

Creative Chromakeying

With RICHARD HARRINGTON



Richard Harrington

A certified instructor for Adobe, Apple, and Avid, Rich is a practiced expert in motion graphic design and digital video. His visual communications consultancy, RHED Pixel, creates motion graphics and produces video and multimedia projects. He is the author of *Photoshop for Video*, *Producing Video Podcasts*, and *Understanding Adobe Photoshop* as well as a moderator at Creative Cow. A Masters Degree in Project Management fills out Rich's broad spectrum of experience. You can find out more about Richard and his training resources at www.RasterVector.com and www.PhotoshopforVideo.com.

Creative Chromakeying

The use of green-screen and blue-screen is a popular technique for both video and film special effects. In this informative session you'll learn how to create virtual environments from photos, then key your video using Photoshop or After Effects. The chroma key wall has come to be used for much more than just the weather. With improvements in both keying technology and cameras, it is possible to get professional results on tighter budgets. How you key will vary on the footage you use. A special emphasis will be placed upon using After Effects' powerful keying technology like Keylight as well as strategies to help with the production of the chroma key shoot.



Shoot It Right

Often cameras, especially prosumer rigs, will have auto features turned on that can make keying much more difficult.



1. Turn off all the Autos: Turn off Auto exposure, auto-white balance and auto-focus. If any of these are left on, this means the green you're trying to key will constantly be changing as your model moves. Even if you've hired a professional videographer, don't make assumptions. Double-check that he or she has turned these things off or you will spend hours trying to fix it.

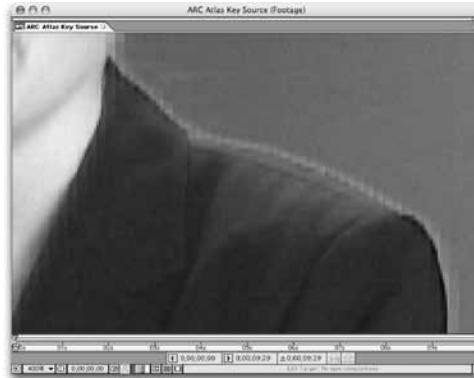
2. Turn off sharpening: While you're in the setup menu, be sure to turn off Sharpening. Most consumer cameras have a sharpening filter that is turned on by default. This causes your edges to increase in contrast and destroys subtle edge detail. Turn this off.



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3. If shooting DV, definitely go green: The DV compression noise is present more in the blue channel, making your edges harder to get clean, than with a blue-screen. In DV, the green channel also has nearly twice as much information as the blue channel, as it is carried in the luminance stream.



4. Shoot chroma key with shallow depth of field: If you can change your aperture settings, an aperture of 2.0f is much better than 22f.

This has to do with depth of field. You want the background as blurry as you can get it so that wrinkles, seams and hot spots blend away.

5. Keep your model and your camera as far away from the screen as possible: Even if it means non-green edges are showing in the shot. You can crop these out later.

6. Turn down exposure to reveal hotspots: We've heard lots of odd ways to reveal your hotspots when setting up your screen lighting. We've found the best way is to simply set the exposure of your camera down and look through the monitor. Your hotspots will be glaring at you.

7. Light with two softboxes, or two fluorescent lights: These are lights for the screen only. These lights are separate from the lights you use for your model. You can fix a lot with even lighting by two identical soft boxes or even two or three long fluorescent light fixtures. Soft boxes are incredible, yet expensive. Shop-light fluorescent lighting fixtures are incredibly cheap; available at any hardware store, burn cool, and work great. Their only draw back is that they can sometimes cause a subtle hum in your audio.

8. Avoid fast movement: Quality keyers have gotten a lot better about handling motion blur. But if you can avoid it, do so. This is typically where the 'give-away' happens. This is where a good key can fall apart, especially in DV footage.

9. Go Progressive: Fields definitely get in the way of a good key. If your camera shoots progressive, take advantage of it.

10. Avoid HDV: When HDV burst onto the scene it appeared that HD was finally going to be accessible to more modest budgets. HDV brings about a lot of postproduction issues, including keying. HDV uses 4:2:0 chroma sub-sampling (just like DVDs). What this means is that tasks like chroma keying and color correction are made much more difficult because of the lack of color information in the video. (Most professional formats are 4:2:2).



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11. Spill is Bad: Make sure that the screen is evenly lit, and that the foreground person or object is far enough away from it (with its own lighting) so that there is minimal color and shadow spilling (and reflecting) between foreground and background.

12. Magenta Reduces 'Separation Anxiety': If you're going to be keying on green, consider adding a Magenta 'rim' light. This is especially useful if you don't have a lot of distance between your model and your screen. Add a rim light behind her. It can either be hidden directly behind her on a light stand or chair, or placed above and behind her. A default white light will suffice, but even better is one with a magenta gel over it. Why? Because the magenta is the exact opposite of the green you're trying to key.

13. Garbage Mattes work: You don't need to key everything... you can use the Pen tool or a garbage matte to drop out large portions of the screen. You really only need to key in the most active areas, the rest can be masked. This means the green screen needn't fill the entire frame when shooting.



14. Blue... No Green... No Blue: Are you trying to decide whether to use a blue or green or red or whatever screen? Go with a color that is the opposite of the foreground color. Blue or green backgrounds are often used because there is very little of those colors in human skin. If you were shooting a product that has a lot of blue and green in it though, you might be better off using a red screen.

15. Match it Up: When lighting the foreground (the object or person that will not be keyed out), try to match the lighting of the replacement background in the final composite. For example, if you're shooting an actor against a blue screen, and you intend to delete the blue and place the actor over a Mars landscape, make sure that the light is shining from the same direction (and with the same color and intensity) as the light shining on the Mars background.

Post Production Tips

There are lots of things that can be done to improve the overall key when working with After Effects. Here are a few things you can do to improve the keying experience.

Chroma Smoothing DV footage

By its nature, the DV format is heavily compressed. This compression introduces color artifacts, which can ruin the color in that carefully lit greenscreen. It can also cause major problems around the edges of your talent.



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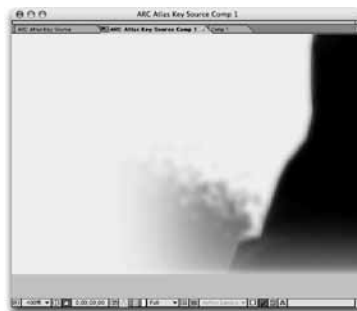
Solution #1: Don't shoot DV. Go for beta or even DVCPRO50 if at all possible to avoid DV artifacting.

Solution #2: If you must use DV, you'll need to do some chroma smoothing.

1. Add an adjustment layer above your blue/greenscreen footage.
2. Add a slight Gaussian Blur to the adjustment layer (two to four pixels).
3. Change the adjustment layer's blending mode to Color.
4. Pre-compose the footage and adjustment layers.
5. Proceed with your key.

Background Check

When keying, it's sometimes hard to judge the quality of a key when its composited over a backdrop. Detail in the background might hide flaws in the key. You can view the key more accurately by temporarily replacing the background layer with a garishly colored solid. Make the solid color the opposite color from the original screen color. For example, if the original image was shot against a green screen, try laying it over a red solid. Be sure to check the key by moving the current time indicator to check the key at a few points in time.



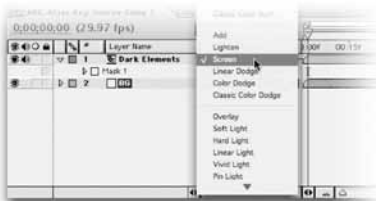
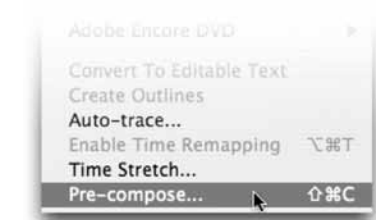
The More Mattes the Merrier

Sometimes one keying effect isn't enough. For instance, you might need one effect to deal with solid foreground objects and another effect for edge details. If this is the case, use your keying effects to generate grayscale mattes, not color images with missing backgrounds.

1. Use multiple copies of the footage and generate the mattes (this can often be accomplished within the effect by changing what you view).
2. Then combine all the mattes into a single matte, via a pre-compose.
3. Combine separate mattes using layer-blending modes. Try the screen and multiply modes, which will combine blacks and whites respectively.
4. Use the pre-comp and a track matte for the original color image.

Luminance 'Keying'

If you're trying to knock out a black or white background, there may be a better solution than keying: layer blend modes. If the background is black, try using the Screen mode. This will allow anything lighter from an underlying layer to show through the black. If the background is white, try the multiply mode, which will allow anything darker on an underlying layer to show through the white.



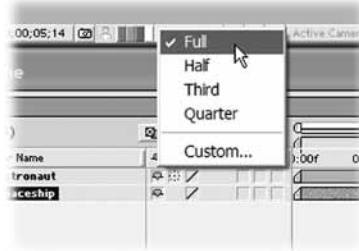
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Getting the Best Key

When using any keyer, you really need to switch your layers to Best Quality. It's also not a bad idea to view the comp window at Full resolution. Keying involved the finest detail of pixel manipulation. While it will slow you down a bit, you'll get much better results and color samples when working with higher quality view settings.



Using Keylight

What is Keylight? Keylight is The Foundry's powerful chroma keying plug-in that comes free with the Production Bundle versions of After Effects 6. It won the Academy Award for Technical Excellence, and it's a one-stop-shop for keying, despill and color correction.

When you apply Keylight to a layer and choose a color to key out, two things happen: Keylight erases all the pixels that match the key color and it also removes traces of that color (spill) from the other pixels. So if you key out green, all green (or near-green) pixels will turn invisible, and the rest of the pixels will have their greenness reduced.



Pick Your Color Wisely

The first thing you should do after applying Keylight is to choose the Screen Color (the color that will be removed and despilled). To do so, click the eyedropper by Screen Color, and then click a background color in the image.

Note that you can't add to the Screen Color by repeatedly clicking in different parts of the image, so just click once on a pixel that is representative of the general color in the background. If too much background is still visible (or too much is gone), adjust the Screen Strength parameter.

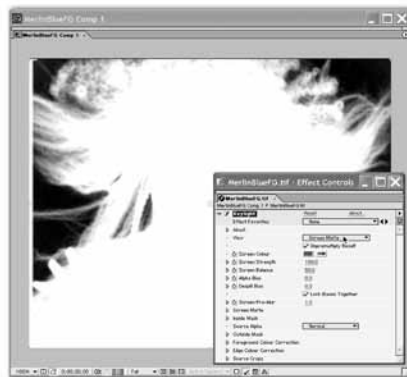


The Next Steps

With nearly 60 parameters, you could easily confuse Keylight with the cockpit of a 747. Not to worry, there are only a few main controls you'll need to adjust. The rest are for fine-tuning.

After selecting the color to key out (Screen Color), adjust Screen Strength until all of the background is gone and foreground is completely visible.

To see the matte Keylight is creating, choose Screen Matte from the View parameter dropdown (when you're finished looking at the Matte, remember to set the View parameter back to Final Result).



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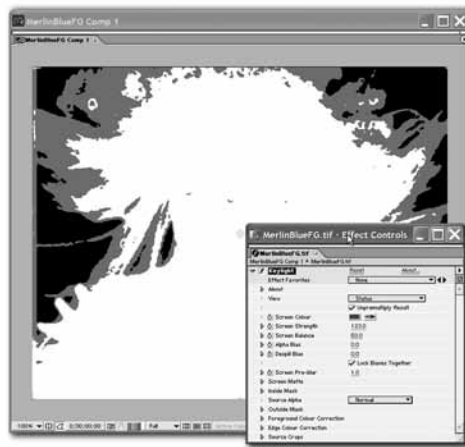
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If there's too much spill (too much of the background color in the foreground), increase Despill Bias until you've fixed the problem. You may notice that as you remove more spill, the foreground image starts to become transparent. This is because Despill Bias, which controls spill removal, and Alpha Bias, which controls the transparency of the foreground, are locked together by default. If you uncheck Lock Biases Together, you can despill without knocking out the foreground.

Seeing in Black and White

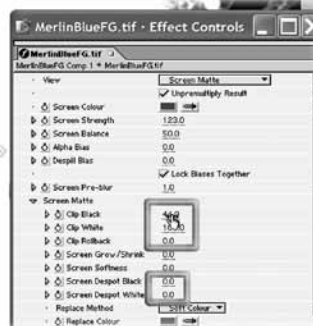
If you switch the View to Status, all pixels will display as black, white or gray. Black pixels are completely transparent. White pixels are completely opaque. Gray pixels are see-through (partially transparent/partially opaque). This view allows you to easily see problems in the matte. In general, it's good to have some gray pixels around the edge of the foreground (so that hairs and other semi-transparent elements can blend into the background), but the background should be solid black and the foreground should be solid white.



Holey Matte!

If you twirl open the triangle by Screen Matte, you'll find a slew of controls that will help you fix matte problems. While making adjustments, you may want to toggle back and forth between Screen Matte view and Final Result view.

- Clip Black makes the blacks blacker;
- Clip White makes the whites whiter. Sometimes when you adjust these controls, you'll find that you'll ruin the edges of your foreground.
- Use Clip Rollback (a sort of rewind function) to undo a little of the clipping and bring the edges back.
- Screen Despot White removes tiny white specks that are inside the generally black background.
- Screen Despot Black removes tiny black specks that are inside the generally white foreground.



Your end goal, as you view the Screen Matte, should be to have an all black background and an all white foreground, with a little bit of gray around its edges. Wispy elements, like smoke, should be gray.

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Color Corrected

After you've knocked out the background, you'll usually need to adjust the foreground's colors so that they match the colors of the new background plate. Keylight has two groups of color-adjustment parameters: Foreground Color Correction and Edge Color Correction.

- "Foreground" means the majority of the person or object left behind after Keylight has removed the background.
- "Edge" refers a thin band of pixels running around the person or object. These edge pixels often require special treatment because (a) they will usually contain the majority of spill from the knocked out background, and (b) they are the pixels that will be touching the composited pixels in the new background, so they're very important when you're trying to create a believable blend between foreground and background images.
- To adjust how thick a band Keylight thinks of as the edge, adjust the Edge Grow parameter while displaying the Color Correction Edges view.
- The Edge Hardness and Edge Softness parameters are not opposites. Edge Hardness controls how much the edge color correction merges into main foreground color correction, whereas Edge Softness blurs the edges.



Ring Color

In addition to adjusting Saturation, Contrast and Brightness, you can also adjust Hues for both the Edge and the Foreground. You can either adjust hues numerically, by scrubbing the Hue slider (under Color Balancing), or you can twirl open Color Balance Wheel and click anywhere on the wheel to pick a new color. The foreground (or edge) will become tinted with the color you pick.



If you adjust the slider (rather than the color wheel), nothing will happen at first, because the Sat value is set to zero by default, meaning totally desaturated (no color). You'll have to raise the Sat value before you can add a hue tint.

Don't Scrub So Hard!

When you adjust properties in keying plug-ins, you need an easy hand. Slight over-adjustments can destroy edge detail or tint the image an unrealistic color. But if you hold down the Command key (PC: Ctrl key) while you scrub any property value, you'll be able to adjust that property in tiny, subtle increments. This trick works for any property value (in the Timeline or in Effect Controls), not just those on keying effects.



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Click Close... Mask Far

When keying... remember, you don't usually need to key the entire screen out. Instead, you only need to get the areas closest to your subjects. Always click as close to the hair as you can when trying to set your key color. Likewise, if your edges are falling off, you can always use a garbage matte or mask to get the further edges.



Creating a Panoramic Background

By using layers, you can take several photos (from one location) and merge them together to create a large panoramic photo. Many people will take an assortment of photos of a subject with the camera handheld. Pros know its better to use a tripod and slightly move the camera to create overlap. There's even specialized tripod heads that can be bought from companies like Kaidan (www.kaidan.com) which make the leveling and rotation much more precise.



Let's try piecing some photos together. If you are using Photoshop CS or later, use the Photomerge option. If not place all three images into a larger document and manually line them up.

1. Choose File > Automate > Photomerge. Photomerge is a specialized 'mini-application' inside of Photoshop that assists in combining multiple images into a single photo.
2. Click the Browse button and navigate to the files.

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3. Choose the background images.
4. Check the box next to Attempt to Automatically Arrange Source Images.



5. Click OK and be patient... each image has to open.



6. Choose Layer > Flatten Image.
7. Crop the image to a clean rectangular shape using the Crop tool (C) [Figure 32].

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Contact Info: RHED Pixel for production services, Creative Cow for technical questions.

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