Tight Budget Chroma Key Lighting

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Lighting a large chroma key drop is not very difficult with a little attention to detail and a few good softboxes or studio multi-source instruments. Unfortunately I was fresh out of the couple of thousand dollars I would need for those lighting instruments. Once again I was on my way down to the local home improvement store to find a miracle.

The keys to lighting a chroma key background are simple. Make sure that you light the surface with an even wash. That means equal luminance across the surface, vertically and horizontally. When possible, use large softlights or multi-source instruments like micro-strips. The soft light will hide the imperfections in the surface and the resultant shadows. Lastly, keep your talent as far away from the background as possible to avoid reflected color from the background on the talent, and to keep the talent from casting shadows on the background.

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There are many concerns with using fluorescent fixtures for video. The ballasts in fluorescent fixtures are notorious for the hum they produce. The light can also have a flicker from the frequency of the ballast. Finally, fluorescent lamps create light through a very different method than tungsten incandescents lamps, so the color reproduction is very different. Industrial fluorescent lamps may look very green or even purple to the camera. Fluorescent fixtures made for video use special hardware and lamps to overcome these problems, but these fixtures can be expensive.

I managed to find a 4', two lamp shop light fixture, like you would hang in your garage, with an electronic ballast made by Lights of America. An electronic ballast instead of a magnetic ballast is the only hope of overcoming the hum and the flicker. With these fixtures there was no detectable sound from 4” away. Surprisingly there was no flicker problem normally found with cheap ballasts either. On top of that, they were only about $15 each. We had a winner for the fixture. Now to find an acceptable lamp for them.

When looking for a lamp, I was looking for a good CRI (Color Rendering Index). CRI is a measure of 'trueness' of colors when measured against an incandescent lamp. A CRI of 100 is the best. Fluorescent lamps made for video have very high CRI's, 95-100. I was looking for the best CRI I could find in a home improvement store. For lamps, I chose the Sylvania Designer® Cool White Plus 40w T12 lamps, $7 a pair. They have a CRI of 80. Most household fluorescent lamps have a CRI in the 60-70 range. The lower CRI of 80 instead of that of the better the video lamps was not a big problem as long as they were consistent across the background.

Most fluorescent lamps are cooler, a little more blue, than the quartz halogen lights used in a studio. That part of the light is measured as color temperature and expressed in degrees Kelvin. Most tungsten studio lights are about 3200 degrees Kelvin (3200K). These fluorescent lamps were 4100K. The color temperature needed to be matched to standard studio incandescents to prevent a change in hue on the background in areas where the talent lighting spilled. Some Roscosun ¼ CTO #3408 gel from Roscolux taped to the front of the fixtures did the trick; $6.50 a sheet from most theatrical supply or photo/video supply houses. That is the orange plastic taped to the front of the fixture in the pictures.

The fluorescent fixtures were attached vertically on stands made from two 2x4's. One stand on each side is at the edge of the floor about 4' back from the background. They are angled toward the middle of the background. The other two are outside of that and facing straight back. The edge of their light is used to balance the brightness on the edges of the background.

With only an 8'x8' floor skirt, the talent has to work only about 5'-6' from the background. Green reflected spill in unavoidable. If you can't prevent it, overpower it. I used two 100W Sylvania Halo Halogen Par38 lamps, $9 for two, in brooder fixtures, $12 each, for backlights. A third one might be a good idea. The halogen Par's have a color temperature that is only about 3000K but that is not a problem for backlights. I just kept them pointed high enough to keep them off of the floor skirt. Brooder fixtures come from the shop or trouble light section of the home improvement store. They can also be found at farming stores. They get their name from originally being used in hen houses to warm 'brood' hens. When choosing a brooder light fixture, look for a ceramic base and at least, a maximum wattage rating of 250W.

Lighting the talent will vary depending on what you need it to look like with the replaced background, but it doesn't have to be expensive either. Be careful to light so that the talent light does not cast shadows or hot spots on the background. I usually angle the lights from the side to take care of that.

For this setup, the key light for the talent comes from two brooder lights with 100W Sylvania Daylight bulbs in them. A couple of brands make household lights that are advertised as being true color and around 3200K. When I tested them, the Sylvania Daylight ones were the closest to standard studio lights in their response when measured on the vector and waveform monitors. The next closest one had a measurable spike in the reds. I haven't found anyone who can tell when I have used the Sylvania Daylight lamp in a brooder fixture or a standard video light. Using two lamps helped soften the key light without having to bounce the light or diffuse it. I angled them so that the key light did not hit the background.

Finally, the soft fill light comes from a Lowel Omni light with an umbrella. It is a standard video light, but it could be replaced by bouncing a few 100W lamps off of a piece of foamcore.

The key to getting your lighting even on your backdrop, is to use your waveform monitor. You are looking for a flat line across it. Raised peaks on the edges mean you need to angle the outside fluorescents out farther and so on. You can almost eyeball it if your placement looks like mine.

The end result is excellent. Even head to toe shots work great. Here are a couple of screen shots captured directly from Sony's Vegas NLE using its standard chroma key FX. Using the Chroma Blur effect in the chain before the Chroma Key effect helps reduce the aliasing normally found in DV chroma keys.

That's how it works. Now go and be creative!

Keith

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After 25 years of entertainment production, Keith Kolbo can now be found teaching video production at an inner-city high school in Orlando, Florida, running A Media Prof.Com, and lurking in the Sony Vegas forum on DMN.