ColorVision PhotoCAL Version 2.7. This product is currently available as ColorVision PhotoCAL retailing for approximately \$140.00. Pantone also offers a less expensive version called ColorPlus that retails for approximately \$100.00. The basic difference is that ColorPlus performs the adjustment and calibration steps via software without involving the user whereas PhotoCAL provides a user interface requiring inputs to set most of the monitor functions such as luminance, brightness and the white point by adjusting the individual colors. There are other relatively inexpensive monitor calibration tools available such as MonicoEZcolor and ColorVision Printflex.

First Things First

Out of the box, the first task is software installation. This is routine for both Mac and PC devices. At completion, there will be a desktop icon labeled PhotoCAL 2.7 or something similar depending on which product and version is used. To begin the calibration, hook the sensor into the computer's USB port and initiate the software by double clicking the PhotoCAL icon.

Note: before actually beginning the calibration make sure that the monitor is clean of dust, grease and cat hair. Also try to perform the calibration after

the monitor has been on for a period of time (a half hour or more) and in room light that is similar to the lighting that will be experienced during digital image processing.

The Monitor

The initial screen is a welcome message that discusses what the calibration involves. The next screen asks you to select the type of monitor to be calibrated, which will be either a Cathode Ray Tube (CRT) or Liquid Crystal Display (LCD). I use a laptop as my desktop computer but for performing digital image processing I use a NEC MultiSync FE 950+ CRT monitor rather than the laptop's LCD display. This is due to the generally poor color control, viewing angle effects and quality of laptop LCD displays compared with the performance of a good flat screen CRT monitor with individually controllable functions, high brightness and small dot pitch resolution. Currently available stand-alone LCD monitors offer performance similar to a good quality CRT monitor while consuming less desk space however typically at a significantly higher price for equivalent quality.

Note: If you are calibrating an LCD display **do not** attach the sensor suction cups directly to the screen. CRT monitors have a glass surface, which will not be damaged by attaching and detaching the sensor suction cups. All LCD monitors (that I know of) have a flexible film surface, which can be damaged by attaching and detaching the sensor suction cups.

Subsequent Calibration Steps

- The next screen asks you to select a gamma (basically a contrast ratio). Typically for a Macintosh system, the gamma selection will be 1.8 and for a Windows system the gamma will be 2.2.
- The next screen asks you to select a color temperature, which is somewhat system dependent. I use 6,500°K, a cool white setting.
- The next screen begins the actual calibration process. Initially you are instructed to set the contrast to its maximum setting to maximize the monitors white luminance.
- The next screen involves adjusting the monitor brightness to result in four black boxes being (barely) visible. Remember, that during this step, brightness is being set with contrast at its maximum setting. This will be changed during a subsequent calibration step.
- You are now asked to identify which type of RGB control your monitor has. The three choices are individual RGB controls, preset

- controls or none. My CRT monitor has individual RGB controls represented by adjustable color bars for Red, Green and Blue settings.
- The next screen asks you to attach the sensor in the position indicated by the PhotoCAL on-screen display. Since most monitor control panels are displayed in the center of the monitor screen I will move the PhotoCAL display out of the center, normally to the upper left. Leave space such that all three sensor suction cups can be firmly attached to the glass surface of the CRT monitor. If you are calibrating a LCD monitor, set up the sensor and balancing weights so that they do not interfere with the monitor control panel.

Note: Make sure the Spyder sensor is flat against the monitor surface. If the sensor portion is not flat against the surface, any stray light will cause erroneous readings with spectacularly interesting color shifts.

- At this point, the sensor will perform a number of basic color measurements and will provide a luminance (brightness) reading. At the completion of the sensor color measurements, you will be requested to adjust the monitor contrast setting to result in a luminance reading between 85 and 95. I try to get a setting as close to 94 as possible. This may take a couple of iterations involving bringing up the monitor control panel, adjusting the contrast, closing the monitor control panel, taking a new reading via refresh and repeating as necessary.
- The final calibration step is adjusting the Red, Green and Blue (RGB) controls to get them all as close as possible to the same output. This is a critical step in establishing the white point setting. Follow the PhotoCAL instructions and iteratively make RGB adjustments until the difference is less than 0.5. I try to get the difference as close to zero as possible. When completed move on to the final steps.
- During the final steps, the sensor takes readings of a series of software-generated colors and establishes the monitor profile. At the completion of these measurements, you will be instructed to remove the sensor.
- The final step is to accept the monitor profile as its selected name such as PhotoCAL Profile. This profile will be established as the monitor's default color management setting.
- To verify that PhotoCAL Profile (or whatever other name you selected) is the monitor's default setting open display properties by right clicking on the monitor screen. Go to Display Properties >

- Settings > Advanced > Color Management and verify that PhotoCAL Profile is selected. If not, select it, select apply and OK.
- Finally, repeat monthly or whenever a change in the monitor settings or working space lighting has occurred.

One Final Requirement for Good Pictures

Have a helpful and affectionate cat. Paw prints, cat hairs and the contented purr of a cat sleeping on a warm monitor are essential ingredients to assuring peace of mind during the processing of digital images. However, make sure all residual kitty imprints are removed from the monitor before calibration.

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