Build Your Own Color Extender!

We've all had situations where, no matter how much bench focus/lamp alignment you do, there's one fixture that burns through dark, saturated colors in a single performance. The typical solution is to buy a color extender, which looks much like a top hat with a color frame holder at the end. Another solution is to use "Heat Shield," available from many sources, or Gel Shield™ available only from Apollo Design Technology. In my opinion, the Apollo product, although more expensive than the competition, is vastly superior. However, it is possible that Heat Shield may not be needed at all. Moving the color media away from the lens, even as little as one inch, may solve the problem. The other issue is that in order to be effective, every Heat Shield needs airspace between itself and the color media. The double-runner slots of some fixtures are often too close to one another to be effective. Now skeptics/critics may say "but there already exist color extenders, top hats and barn-doors that can address this problem." Yes, however, there are times, particularly with wide-angle fixtures, where these devices would be undesirable. The "Do-It-Yourself" color extender is not a solution to every problem, but I have found it useful, especially when working with a limited budget.

This solution is based on a concept by Sean McCarthy, Master Electrician for the Shakespeare Theatre Company in Washington, DC, in a discussion on the lighting forum of www.ControlBooth.com. I elaborated on the idea, built a prototype with parts in stock in my garage, and have proven the design with great success.

insert Picture#1.
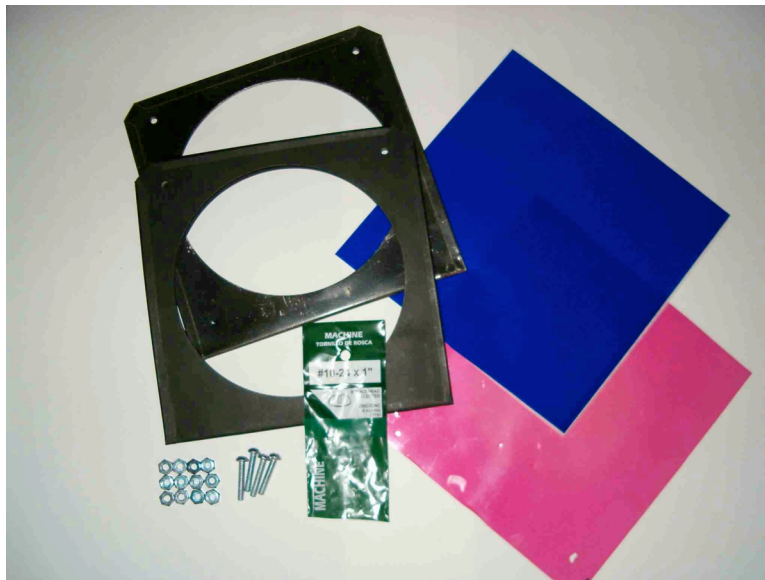
As Picture#1 shows, the only parts needed are two appropriately sized color frames, (4) #10-24 x 1" Round-Head Machine Screws, and (12) #10-24 hex nuts. The picture shows 7.5" x 7.5" color frames, but the color extender can be fabricated equally effectively from 6.25" or 10" frames.

To build the color extender, a total of five holes must be drilled in each color frame. The color frame most likely already has two 11/64" holes at the top right and top left, intended for use with

brass paper fasteners, or "brads" as they are commonly called by electricians, to keep the color media in the frame. These two holes must be drilled out to 3/16" to allow for a #10 machine screw. Three additional 3/16" holes must be drilled.

insert Picture#2.
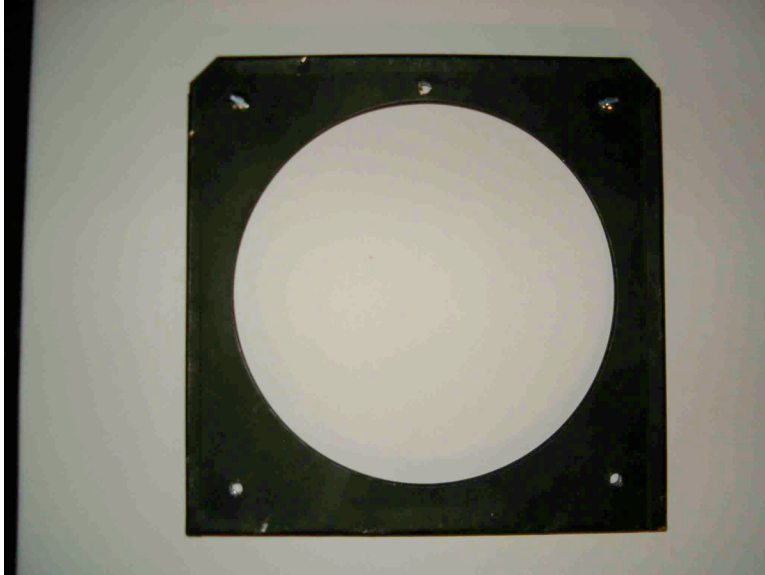
As Picture#2 shows, two holes are needed near the bottom of the frame, matching those near the top corners. A simple way to mark this is to put one frame on top of the other, flipping the upper frame top to bottom. Then use a drill center punch to mark the holes. The fifth hole to be drilled is at the top center of the frame, which will eventually be used with a brad to hold the color media in the frame. A drill press is handy for drilling the holes, but not absolutely necessary. I found that by enlarging the existing holes to 3/16", then using the bolts to clamp the two frames together, the remaining three holes can be drilled though both frames simultaneously, insuring perfect alignment.

Once all holes are drilled, it is best to use a grinder or small rat-tail file to remove any burrs caused by the drilling process. Now open the frames by bending them to about 90 degrees, far enough to get the machine screws through all four corner holes of half of the frame, head on the inside, threads sticking out. Add a hex nut to each of the four bolts, threading it completely against the frame, and tighten. A lock washer may be added underneath the nut if desired, or use an appropriate thread-locking adhesive. Now thread another nut about half way onto the machine screw, and add half of the other frame. Thread the final nuts onto the bolt ends, just until the threads reach the top of the nut. Then spin the inner nuts up until they tighten against the outer frame. Picture#3 shows the project completed up to this stage.

insert Picture#3.

A safety cable can be permanently attached by putting the loop end around one of the top bolts, or the safety can be clipped to one of the top bolts after installation in the lighting instrument.

All that is left to do is bend the color frames back into shape, insert the color media into the outer frame, and brad the top center. When using brads in any frame, I've found it best to pre-punch a hole in the color media with a common drywall screw or awl, as most paper fasteners do not have a sharp enough point on them to puncture the media.

Picture#4 shows the completed color extender. If heat shield is desired or required, it may be placed in the color frame closest to the fixture's lens, with the actual color in the outer frame. For clarity purposes, in the photo a cut of light pink has been used instead of the heat shield, which is optically clear.

insert Picture#4.
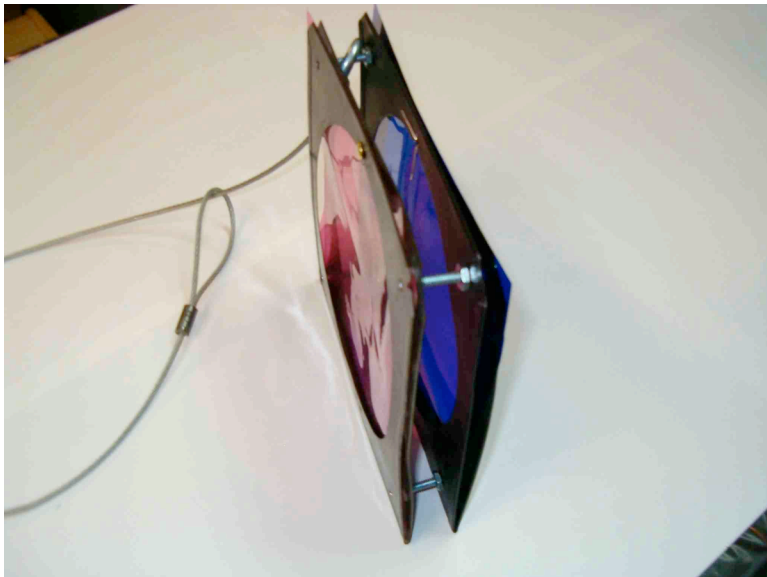
That's it! For the cost of two color frames, of which most theatres have extras, and $2 in Machine Screws and Hex Nuts from the local hardware store, plus fifteen minutes of time, you can make your own color extender, for use with or without heat shield. If the light spill or flare is a problem, the sides can be taped with a product such as BlackTak™ once installed in the fixture, but it would be best to leave the top and bottom open, to allow for convection air currents between the two frames. I hope you find this idea as useful as I have.

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