

## Color Matching

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(formerly known as *CyberMotion*)

### Carefully tinting footage to help match disparate clips.

During a normal job, footage may come from a variety of sources: freshly-shot clips, archival elements, greenscreen, 3D renders, and (of course) stock footage. The trick is making all of them seem to have been shot under the same lighting conditions with the same equipment. Otherwise, there will be a subtle disconnect as you move from one shot to another, or try to composite keyed footage or a 3D render into a new scene. These disconnects can gnaw at the back of a viewer's mind when instead they should be paying attention to your storyline.

There are several ways to solve this problem. The easiest is to apply the same photo filter or film stock treatment effect to all of the clips, giving them all the same color bias. A more nuanced approach is to look

at the color biases present in a guide clip (such as the background footage in a composite), and color correct the other clips (such as the new foreground elements) so that they share the same biases. We'll walk through a couple of examples here using the Color Balance effect in After Effects; any other effect in any other program that allows you to tweak the colors individually in the shadows, midtones, and highlights (such as Color Finesse, which we covered a few articles ago) will also work.

#### Example #1: From the Studio to the Beach

Figure 1 shows a typical problem composite: The foreground element (the woman originally shot on bluescreen) has a strong reddish cast, while the background has cool blue and green tones.

The first step is determining what the color biases are in the guide clip (in this case, the background) and the clip to be corrected (in this case, the woman). You need to take both into account to achieve your goal. You can "eyeball" this (in this example, it seems the woman needs less red and more blue), but there's nothing like having hard numbers to either back you up or start you down the right path.

The easiest target is if you can identify an element in each shot that should be 50% gray. Eyedropper the



Figure 1

Figure 1: The keyed woman from our previous article (courtesy of Photron), composited on top of clip TH107 from the Artbeats Tropical Hawaii collection.

color of that area (in After Effects, make sure Window > Info is open, and hover your cursor over the image), and note if the red, green, or blue channels are weaker or stronger than the others. However, images rarely have a perfect 50% gray area to study. Easier to find – and ultimately more flexible – is to identify and eyedropper areas which are near pure black (such as deep shadows), and areas which are near pure white. Note that you don't want fully-clipped black or white, as these won't reveal any color biases.

In people, the eyes are a great source place to start: zoom in and study the whites of the eyes and the "black hole" that is the pupil. (It may be tempting to also look at an open mouth, as teeth should provide nice big patches of "white" in contrast to the deep shadows inside the mouth, but not everyone has Hollywood-white teeth...) Always measure more than one pixel, and if you can, identify more than one black and one white area to look at – then average the results. In our foreground element here, both the black and white points measured as having a strong red bias, with the green and blue channels being pretty even.

*Figure 2: Eyes are a good place to find black and white points. Zoom in if needed (color eyedroppers often average together adjacent pixels; zooming gives you larger blocks of color to sample). In this case where the eyes are in shadow (being closer to a middle gray), we studied the brightest pixels available and averaged them together.*



Figure 2

In our background clip, the clouds provide both good white and middle-gray values to study, while the rocks in shadows provide a good black reference. Interestingly, the blue channel is slightly weak in both the whites and blacks (you may have guessed it was strong, given the blue sky and water), while the middle grays have the expected blue tint and a slight lack of red.

The next step is resolving these differences. We started by applying the Color Balance effect to the foreground, and reducing the Shadow Red Balance value to remove the red cast from its shadows. After doing so, we re-checked the resulting RGB values in the adjusted foreground's shadows. This revealed that the green channel was weaker than we originally thought, so we boosted the Shadow Green Balance while very slightly reducing the Shadow Blue Balance to match the slight lack of blues in the background's shadows.

Next we moved onto the highlights, reducing the foreground's Highlight Red Balance value to neutralize the cast there as well. Finally, we increased the Midtone Blue Balance to induce the same blue mid cast that was present in the background. The result is a much more harmonious blend between foreground and background. When you do this yourself, spend some extra time checking your results, as the Shadow, Midtone, and Highlight ranges do strongly overlap – which means that adjusting one will have an effect on the others.



Figure 3

Figure 3: Our corrected shot. The red bias has been removed from the foreground element while its blue midtones have been increased slightly, helping it blend in better with the beach and sky behind her.

## Example #2: Into the Jungle

Just to show this technique isn't a one-trick pony, let's quickly work through a second example. In Figure 4, we studied the clip of the new actress, and discovered that she had very even red, green, and blue channel information when we look at her eyes and gray shirt.

However, the background is a different story: The bright mist in the background has even RGB values, but the gray tree trunks which are partially obscured by the mist have weak blue channel information, as well as slightly elevated reds. Blue is lacking in the shadows as well, but here it's the green channel that is elevated. We want to impress these same biases onto the new foreground shot.

Since the background is lacking blue in the midtones and shadows, we started by reducing the Midtone Blue Balance of the foreground elements – midtones strongly overlap the shadows as well, so we got a two-for-one adjustment here. Reducing blue makes a shot appear more yellow, better matching the tones in the foliage. Midtones also overlap the highlights, so we slightly



Figure 4

Figure 4: The foreground shot (courtesy of Hollywood Camera Work) – which is actually well-balanced on its own – looks slightly blue and pink compared to the greens in the background (clip TH120 from the Artbeats Tropical Hawaii collection).

## Tips & Tricks

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increased the Highlight Blue Balance value to compensate there.

We increased the Shadow Green Balance value for the foreground to harmonize it with the shadows in the trees. Finally, we slightly increased the Midtone Red Balance for the foreground to match the bias present in the background. We then went back and eyedropped several ranges in the foreground again and tweaked our values until both our brains and our eyes were happy with the result in figure 5.



Figure 5

As with the previous article on Light Wrap, there is indeed a plug-in which does a lot of this work for you: Color Matcher from the Key Correct Pro collection (distributed by Red Giant Software). You can select a background clip for it to attempt to automatically match, and then in the same plug-in further tweak the same color offsets that are available in Color Balance. In the case of both light wrap and this color matching technique, the effect is not all that noticeable; indeed, the goal is to make your work less noticeable by achieving a better match between elements. It may not be as much fun (or visually arresting) as blowing something up, but it serves your client in the end.

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*Figure 5: Removing blue makes the actress appear more yellow, making her a better match for the new background plate.*

### Zooming Out

After you've adjusted the colors in your images, you might also consider adjusting their grayscale values. Apply a Levels-style effect to your guide clip (again, Color Finesse will work as well), and study the distribution of blacks, middle grays, and whites. Then apply Levels to your other clips and study their histograms to see if the distribution is radically different. You might need to move the Input Black or White points to strengthen the shadows or highlights, or bend the Gamma to get a better distribution of brights versus darks across the scene.