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AppleVision 1710 Display: Color Window Terms (4/96)

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TOPIC ----------

Please define the terms used in the Color window of AppleVision Setup for the AppleVision 1710 and 1710 AV Displays.

DISCUSSION ----------

Following are definitions of terms found in the Color window of AppleVision Setup:

White Point

All light, including display light, has a white point, which is the measure of the color content of the light. The white point is also referred to as the color temperature measured in degrees Kelvin - a temperature scale used in scientific applications. Standard white points are available by selecting a corresponding button from the default list available in the White Point panel within the Accurate Color settings. D50 or 5000 degrees Kelvin, is a common lighting setting used in graphic arts. 6500 + 8 MPCD (mean perceptible color difference) or D65 is the white point of Midday sun. The default white point is 9300 + 8 MPCD which is the standard setting for Macintosh displays and high-definition television. This is a high-intensity white point, located at the blue end of the color spectrum. The lower the intensity, the closer it moves to the red end of the spectrum. If you are working in a darkroom environment, you should choose the lowest standard setting, which is D50. Other common settings not available by selecting a button are: D40 or 4100 degrees Kelvin for halogen light and D33 or 3300 degrees Kelvin for flourescent light. Please note that the AppleVision 1710 Display does not support color temperatures below 4100 degrees Kelvin.

If you wish to create a custom white point, click the Create Custom White Point button. When you do this, the Custom White Point dialog box appears on the screen. You create a custom white point in one of three ways. If you select Kelvin, the numeric feedback panel with slider and detente white points appears to the right of the button. You can then create a white point based on a Kelvin

temperature between 4100 and 9300 degrees by moving the slider. Lower temperatures create reddish whites and higher temperatures create bluish whites. If you select the button xy (1931 CIE), or u'v' (1976 CIE), the respective windows contain a color space graphic, a cross hair cursor that you can drag, and two fields of coordinates that you can edit. By the dragging the cross hair, you can set the desired white point value.

Gamma Curve

The gamma curve is the relationship between color intensity (chromaticity) and light (luminance) and determines the degree of gamma correction for the display. With a low gamma curve, colors are washed out. With a high gamma curve, colors have more contrast. The human eye can determine subtle changes in color, but does not register these changes in a linear way. Color systems are linear and continuous. A linear gamma curve ensures that the display produces the correct luminance levels on each primary color channel, and matches the user's nonlinear color expectations to the display's linear color devices. Gamma correction is a technique that adjusts the gamma curve to compensate for the loss of detail in dark objects. The default gamma value for the AppleVision 1710 Display is 1.8.

You can adjust the gamma curve on your AppleVision 1710 Display to ensure that the light and dark detail on images that you import or export is consistent. Most scanners have a gamma value of 1.0, while video editing equipment use a gamma value of 2.2. You can select a gamma value from the Gamma Curve panel in the Color window. When you do this, the gamma curve image in the panel changes to reflect the new value.

Ambient Light

Ambient light is the light surrounding the display. It can change the way colors appear on the screen. For example, fluorescent lights make colors look bluer, daylight or sunlight can make them look redder. To get a true color rendering, first set the white point for the display, and then correct for ambient light. Before you can correct for ambient light, you must also set the display color depth to millions. (To create a custom ambient light, use the ambient light tool supplied with the display and follow the instructions in chapter 4 of the user's guide.) The default ambient light setting is "None".

ColorSync System Profile

Macintosh computers use an additive system that combines red, green, and blue (RGB) phosphors to create display colors. They use a subtractive process of cyan, magenta, yellow, and black (CMYK) inks to create printer colors. Because these two processes are different, and because no two color devices produce exactly the same colors, AppleVision 1710 Displays, printers, scanners, and other color devices, must be characterized to provide the best color match. The software that does this is called ColorSync, and the AppleVision 1710 Display comes with a general profile called a ColorSync profile that characterizes the display. (For instructions on importing and exporting Colorsync profiles, follow the instructions in chapter 4 of the user's guide.)

When you reset the white point, gamma curve or ambient light, you will not see the change reflected on the screen or be able to export ColorSync system

profiles until you click the Recalibrate button located in the Color window.

Virtual Photometry Technology

The AppleVision display has the ability to correct for manufacturing variances through a process called Virtual Photometry Technology (VPT). Using VPT, the AppleVision display can be set to a wide variety of white points and can correct for CRT aging, and for ambient light conditions. VPT is a proprietary Apple technique used to calculate a theoretical white point. It does this by measuring the currents for the R, G, and B electron guns, while displaying a white screen. The current values are correlated to factory calibration data that is programmed into the display during production. An extremely accurate white point can be determined by compensating for the aging affects of the display. The current sensing circuitry also allows the host CPU to calculate the observed color of any pixel on the screen.

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