



chromakey photography

The technique of using a blue or green screen to create a special effect has been around a good long time in the film and video world. The use of chromakey in professional and studio photography is comparatively new. As a consequence, the majority of literature you will find on chromakey setup and execution is geared towards film/video work.

Many of the techniques and problems in video chromakey are shared by photography chromakey. However, using chromakey in photography has its own set of issues and in some cases they are different from film/video.

about this article

This article will attempt to help photographers using and/or exploring chromakey. It is not meant to be the definitive, this-is-HOW-you-do chromakey bible. The correct way to do chromakey will vary depending on factors such as your location, style, equipment, and setup.

Our goal is to help you identify things that will help to improve your images. Some of our suggestions will work for you; others won't. Sprinkle to taste.

Usually I will refer to Primatte Chromakey, which is our Photoshop plugin for doing chromakey work. However these tips will work with virtually any chromakey software. If you follow all of our tips and are still getting poor results, then you should take a look at Primatte. ;-)

definition of chromakey

First, a definition. 'Chromakey' refers to the technique of dropping out a solid color background and replacing it with a different source. This is often referred to as 'bluescreening' or 'greenscreening' because blue and green are most commonly used as a background color (an explanation of why is later in this article). The terms chromakey and blue/greenscreening are interchangeable.

The most common example of chromakeying is the TV weather program. A TV weather man is shot in front of a blue/green screen. A computer then removes the solid blue background and replaces it with a weather map. Or a video of flying monkeys if that supports the weather man's antics.



Two modeling sessions in front of professional blue screen setups.



The important point is that once the solid color background (in this case, blue) is removed, you can insert any imagery you want in its place. This is often referred to as 'pulling a key'. A 'key' is the blank area – technically called an 'alpha channel' – that is created when the solid color background is removed.

key points of this article

There are some key points that you will get out of this article, assuming you read the whole thing. Just in case you don't, here's a summary:

- For people, you should use a green or blue background. There is no specific shade that's necessary.
- The background must be as evenly lit as possible. This means one flat, continuous tone across the background.
- Use the least amount of light possible to do this. Otherwise you will turn the greenscreen into a big, green light.
- The background light should be one stop below the foreground light.
- The material of the background matters more than its specific color.
- We recommend a foam fabric because it is light absorbant, but any felt-like fabric will do nicely.
- Avoid paper as a background. It's usually shiny, which causes light to bounce, which causes color to spill onto your subject.
- Light the background and foreground with separate lights for best results.
- Use the least amount of light possible to get a flat background.
- Use a Magenta back light if there's too much green spill.
- Use a floor light to eliminate shadows around the feet or base of your subject.
- Position your subject 8–10 feet away from the background. You can get away with 4–6 feet, but more is better.

IMPORTANT: Keep in mind that your situation and equipment will benefit from some of these tips, and some won't work for you at all. As with most areas of photography, chromakey requires some experimentation to figure out what works best for you. **ALWAYS** do some tests before you take your chromakey work out into the field!



green? blue? If I don't like either color, what to do?

There was a time when you had to use blue as the background screen. Chromakey software was hard coded for a particular color and if you were going to be successful, you needed to use blue, and a bright medium shade at that.

This is no longer the case with most chromakey software. Our Primatte plugin, in particular, is very forgiving. You can pretty much use any solid color you want as the back screen.

The EXCEPTION is when you're photographing people. For this subject, you must use green or blue. Why? This leads us to the absolute key, you're-dead-in-the-water-otherwise principle of chromakey: ***The color you're using for the background cannot show up in the foreground subject.***

Let's look at the colors that you will find in a human subject: Red and yellow don't work because they're present in skin tones. White, black and gray don't work because they're in highlights and shadows.

So that leaves us with blue and green. Personally I prefer green because it's a lot less common in clothing. You can't separate someone wearing blue jeans and blue shirt from a blue background. (Well, this isn't absolutely true, but it requires significantly more work.) But if blue works for your situation don't hesitate to use it.

In fact, you'll generally want to have both a blue and a green screen to help cover your bases. If someone shows up in a green shirt and blue jeans, well... take a couple aspirin and call the fashion police.

flat lights, flat world

Of the many issues revolving around chromakey, the essential one is making sure the background is one consistent, solid color.

The more variation in color shades that appear in the background, the harder it is for the software to perform as designed. Most software can handle some variation but the results will suffer. That means your photograph will require more work to get a high quality key.

So what goes into making a background a consistent, solid color? Following is a good checklist of things to pay attention to.

1- no wrinkles in your screen

The background screen shouldn't have any significant wrinkles. A few small wrinkles here or there won't affect things too much. Massive square crevasses from where you folded the canvas absolutely will cause problems.

If you have to break down your screen between sessions, rolling instead of folding it will help a great deal. So will selecting a material that is not prone to wrinkles (more on this later). Don't scrunch your background up and shove it a box for 3 months until the next time you need it. It will not show you the love when you take it out.

2- choose your material carefully

The material that the background is made of has a huge impact on your ability to create an even color. You want a material that isn't prone to wrinkling or tears. You want it to have a matte finish (or as close as possible) so that it doesn't reflect light and doesn't cause bright hot spots, which are deadly to the software.

We recommend a foam material called 'Chroma Key Screen fabric'. It's manufactured by Velcro and available online at several places like Chroma-key.com and Filmtools.com. The material is inexpensive, performs beautifully, and is easy to hang.

We have tested many types of materials, including paper, paint, and fabrics, and the Velcro material is really exceptional. However, any felt-like material generally works well because it absorbs light and makes lighting much easier. Some other material tips:

- Avoid fabrics that are shiny, as they're more likely to reflect colored light back into your scene.
- Paper is the worst material we've tested. I highly recommend avoiding it. Paper is very reflective and prone to producing hot spots.
- Paint can work very well, particularly if you want to build a large chromakey area. Get a paint that has a matte finish. You might want to apply a couple coats of clear, matte spray-on. An excellent source for paint designed for chromakey is Rosco.com. But I've also used paint from Home Depot.





3- eliminate shadows

Eliminate any shadows cast by your subject. More often than not, ones that are produced during the photography session won't look natural against the new background you're going to insert. Shadows are easy to recreate in Photoshop (see our 'Shadowing Photoshop' sidebar) so you are usually better off digitally generating one yourself.

If you want to keep the studio-created shadows, that's great, and Primatte can do so easily. But if you don't want cast shadows – and a shadow over that beautiful Hawaiian sunset isn't going to sell many prints – make sure you don't have them in the first place. They're difficult to remove later if you don't want them.

How do you ward off shadows? It's simple: your lighting setup.

4- light evenly

Unless you're standing in a pitch black room, your chromakey screen will be lit. The trick to lighting the background is to get a flat, consistent color with the LEAST amount of light possible. The more light you put on the screen, the more color spill you will have on your foreground subject (a separate problem which is discussed later).

In some cases, the ambient light in the room will be enough to give your back screen consistent lighting. This will probably not be that often, but it's worth taking a few test shots when you get on location (or in your studio) to see if the ambient light alone will work.

Regardless, I recommend using separate lights to illuminate the background. Since lighting is a kinda-sorta important, let's give it a separate section to itself...

Shadowing Photoshop

Create a cast shadow for your Primatte-treated image.

- 1- Your file should have two layers: the subject and the background. Duplicate the subject layer.
- 2- Make the duplicate layer black by opening Image>Adjustments>Hue & Saturation. Set Lightness to -100.
- 3- Move the black duplicate layer behind the original layer. Keep this layer selected.
- 4- Choose Edit>Free Transform. Scale, rotate, distort and move the image in the shape/position of a shadow.
- 5- Choose Filter>Blur>Gaussian Blur. Set Radius between 10-20 pixels.
- 6- Set the Opacity of the shadow layer between 40-50%.



Want more info? We have a full tutorial here: <http://www.anarchyunderground.net/tutes/cast-shadow.pdf>



bright lights and the big spill

Lighting the screen gives you a lot more control over your results and helps solve many problems. However, it can introduce some problems too. The wrong lighting setup essentially turns your back screen – we'll use green as our example – into a big green light, casting green light throughout your scene.

This light cast is known as 'color spill' and you want to avoid it whenever possible. Primatte has built in tools to help you get rid of any spill problems, but it's better if the problems aren't there in the first place.

In general, you'll want the background light to be one stop below the foreground light.

light your background

The benefits to lighting your screen separately outweigh the negatives, so I think it is worth doing. This technique can remove small wrinkles in the screen; it will help to prevent shadows; and it will give you control over how consistent the color is across the entire screen. Separate lighting isn't necessary but it really does help in most situations.

However, I will point out that there are lots of folks who use two big umbrellas to light everything and their setup works out fine. If you're trying to get nice, even, flat lighting on your background with the same lights you're using for your foreground... your foreground subject will have nice, even, flat lighting, too.

This doesn't make for the best portraits, but for something like event photography may work out just fine. Then there's always those few people that aren't going to look good no matter how you light them... but I digress.

I prefer continuous lights because they allow me to vary the intensity of the lights. This may be because I come from a video background, but I find continuous lights give me more control. It also allows you to more easily see what the end result will look like.

You'll want two lights on the background; one on either side, or one on top and one on bottom. I prefer them to the side, but that will vary depending on your situation. Once you have the lights set up, use the intensity control to dim them down to the lowest level that gives the screen a flat color.



light your foreground

You can now light the foreground as if the background wasn't there. Normal portrait lighting techniques work fine.

If you're having trouble with spill from the green screen, try adding a Magenta backlight or sidelight. Magenta is the opposite of Green and will go a long way to neutralizing the green spill. If you're using a blue screen, then add an Orange light.

If you are doing full length shots, you may also want to have one or two floor lights to get rid of shadows around the subject's feet. We already talked about the benefits of eliminating shadows during the photography session and adding them in digitally afterwards.

Of course, at this point you're using enough electricity to light a small village. So keep that in mind and make sure you've got good circuit breakers.

Lights with different temperatures are ok. You can use different temperature lights on the background than you're using on the foreground. The background might shift a little in color, but since Primatte doesn't need it to be a specific shade of green or blue, that's not a big deal.

A common cause of color spill is the green light reflecting off a white ceiling or wall and back on to the subject. This reflection becomes very problematic because it causes the entire image to take on a green cast, which is difficult to get rid of. If you paint the ceilings and walls black or neutral gray, or hang dark canvas, you'll help to prevent this problem.

positioning your subject

One of the best ways to avoid any spill is to simply move your subject further away from the back screen.

You want to get the subject past the point where the light falls off. If the screen is properly lit, the falloff point should be at the 5–8 ft. mark. Putting the subject beyond this range will dramatically help in reducing spill.

IMPORTANT: The less light you have on the screen, the closer you can put your subject.

Never put the subject up against the screen. This creates hard, dark shadows and increases the amount of color spill to dangerous levels. Primatte, or any other chromakey software, will have a very hard time with these images.



doing full length shots

Three-Quarter and Head-Shoulder shots are much easier for chromakey software to deal with. Full Length shots, where the subject is standing on the back screen, creates hard shadows which can be difficult for the software to handle. This is why floor lights are effective. They help eliminate those difficult shadows at the subject's feet.

Flyaway hair and dark shadows at the feet represent two very different problems that Primatte has to deal with. If you're having trouble, one way to approach full screen shots is to divide and conquer the image after the photoshoot.

Before running Primatte, in Photoshop you can select the upper 3/4th of the image. Run Primatte on this area, addressing hair and fabric issues that are more common in the upper portion of the image. When you've dealt with that, invert the selection in Photoshop and run Primatte on the lower 1/4th. We can now deal with the hard floor shadows without having to worry about hair getting in the way.

This technique does require two steps. But it can be considerably faster than trying to tackle a problematic image all at once. Trying to do it in one step often results in losing hair detail and halos in some parts of the image.

Keep in mind that you have a lot of tools at your disposal in Photoshop. A single tool like Primatte may be able to do everything, but quite often you can do it faster if you use several other tools as simple aids.

and lastly...

Do some tests! Please don't photograph 300 kids and then read this article! Do some experiments before you take Primatte and your chromakey setup out to the real world. Better to make your mistakes taking pictures of your own kids than to shoot a school prom and end up hand editing each image.

I hope that you found this information informative. If you have any questions, please feel free to email me at jim@digitalanarchy.com. I'm happy to answer your questions.