

# Light Source: Lighting for Compositing



Among the powerful tools in the digital postproduction toolbox, chromakeying has to rank among the coolest: with a few clicks of your mighty mouse, you can drop your foreground subject into any background you like. Chromakeying is often quite frustrating, however. Though it can be easy to handle in editing, it's an absolute bear in the studio, because the colored background required for the process must be uniformly lit.

Very, very uniformly lit. And while your software might be magic, the key to a good key is good source footage. So let's review the basics of lighting for chromakey; but before we start deploying spots, floods and soft lights, we need to examine the chromakey process to see how it works and where the problems lie.

## Chromakey Compositing

"Chroma" means color in video jargon, and chromakeying works by shooting a subject against a background of a very simple and uniform color. In post, the editing software replaces that color (and *only* that color) with a different shot. The most common example is the map (background) that fills the screen behind the meteorologist (foreground) on the news. That person is actually standing (often jumping around) in front of a solid blue or (more frequently) green screen, which is replaced in the control room with a background image of the jet stream or whatever.

Sophisticated compositing software can compensate for slightly uneven lighting and even distinct shadows (on the Weather Channel, the meteorologists can actually touch the screen). Chances are, however, that your software isn't that smart, so uneven lighting affects the quality of the background image. In theory, you create a perfectly uniform background color by following just three simple rules:

- Light the background perfectly evenly.
- Light the subject separately from the background that you'll key out.
- Keep subject and background as far apart as possible.

Those rules are simple indeed in theory, but in practice they can be frustratingly hard to follow. To understand why, we need to look at the geometry of the background screen, the lens focal length, and distance between the camera, the subject and the screen.

## Backgrounds, Lenses and Throws

To light the subject and background separately, you have to, well, separate them. Four to six feet is a reasonable minimum and twice that distance is desirable. Figure 1a shows this setup in a small, cramped studio or classroom. Because the camera has only five feet of "throw" (camera/subject distance) it has to use a wide-angle lens setting in order to frame the subject in a medium shot.

Uh-oh: because of the wide angle, the frame shows the back wall outside the chromakey screen and the illusion is lost (Figure 1b). If you had a shooting area big enough to move the camera back another five feet (Figure 2a), you could frame a medium shot with a telephoto lens setting and fill the frame with the chromakey screen (Figure 2b).

What if you can't knock out a wall of that little studio to make a bigger one? Basically, you have three options:

- Get a bigger background screen (if the room is wide enough and if you have the money).
- Shoot only closeups, so that the narrower lens angle keeps the background within the screen area.
- Light subject and background together.

The last option breaks two out of three of our chromakey lighting rules, but sometimes you have no choice. So let's start by lighting a setup in our underachieving studio.

### **Small-Scale Chromakey Lighting**

To get a longer camera throw, we start by moving the subject closer to the colored background. Then we light the subject and background together (Figure 3).

First of all, notice that the lights in the diagram are big four-tube fluorescent pans (you can build these out of shop lights and 1/4-inch plywood). Especially when covered with diffusion (they run cool enough to safely use an old sheet) these units deliver the widest, softest and most shadow-free lighting you can produce. Even close to the background, your subject will throw very little shadow and what shading there is will be directly behind, where it is masked from the camera. In a situation with overhead fluorescents, the top and both sides of your background will be washed with soft, even light. (If you like, you can build another pan and hang it.)

Next, note that the lights are placed so far to each side that they light the subject's left and right profiles. That's okay because the ultra-soft lighting wraps around the subject. Also, the setup lacks a key-and-fill look because the lights are identical in type, distance, and angle. That's okay too.

With this combination of lights, background, subject and camera, you're still limited to fairly close angles, but you can get a good clean chromakey.

### **Conventional Chromakey Lighting**

Now let's move up to a slightly bigger studio (Figure 4). With 20 feet of depth to work in, you can pull your subjects away from the background and light them separately. Notice that we repositioned the big pans so they miss the subject.

The subject is lit by a conventional key, which is a spotlight placed a bit above eye-level and aimed to hit three-quarter front. We placed a second spot opposite the first and at eye level. Notice that it's farther away, in order to throw less light on the subject, for a fill-light effect. Why not use a floodlight here? Because you *must* keep the light off the backdrop and only a spot equipped with barn doors can control the light edges well enough to do this.

How about some back lighting to separate subject from background? Sometimes, a rim of light on the subject's head and shoulders can produce artifacts, but in most cases, a backlight will serve two purposes. First, it will help to bring your subject out from the background more strongly. Second, it can wash out any green reflections bouncing off of the chromakey screen. With this setup, you can achieve a fine chromakey talking head -- say, a student sportscaster in front of footage of the high school's latest football game.

## Going Hollywood

Trouble is, that's about all you can do, because the space is still too tight for really creative lighting. For that, you'll need a largish studio. Now you've got a wide background (12-16 feet) and at least 15 feet between it and the subject. Now for some creative lighting.

Say, for example, you're re-shooting Hemingway's *The Old Man and the Sea*, with the actor in a rowboat (that's still on its off-screen trailer so that equally off-screen grips can slowly rock it forward and back to create ocean swells). You're going to key in some actual ocean footage (from a sports fishing vacation) behind it.

To light your larger background, you'll need more ultra-soft pans -- at least one on the floor and one overhead, both centered. Then set up your key as a killer sun effect on the old man in the rowboat.

This light should be high, bright, and as hard as possible (no diffusion and the lamp in the spot position) -- for once in your life, you *want* harsh shadows. Then position a floodlight to provide some, but not too much, fill light. Put the unit right on the floor shooting up into the subject's face. To help the illusion, have a grip wave a hula skirt of newspaper strips slowly in front of a light, to simulate reflections off the water.

Normally, the flood would spill all over your color background, compromising the chromakey effect. But with this much background-to-subject distance, the effect will be negligible. Obviously, this is just one example. The point is that you can achieve all kinds of lighting effects as long as you keep spill light off the color background.

## Chromakey Outdoors

If you need a really broad background, you can sometimes chromakey outdoors, lighting only with reflectors.

For low angles, a blue sky can deliver an excellent background. Here, the trick is to aim as low as you can, while still framing off the ground. The higher you go, the paler the sky becomes. You can then replace the sky with an alien atmosphere.

You can sometimes find a side of a large building that's painted a uniform color: for example a warehouse, a gymnasium or one end of a mall. Beiges and earth tones don't key well, but if you can find a bright, clean red, yellow, green or blue, you can shoot against a background as big as Hollywood ever gets.

To make sure the surface is uniform, set your lens to throw it out of focus. That will suppress the outlines of cinder blocks, metal ribs or whatever. Now place your subject and use reflectors as you normally would.

One caution, however: the sun moves constantly, changing the brightness on the background. If your shooting takes too long, you may have to adjust your key color as you edit, changing it from shot to shot as the sequence progresses.

Good shooting!