



This image uses six strobes to create an even light throughout the shot. The 750 watt-second monolight is just inside the door.

An Approach to Interior Lighting for Photography

Please understand I am not offering rules, but an approach to architectural lighting.

First examine the room for existing light sources, everything from lamps to windows. The thing you want to do is classify those resources, something like friend or foe. So a window that throws diffused light into a room is a friend, and a mercury vapor lamp is a foe. Fluorescent lamps are generally foes, but they can be used under some circumstances, especially with digital.

This understanding of the lighting in the room will give you the information you need to choose the dominant color spectrum you can use in your shot. If you have a lot of daylight then you would certainly light with daylight balanced lights, but if your light is mostly from tungsten sources, traditional bulbs and halogen lights, you would want to work with a color balance of 3200°K, as this is closer to the color of the bulbs. While I would use strobes for any architectural lighting situation, I would balance the strobes to a spectrum similar to the room. One of the advantages to filtering strobes is that these lights will definitely not be included in your picture, which means that you don't have to hide the filters. When I first examine a room I am more interested in the choice of color spectrum than the details of how I will work in that spectrum. Color spectrum is somewhat similar to the key of a piece of music, it tells you what will fit easily and what will be dissonant. Really you have three choices: daylight, tungsten and fluorescent. Fluorescent is the most difficult spectrum to work in because the bulbs can be wildly different.

The next thing to do is consider where a light can be hidden, or where it will be out of frame. Generally there are only a few places you could possibly put a light. Lights outside of the frame are easy to make look natural; a light from either side can always look like a window. A light inside the frame will need to be much more subtle. You can put a light on the other side of a kitchen island to bring up the values on a stove, but if you add a lot of light in a place like that it will look really weird. One important source to consider is bounce light off the ceiling. This can look very natural, but you want to keep the bright ceiling out of the frame and if the ceiling isn't white your color can be ruined.

Finally I look at the room in terms of the best camera positions. Circumstances, such as the important characteristics of the room and the needs of the client will come into play here. Of course I will integrate all three of these considerations into the decisions about light and camera, but the first action I take is to place the



camera.

The camera needs to be first because shadows and reflections are only important from the camera's point of view. The camera position needs to be designed to show the key characteristics of a room, so if you are trying to show size you don't want to back up and use a normal lens. Rather, you would use a wide-angle lens to emphasize size. The height of the camera can also affect the feel of a room, so be aware that eye level is not always the best position.

This shot shows the author with some of the set up. You can see the laptop and the lights with umbrellas. The light on the left side of the shot is the 750 watt-second monolight.

Architectural photography is a very detail-oriented specialty; in order to be sure I get everything right I will tether the camera to a laptop computer whenever possible. There are wireless systems that will allow you to preview your images on a laptop, but a wired system, available with Canon and Nikon, will work perfectly in this situation. Once you set this up you might want to take a quick capture of the shot. This could be done on auto exposure, but it will be the last shot that you take on auto. Examine the shot for angle and any particular problems.

Now, except in the unlikely event that the shot you just made was perfect, it is time to set up the first light. Lighting is the trick. In almost all circumstances I will set up my first light as near to the camera as practical and as high as possible. I use a 750 watt-second monolight for this. I used a more powerful light when I shot 4X5 film. I will bounce this light off the inside of a 60-inch umbrella; I would use a larger umbrella if I had one. The purpose of this light is to open up any shadows from the existing light sources; this brings down the contrast. The large umbrella softens the light and makes any shadows from this light source smaller and lighter. In any situation, a large light source lights a subject from more angles so the shadows have a softer transition. Also a large light source creates more bounce light that will fill in all the shadows. Since the light is above the camera, shadows will fall behind objects and, hopefully, reflections will not go toward the lens.

Next we will try to bring the light into the same spectrum. If you are shooting daylight spectrum with strobes you don't need to do anything, but if you are shooting in tungsten you will want to put a Rosco 3407 CTO, or equivalent, filter over your strobe. This will make the light about 3000°K, which is a movie light spectrum. You may need additional filtration, but you won't know until you shoot a test exposure. If I am trying to balance to fluorescent tubes I will probably use the Rosco 3315 which is the 1/2 Plusgreen. It has worked better for me than the Fullgreen.

You can change the color of the light sources in your shot, but this is not always necessary. If you control the exposure so that the light source has a very bright value, but doesn't add much light to the surroundings you may not need to worry about color. So if the lamp is bright but the light doesn't fall on anything you are probably ok. If the lamps are critical you can replace a tungsten bulb with a photoflood BCA bulb. This runs at almost 5000°K similar to daylight. I can't stress enough that doing this is dangerous. The bulb runs MUCH hotter than a normal bulb, so only turn it on when you are actually exposing. You can also use a Britek or similar strobe with an Edison base, but these do not spread light like a bulb, so they don't always look natural. Additionally you can put a Rosco 3202 CTB Fullblue over a light bulb, but this will also reduce the output of the bulb very substantially. You can also use a Rosco 3308 Minusgreen filter over a fluorescent light source. But because fluorescent tubes are so unreliable, this doesn't always work. The colors of various tubes are very different. And in any building the tubes may have been replaced at different times with different color tubes, really annoying.

If you want to change a window to tungsten balance you can do this too. The Rosco filters are available in rolls, so you can attach the filter to the outside of the window. I would suggest the 1/2 CTO 3408, which is the Halforange rather than the Fullorange as the additional blue will make the color feel a little more natural. The filter material can be reused, which is good because it is expensive.

You can certainly do much of this color control after the shot in Photoshop. There are good reasons for doing so, including the fact that you don't need to buy filters or bring them with you. But there are occasions when you should fix the color while you shoot. If there is a client watching, you would prefer not to tell him/her "Oh, the color? I'll fix that later in Photoshop." Another consideration, if you are shooting a large number of images that will require a similar fix it may be better to avoid having to do a lot of fixing after the shoot. I think it is always advantageous to reduce post-production so you can deliver images to your client sooner.



When you shoot your next test the first thing to check is exposure and color. But don't forget to check for reflections and other problems. In order to use strobes and balance the exposure with daylight there are a few important things to understand. The strobes go off instantly when triggered and have duration of about $1/1000$ of a second. So if part of the sensor is covered when the strobes are triggered that part of the sensor won't be exposed by the strobes.

The author examining the image on a laptop.

Your camera uses two curtains to control the shutter speed and at any speed faster than the sync speed some part of the sensor is covered by a shutter curtain during every part of the exposure. So you if you use strobes at any speed faster than the sync speed of your camera some part of the frame doesn't get the strobe light. You can use any speed slower than the sync speed with strobes. Different camera models have different sync speeds, so you need to check your camera instructions for your sync speed. This also means that changing the shutter speed, if less than the sync speed, doesn't affect the light from the strobe. If you were to take a shot with strobe in a completely dark room it wouldn't matter if the shutter were set to $1/125$ th of a second or 125 seconds.

Long shutter speeds are really useful because you can effectively change the values of the continuous light sources in your shot without changing the light from the strobes. For instance if you have too little light from the windows, but everything else looks good, you can just increase the shutter speed and the strobes won't change. Alternatively if your light fixtures are too bright in a shot just decrease the shutter speed; the lighting from the strobes won't change, but the ambient light will. This property, and the capability to change the power of the strobes gives you a lot of control over exposure.

Since your camera can't read the light from the strobe with its built-in meter you will have to find another way to get the right exposure. You could use a strobe meter to do this, but you have more information available to you in the camera; especially if you are tethered to a laptop. What a meter really does is give you a first guess. You would still need to perfect the exposure by manipulating light and aperture and shutter speed even if the meter gave you a first guess. So I'm going to suggest a guess, ISO 100, $1/60$ th of a second F8 and the strobe at $1/4$ power.

While this won't often be right it will give you a starting point, and that is the point. You want to check the exposure, particularly this histogram on your laptop or the back of the camera. If the histogram is pressed against either side of the graph your exposure is probably more than a little off. You might want to start by making a capture without the strobe; this will make it easier to see what you want to change about ambient exposure and what you need to change about the strobe. One of the great things about digital is that these test exposure are almost instant and free. You should capture your images in camera raw, as this will make it easier to create the perfect exposure after the shot. Camera raw gives you extra exposure information, as a color negative did with film cameras.

If the contrast were too great I would try increasing the power of the strobe. If the windows are too dark then you need to increase the shutter speed. If a single lamp is too bright you might want to put metal window screen over the bulb to reduce the light from that lamp, or put a smaller bulb in the lamp. Metal window screen is really helpful at reducing the light from a bulb or a strobe. You will also need to examine the color and look for problems with the strobe placement. Of course this is also a good time to look for reflections or problem shadows.

Now for many small rooms this one light will work, and for other jobs it might be good enough. But, of course we would really like more than good enough. So let's look at the tools that will allow us to fix those remaining problems.

Since I am using a wide-angle lens with a standard 35mm frame capture area an aperture of f8 is usually sufficient. So I can use lower power lights for additional light sources in most situations. I use 200 watt-second battery powered lights most of the time. The DC power makes it much easier for me to place the lights, as I don't need a power socket. The small size of the strobe head also makes it easier to position these lights. While larger and more powerful lights would work as well the chief goal is to have a large number of strobes. I usually take out seven battery-powered lights in addition to the monolight. The idea is that control over light placement is more important than power.

Umbrellas are the first and best tools for this interior work because they spread light evenly over a large area and create soft light at the same time. As I mentioned I start with a large umbrella. I usually set up umbrellas as bounce off rather than shoot through light sources. This gives me a little more control over the light. However when I am pressed for space I will use a shoot through umbrella. Also If I am shooting a small room, such as a bathroom, I will set up an umbrella as a shoot through. This is especially good in a bathroom because the light that bounces back off the umbrella will bounce again into the shot, and it



Several techniques were used to make this shot work; first I used the small shoot through umbrella, as I often do when shooting a bath. I used a battery powered light in the shower with a juice bottle that had the bottom cut off. Finally removed the reflections in the window by doing a second capture without the strobes, and then I married the two images using Photoshop.

will soften the overall light as well. This extra bounce is the reason I don't have as much control over a shoot through umbrella. Most of my umbrellas have a white satin interior with a removable black back, as this facilitates bouncing light and shooting through the umbrella. I have a couple of silver umbrellas for cases where I want a little harder light or where I need the extra efficiency of this kind of umbrella. While I set-up the monolight with a sixty inch umbrella most of the other umbrellas are forty-five inches, and I have a couple of thirty inch umbrellas for tight spaces.

The broad light from umbrellas is useful for opening up large parts of the shot that are too dark. Often I need one or more strobes with umbrellas at the far sides of a shot in order to keep the light feeling even. Since light is reduced the further you are from a light source it makes sense to add lights to the sides of a wide shot.

I also use the lights with just a reflector much of the time. This lets me put more light on a specific part of the shot. In addition a light with just a reflector will add contrast to the area illuminated. This can help identify some part of the shot as a focal point for the image. I almost always use a barn door attachment when I use hard light in a shot. This lets me control what part of the shot gets the light. I also take along some cine foil, which is a kind of heavy-duty black aluminum foil. It is incredibly useful for controlling light. It won't burn, but you can certainly make it smoke, so you might not want to put it on top of a tungsten light source. A small amount of hard light on top of a softer light from an umbrella can add a sense of three-dimensionality to an image. So I will sometimes use hard light from a similar angle to an umbrella.

There are a couple of trick light sources I use to get me out of a tight space, literally. The first is a bare strobe tube, called appropriately a bare bulb. This is not usually my first choice, but it fits into a small space and it illuminates 360°, which can be incredibly helpful. There are a couple of variations on this tool that I use: the first is a translucent juice bottle from Trader Joes. This is just a pint bottle that fits over the bare bulb. It spreads the light slightly, softening it just a bit. It spreads the light a little more evenly and reduces the output, which makes it useful for a light hidden inside a shot. I have another bottle with the part that was the bottom of the bottle cut off. This spreads light out the sides and gives me a bounce light out the top. This is a pretty useful accessory for a former juice bottle. I use it behind short walls; it gives good light out the side and a ceiling bounce that is easy to hide. While I can imagine using a snoot or grid spot in a shot I don't keep them in my location pack. I would imagine using them to bring up a very specific part of a shot, had this been something my clients specified.

I should say a few things about slaves. These are devices that trigger a strobe when another strobe fires. Having as many strobes as I do I also have a lot of slaves. I generally use a radio slave to trigger the monolight and then use optical slaves to trigger the rest of the strobes. Optical slaves are not always as reliable as one might like, so it is best to have a couple of extra slaves on hand. I often have to put the slaves on extension cords so that they will be close enough to the main strobe to trigger. Still, slaves do let you use a lot of strobes without running cables everywhere, so they are an important part of the tool kit.

The tools in Photoshop that I find most useful are perspective control and lens correction. I usually work with the perspective, or shape of an image, in Photoshop. I usually use the cropping tool to adjust perspective, since it makes my workflow a little faster. When I used a view camera I did this in camera, and I still have a lens designed to give me this kind of control. But the widest lenses don't



This shot was made for the Huntington Library in San Marion California. I did this with Senior Huntington photographer John Sullivan. The largest light is just to the left and behind the camera. Additional lighting at the far end of the hall. This shot is an excellent example of how strobe light can be integrated with existing sources.

have perspective control, so Photoshop is a more versatile option. In addition I have noticed that my widest lens has some barrel distortion, straight lines bow outwards, so I really like lens correction. You'll find this tool in filter under the distort menu.

Photoshop also allows you to fix a number of problems with architectural images, especially reflections. If there is a reflection of a strobe in a window, I take a second shot with my lights turned off. Then I use the image, without the reflection, to fix the image with all the strobes on, in Photoshop. While I would like to be able to fix everything when shooting I can't always get my lights to cooperate.

Of course it requires some patience when you try to make everything work together. I often find that I am working with half a dozen lights, so sometimes I don't know which light is the problem. One important technique is to turn off each light and shoot a test. I would also emphasize working tethered to the laptop. This will save you hours of grief. It is important to remember that musicians like Eric Clapton and Luciano Pavarotti practiced so that they could play.