Color Correction for Video using Custom Presets

Application Note

Figure 1. Tektronix WFM5200

Figure 2. Tektronix WFM8200

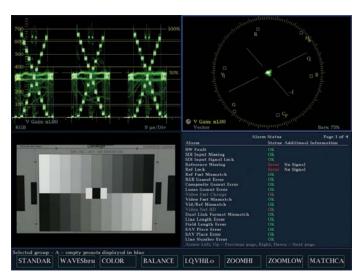Figure 3. WFM 5200 Option CAM with 4 different inputs.

Color correction is something that has to be done efficiently. There's usually a budgeted amount of time to color correct a project. And even if you have an unlimited amount of time, you still want to stay in the "flow" of the process. One of the things that can help you be efficient and "stay in the moment" is having access to the best Waveform Monitor and the best view of that display or combination of displays. Each image and each process can require that you look at a different display – like a waveform, parade waveform, vectorscope or a gamut display – and that you can quickly zoom in or look at particular parts of that display. The preset functionality of the Tektronix Waveform Monitors, including the low cost WFM5200 (Figure 1) helps you stay focused on the task of color grading instead of button pushing.

The WFM5200 and the rasterizer version of the WFM5200 show 2 trace displays at a time. The WFM5200 CAM option can show four different displays simultaneously in quadrants, but only two of them can have a "trace" like a waveform, vectorscope or gamut display (Figure 3). The other two displays can be any combination of audio information, picture or status. In this document, we will show how even the status and picture displays can be very useful in color correction. Tektronix WFM8200 and 8300 (Figure 2) can show four trace displays at once.

Figure 4. This is a good default preset configuration. It includes an RGB Parade Waveform, a vectorscope, a Picture display and an Alarm Status display.
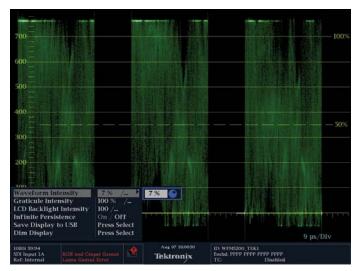

Figure 5. Note at the bottom of the screen that each preset has a customized name associated with a button. No need to scroll through menus to find a preset.

Figure 6. Tektronix's exclusive Spearhead display is a good complement to the vectorscope. Together they give you a complete, three-dimensional view of your color space.

The value of having 8 presets available at the touch of a button is to be able to quickly get to the most common views that a colorist could want of a waveform monitor. One of the most common displays for two Waveform Monitors would be an RGB Parade and a vectorscope (Figure 4). The RGB Parade is the "go-to" display for most colorists. Each of these presets can be custom named by you. You might call this one STANDARD.

Another good preset would be a vectorscope and a standard waveform display. I called this WAVESBRU because I also included a bright-up display for the picture monitor, showing you where there are illegal colors, kind of like zebra stripes on some cameras (Figure 5).

Another good preset would be a vectorscope and the complementary gamut display of a spearhead. I called this COLOR because the combination of the vectorscope and the spearhead provide a three-dimensional view of color space when used together (Figure 6).

Another reason these two displays work well together is because of a common misconception that the vectorscope displays saturation. However, the distance from the center of the vectorscope can also be affected by value or a combination of value and saturation. The spearhead shows whether the excursion of the trace on the vectorscope (how far it is from the center) is coming from saturation or value. The vectorscope is a good complement to the Spearhead because the vectorscope shows hue.

Figure 7. Presets don't have to just define specific views or tools, but can also include specific settings, like zooms, magnifications or even brightnesses, like in this example. Notice the menu indicating a waveform intensity of 7%. Compare this to Figure 8, with a waveform intensity of -31%.
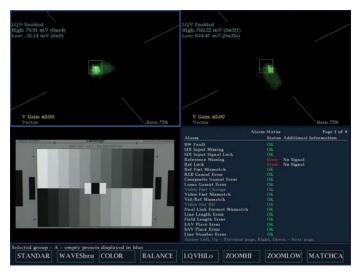

Figure 8. Note that the brightness of the trace is lower in one display than it is in the other. It is possible to control this with a menu setting at any time, but you can also program this brightness change into a preset that is accessible with the press of a button.

Figure 9. This shows a standard RGB Parade at the top left. On the top right the image is zoomed in and repositioned to show the detail of the highlights.

Figure 10. This shows a standard RGB Parade at the top left. On the top right the image is zoomed in and repositioned to show the detail of the shadows.

Tektronix has a very useful feature for matching shots that involves capturing or caching a reference image in the waveform monitor and then displaying it superimposed with whatever the live feed is coming into the waveform monitor. When you do this, however, the combined, superimposed trace displays can be very bright. To assist with using this feature quickly and efficiently, this preset, called "MatchCap" lowers the trace brightness (Figure 7). Presets don't have to just be different display combinations, but also different SETTINGS for displays, including trace brightness, zooms, magnifications and other user settings (Figure 8).

To fine tune color corrections, it is often useful to zoom in on a specific portion of the trace to see fine detail. A good example of this is to zoom in to the blacks in the RGB Parade waveform monitor to better balance black levels (Figure 10). Similarly to zoom in to the highlights to match white levels (Figure 9). To make these common tasks easier, create a preset with each of these zoomed views side by side with a standard view, to maintain perspective on the whole trace. These presets are available for download on the Tektronix website (should provide a link to the exact location here). In the downloadable bank of presets for the WFM5200, these presets are called "ZMSHADOW" and "ZMHILIT."

Figure 11. Tektronix's exclusive Luma Qualified Vectorscopes can be customized to show only a specific tonal range of interest to the colorist. For example: only the shadows or only the highlights.
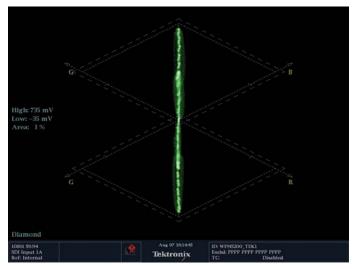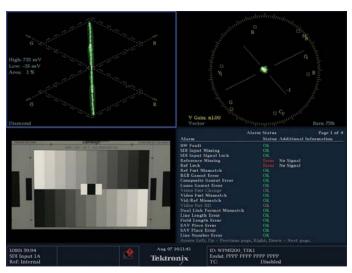

Figure 12. Note that the chip chart, which should be completely neutral, skews off towards the left of the top diamond, indicating that the highlights are greenish, and towards the right on the bottom diamond indicating that there is also some red in the highlights. Red and yellow combined equals yellow.
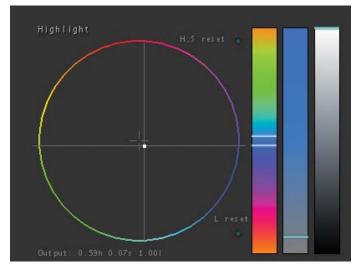

Figure 13. With the line running vertically up the middle, the image is balanced.

Figure 14. This is the highlight color wheel adjustment that balanced the chip chart. Notice that the center point on the color wheel is pulled towards blue, which is the opposite of yellow.

A relatively recent innovation from Tektronix is the patented Luma Qualified Vectorscope display, or LQV (Figure 11). Luma qualified vectorscopes allow you see only a specific tonal range of your image displayed in the vectorscope. These tonal ranges are completely customizable. In the 5200 presets available for download on this website, one of the presets is for side-by-side LQVs for highlights and shadows, called "LQVHiLo." These side by side LQVs really let you balance easily because you're not seeing all the midtones.

A large part of any colorist's job is balancing images so there is a preset called "BALANCE" with a Vectorscope matched with a Diamond display (Figure 12). You could edit this preset to be an RGB Parade Waveform with a Diamond display. The Diamond display shows neutral colors in the center of the display, with blacks where the two diamonds meet in the middle, whites at the top of the top diamond and at the bottom of the bottom diamond, and midtones a the diamonds' widest point. Green is indicated toward the left of both diamonds, blue is indicated to the right of the top diamond and red is indicated to the right of the bottom diamond.

The Diamond display in the example above (Figure 12) is actually showing you that the blacks are balanced (horizontally centered) but the highlights are a little green and a little red, which means yellow. Drag the highlight color wheel a touch towards blue (Figure 14), and presto, your highlights are balanced (Figure 13).
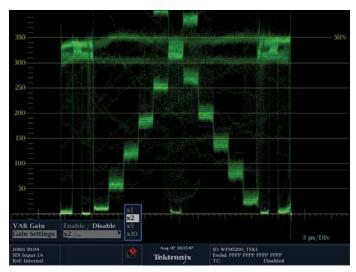
Figure 15. Specific amounts of zooms, gains or magnifications can be described and saved in a preset so you can instantly access a particular setting.
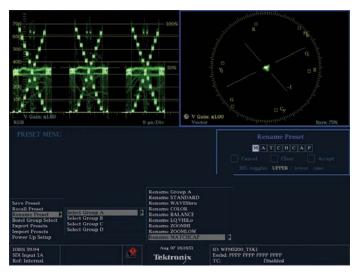

Figure 16. Note the menu information near the bottom of the screen. This shows how each preset can have a descriptive, customized name instead of just a function number.

Figure 17. The front panel of the WFM5200 provides access to many dials and buttons that make it quick and easy to access the most important functions.

With the WFM 5200 Gain, magnification, brightness, position, are all accessed at the touch of a button (Figure 17) instead of having to adjust them for every shot. This increases your efficiency dozens or hundreds of times a day. The important thing about presets is that you can customize them exactly the way you want, from the colors to the zooms (Figure 15) and gains to the names (Figure 16).

Figure 18. Presets are recalled with two button pushes. Press the reset button (under the finger in this image), then the softkey corresponding to the Preset you want to enable along the bottom of the waveform monitor.
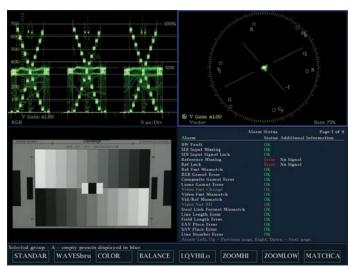

Figure 19. Note the names of the presets along the bottom of this image. These names are all easily customizable.

Presets on Tektronix waveform monitors are easily and quickly recalled. Just press the Preset button (Figure 18) and the soft button that has the name of the preset you want (Figure 19). There are actually four banks of eight presets in the WFM5200. It's easiest if all of your common presets are in just one bank. But the WFM5200 can save a total of 32 presets (Figure 16). You can easily transport these presets between devices. I've saved the presets I created and they're available for download from Tektronix.

Figure 20. You can download a bank of eight presets designed by noted color correction author, Stephen Hullfish, from www.tektronix.com/5200learn.

Figure 21. When the preset file is downloaded and un-zipped, copy it to a USB "stick" or "thumb drive." This image illustrates the preset folder on a PC desktop next to the icon for a small USB "thumb drive."

Figure 22. After properly dismounting the "thumb drive" from your computer, plug it in to the USB port on the front of the WFM5200 or other Tektronix waveform monitor.

Figure 23. Hold down the preset button, just to the left of the USB port.

Steve Hullfish, author of "The Art and Technique of Digital Color Correction" created a bank of presets for the WFM 5200 and they are available for download from the Tektronix website at www.tektronix.com/5200learn (Figure 20). It is easy to download them to your computer and transfer them via a USB thumbdrive to your WFM5200.

First, locate them on the Tek website and download them to your computer. Unstuff them – the folder should probably read WfmPrst - and load it on a USB thumb drive (Figure 21).

Then unplug it from your computer, go over to your Tektronix Waveform Monitor and pop the USB drive into the USB port on the front of the WFM5200 (Figure 22).

Hold down the Preset button for a few seconds. Use the adjustment arrows to select Import Presets (Figure 23).
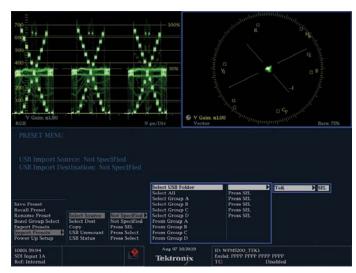
Figure 24. Follow the prompts in the on-screen menu to load the presets from the USB port.

Select a source. Select a USB folder (Figure 24). Select ALL. Select a Destination. Select ALL. Then select COPY and press the select button. You should receive a message that it was successful.

You can transfer your presets to other Tektronix Waveform Monitors or share presets with other editors who have Tektronix Waveform Monitors.

There are lots of ways to customize your presets and save them. These Tektronix presets will save you hours of time, getting you the right information quickly and easily when you need it. Feel free to customize them once you've had a chance to use them, so that they work best for your personal style and workflow.

Be sure to check out the on-line demo of the Tektronix WFM5200 and the rest of the videos on Color Correction for Video on the Tektronix website at www.tektronix.com/5200learn.

For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit **www.tektronix.com**

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