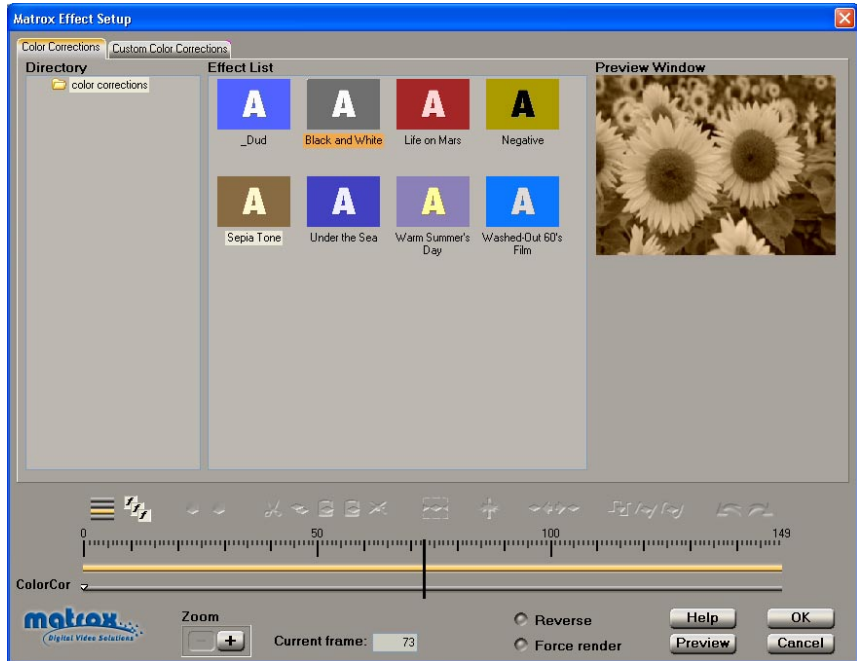


## Applying a pre-created color correction

When you apply a Matrox color correction, the **Color Corrections** page appears:



**Note** You can apply realtime Matrox color corrections to video clips only. If you apply Matrox color corrections to graphics clips, you'll need to render. You can, however, use an image-editing program (such as Adobe Photoshop) to correct the color of your graphics clips.



### To set up a color correction effect:

- 1 Click the particular effect you want from the **Effect List**.



**Tip** If you want to modify your clip without using any of the pre-created settings, select the **\_Dud** effect.

- 2 To change the settings for your selected color correction effect, see [“Creating a custom color correction”](#) on page 72.
- 3 To see a preview of your effect at any time, click the **Preview** button.
- 4 When you are satisfied with your effect, click **OK** to return to your Timeline.

## Creating a custom color correction

To customize the settings for your Matrox color correction, click the **Custom Color Corrections** tab or the **ColorCor** track:



By selecting **Simple edit**, all settings are applied for the duration of your clip. This means that you'll have only one keyframe at the first frame of your clip. If you want to change settings at different frames of the clip, you'll have to clear **Simple edit**. When **Simple edit** is selected, the only toolbar button available is **Apply Default Settings**.

You can customize your color correction using the following:

- **Proc Amps** The processing amplifier (proc amp) controls allow you to adjust different aspects of your clip:
  - **Hue** Adjusts the tint of the colors in the image.
  - **Saturation** Adjusts the saturation (vividness) of the image's colors.
  - **Contrast** Adjusts the difference in luminance between the lightest and darkest areas of the image.
  - **Brightness** Adjusts the level of black in the image.
- **Color Balance** These controls let you adjust the mixture of colors in your clip.



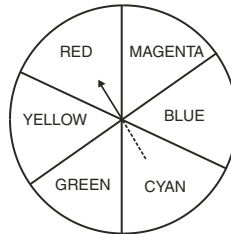
**Note** By default, any changes you make to the color balance (cyan to red, magenta to green, or yellow to blue) affect your clip globally, from the lightest white to the darkest black. To affect only shadows, midtones, or highlights, you'll need to select **Affect specific tonal range**.

- **Auto White Balance** When you click this button, an eyedropper tool appears over your image in the **Preview Window**. Click the eyedropper tool on an area of white or medium gray in your image. This automatically applies a color shift to your clip to compensate for different lighting conditions.



**Tip** You can also use a keyboard shortcut to select **Auto White Balance**. Press **A**, then use the eyedropper tool.

- **Color sliders** Drag a slider toward a color you want to increase in your clip, or away from a color you want to decrease. You can also enter a value in the text box beside each slider. Increasing a color by a certain value automatically decreases the opposite color by the same value. For example, if you move the **Cyan/Red** slider towards red, you also decrease cyan by the same amount, as shown in the following diagram:



- **Preserve luminosity** Select this to maintain the luminosity values (tonal balance) in your clip while changing colors.
- **Affect specific tonal range** Select this to make color balance changes to only one of the following tonal ranges:
  - **Shadows** Affects the darkest areas of your clip.
  - **Midtones** Affects the areas with tones between the darkest and lightest areas of your clip.
  - **Highlights** Affects the lightest areas of your clip.
- **Input Levels** These controls let you fine-tune your clip's brightness and contrast by changing the luminance value that represents black, white, or gray. Doing so expands or compresses the range of luminance levels in your clip, which increases or decreases your clip's tonal range.

For example, by moving the black triangle to the right, you set black in your clip to a higher luminance value, which compresses the luminance range and darkens your clip proportionally.

- **Luma Plot** Click this to plot the luminance values in the current frame of your clip to the histogram (the plot will reflect any color correction changes you’ve made). Each luminance value present in your image appears as a vertical line in the histogram. A longer line indicates a higher amount of pixels in your image of that line’s luminance value.
- **Black** Use the black triangle under the histogram or the slider to define black in your clip.
- **Gamma** Use this to adjust the midtones in your clip without affecting black or white.
- **White** Use the white triangle under the histogram or the slider to define white in your clip.
- **Auto Level** Click this to define the darkest and lightest pixels in your clip as black and white, respectively. The intermediate luminance values are proportionally redistributed.
- **Output Levels** These controls let you map the values under **Input Levels** to any level of black and white. Use the black and white triangles or the sliders to achieve results such as reducing contrast in your clip, or reversing the luminosity of your clip by setting black to a higher value than white.

## Using the Matrox scopes

The Matrox vectorscope/waveform monitors are software oscilloscopes that let you examine the video signal components of your clips. The Matrox scopes offer various tools for analyzing different aspects of your clips (they do not affect the video signal itself). If any adjustments are necessary based on the results, you can use the color correction controls to make these adjustments.



**Note** Because your analog video is converted to a digital signal when input to RT.X100, the Matrox vectorscope and waveform values provide an analysis of your video in digital format only. Therefore, you can’t analyze the blanking, sync, or color burst signals. Be aware that the values for the digital signal may vary slightly from those of the analog signal output from RT.X100 (converted from digital back to analog).

In the following sections we explain:

- How to select and view the various scopes.
- What each scope does.
- How to use the scopes to make different types of adjustments.

## Selecting and viewing the scopes

There are different ways you can select and view the various Matrox scopes. When you click the **Scopes** button, the **Image View** and **Scope View** tabs are available:



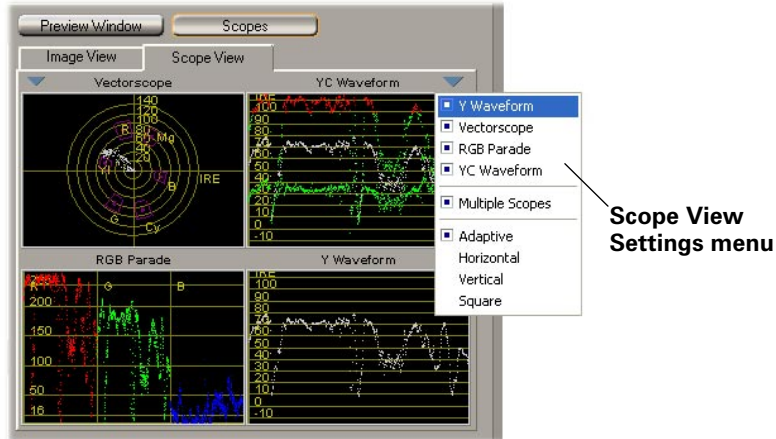
- **Image View** Lets you select the area of your clip that you want to analyze:
  - **Analyze a line** Drag the line in the **Image View** window to the line you want to analyze, or enter a line number in the text box.



**Note** You can select only the even lines in your clip.

- **Analyze a rectangle** Click and drag in the **Image View** window to select a rectangular area that you want to analyze. The text box displays the coordinates of your rectangle.
- **Analyze image** This selection allows you to analyze your complete image.

- **Scope View** Displays the Matrox scopes. You can change the settings to select which scopes you want to see, and how you want them to appear by clicking the ▼ button on the right side of the **Scope View** page:



As you move your mouse within each monitor (vectorscope or waveform), you'll see a crosshair at your chosen position, and the values at that position are shown in the top right corner of the monitor.



**Tip** Double-click or drag the **Scope View** tab to display the Matrox scopes in a separate window that you can move and resize. This also allows you to keep **Image View** open at the same time.

### Scope definitions


There are four different monitors to help you analyze your video clips:

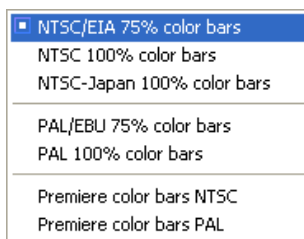
- **Vectorscope** Shows the phase and amplitude of the color components of your video signal. Standard “targets” (small boxes) on the vectorscope correspond to the six colors in a standard color bar pattern (red, green, blue, yellow, cyan, and magenta). Color bars are usually analyzed with the vectorscope. By analyzing color bars from your source video on the vectorscope, you can make adjustments as needed to calibrate your video. For details on how to calibrate your video, see [“Calibrating video using color bars”](#) on page 77.
- **Y/C Waveform** Shows a representation of the combined luminance (Y) and chrominance (C) of your video. For information on interpreting the Y/C waveform results, see [“Ensuring legal colors for broadcast”](#) on page 78.
- **Y Waveform** Shows only the luminance (Y) values of your video, with the chrominance removed (as if your clip was in black and white).

- **RGB Parade** Shows the red, green, and blue components of your video in three side-by-side columns. For information on interpreting the RGB parade results, see [“Matching colors with the Matrox scopes”](#) on page 79.

## Calibrating video using color bars

Video professionals use color bars on their tapes to ensure that video clips are calibrated for correct color and brightness. Adjustments can be made based on the results of analyzing the color bars from your source video on the vectorscope and Y waveform:

- 1 Place a clip containing color bars (captured from your tape) on the Timeline and apply the Matrox color correction effect to the clip.
- 2 Select the **\_Dud** effect from the **Effect List**.
- 3 Click the **Custom Color Corrections** tab, then click **Scopes**.
- 4 On the **Image View** page, select **Analyze a line**. Select a line in your color bar pattern that includes only the colored bars representing red, green, blue, magenta, cyan, and yellow.
- 5 Double-click the **Scope View** tab to display the Matrox scopes in a separate window. From the **Scope View Settings** menu, choose **Vectorscope**.
- 6 Choose the appropriate color bar pattern from the **Vectorscope Settings** menu (click the  button on the left side of the vectorscope):



**Important** Make sure you choose the type of color bars that matches the color bars you're analyzing from your source video.

- 7 Check if the dots representing the colors in your color bar pattern appear within their respective targets on the vectorscope display. These targets are where the dots should appear if the color is correctly calibrated (that is, the saturation and phase relationships are correct). If needed, you can adjust the proc amp controls to get the dots as close as possible to the target boxes. Use the **Hue** control to rotate the dots around the circular graph, and use the

**Saturation** control to move the dots closer to or farther from the center of the graph.



**Dot aligned in blue target**

- 8 You can also check the white levels in your color bar pattern. From the **Scope Settings** menu, choose **Y Waveform**. The gray or white color bar corresponds to a line on the waveform (usually the first line at the left). The IRE or mV level of this line should match the type of color bars you are using. If needed, use the **Brightness** and **Contrast** proc amp controls so that the proper IRE or mV level is set. For example, when using **NTSC/EIA 75% color bars**, adjust the **Brightness** control so that the level of IRE for the gray portion of your color bars is set to 75.

**Tip** You can save these modifications as a custom effect so that you can quickly calibrate all your clips from the same source tape. For details on how to save your effect for future use, see [“Common controls on the Custom pages”](#) on page 51.

### Ensuring legal colors for broadcast

Many television studios require that a video clip’s luminance (Y) and chrominance (C) values don’t exceed 100 IRE on an NTSC system, or 700 mV on a PAL system. These are the highest “legal” levels for broadcast video. To ensure that your clip’s levels are legal for broadcast:

- 1 Place your clip on the Timeline and apply the Matrox color correction effect to the clip.
- 2 Select an effect from the **Effect List**.
- 3 Click the **Custom Color Corrections** tab, then click **Scopes**. On the **Image View** page, select **Analyze image**.
- 4 Double-click the **Scope View** tab to display the Matrox scopes in a separate window.
- 5 From the **Scope View Settings** menu, choose **Y/C Waveform**.
- 6 Scrub through your clip, and make sure that there are no red dots in the waveform monitor (levels exceeding 100 IRE or 700 mV show as red).
- 7 If needed, lower the **Brightness** and/or **Saturation** proc amp controls, until there are no red dots in the waveform monitor.



## Matching colors with the Matrox scopes

To match color between two clips (such as skin tone, sky, etc.):

- 1 Place the clip that has the correct colors on the Timeline, and apply the Matrox color correction effect to the clip.
- 2 Select an effect from the **Effect List**.
- 3 On the **Image View** page, select **Analyze a rectangle**, then click and drag in the **Image View** window to select the area containing the colors you want to match.
- 4 Double-click the **Scope View** tab to display the Matrox scopes in a separate window.
- 5 From the **Scope View Settings** menu, choose **RGB Parade**.
- 6 Place the crosshair in the **RGB Parade** over the section containing the colored dots under each of the R, G, and B columns, and take note of the corresponding R, G, and B values displayed in the top right corner.
- 7 Set up a Matrox color correction on the other clip whose colors you want to match to the first clip.
- 8 Click and drag in the **Image View** window to select the area containing the colors you want to match to the first clip.
- 9 Double-click the **Scope View** tab, then use the **Color Balance** controls to adjust the colors to match the R, G, and B values you noted for your other clip. For example, place the crosshair over the red pixels under the R column, and adjust the **Cyan/Red Color Balance** slider until the R value matches the R value in your other clip.