

The
Strobe
Projector
Project

This image was made by projecting light through a lens. Because of the lens I was able to create shapes of light on my subject. This projector uses a Norman strobe for light, so you can shoot with room light on and the subject can move normally. If I had used an old slide projector the exposure would have been very long. The image is projected from small holes in a piece of foil.



The finished projector. It fits on a Norman LH2400 head.



This is the Norman 5 inch reflector and the glass dome.

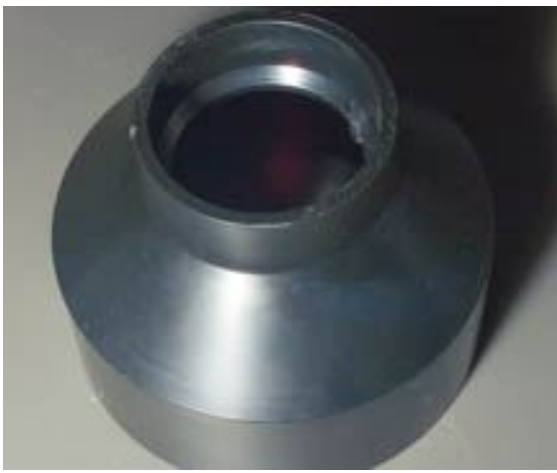


The Norman glass dome. Without this dome you would be projecting an image of the strobe tube.

As photographers our paintbrush is light. If we change the color or the quality of light we can change the appearance of a subject. If we control light we make photographs; if we only capture the light that exists then we may only be taking a picture. If you walk into a good art supply store you'll find dozens of brushes and palette knives and airbrushes, each one designed to let an artist control paints. Photographers use two classes of tools to control light: tools to make light sources bigger and tools to allow you to reduce the area where light goes. We might say broad brushes and pointed ones for placing light into the shot in different ways. Light comes off of a small light source, whether light bulb or a strobe tube, in all directions. People don't generally like this effect, regardless of where it happens. So you don't see many living rooms lit by a 60-watt bulb hanging from a wire. If we make the light source bigger it will be softer. We might do this with an umbrella or a light panel or a soft box. These devices light the subject from more angles by making the light source bigger, so the light has longer gradation, and less definition in the shadows. The other thing we do is to place light onto a smaller part of the subject. We might use a grid spot or a snoot to do this. The effect is more dramatic with strong shadows, which is good if you do it right. Of course there are any number of small strobes, like the SB 900 or the 580 II EX that retain the effect of a small light source and spread the light over only the area you want to photograph. Often the results of this are grim because the shadow and gradation don't suit the subject.



I use a cookie, or cocoloris, with lines cut into it to illuminate the face. You can design any pattern you want into a cookie. So you can project window or stars or lines. I really like the effect of this simple design.



This is a plumbing part. It fits into the Norman reflector and holds the Kodak lens.

There is another way to control light, which can offer very special effects. We can use a lens and project the light. This enables us to put light in a very small area of a shot, or put light with a very sharp edge into a shot. This means you could make a spot that was only a millimeter across. You could make a spot or pattern with a hard edge. You can also project images into a shot. Essentially you do the reverse of what you do with a camera. In a camera the light from a subject comes through a lens and onto a sensor. If the lens is right then the

subject will be recorded on the sensor. But if the image was behind the lens, on a slide for instance, you could put a light behind the image and project it onto a subject. You could also project a pattern onto a subject in the same way. There are a couple of ways to do this, but there are also significant challenges. A few years ago I wrote an article, *Using Slide Projectors for Studio Effects*

(www.siskinphoto.com/magazine/zpdf/Projector.pdf), about doing this with slide projectors. This worked extremely well with film cameras, if the subject didn't move. This was so because there were few issues with very long exposures with film and you could do double exposures easily. I still use the slide projectors, but they just aren't as effective with my digital camera. If you have a slide projector you may want to do some experiments to see how suited they are to your camera.

I have often wanted to use a strobe as the light source for projecting an image. There have been devices made to do this, but most of them were designed to project backgrounds. This is not as useful as it once was, because it is easy to drop in a background with Photoshop. I am not very interested in projecting backgrounds, but am interested in projecting light onto a person's face. Norman makes a device called a Tri-lite, which is priced at almost \$1400 on the last price list I have. The Tri-lite is a strobe-powered projector. They are often available used for less money. I should mention that you would also need a Norman 900 series power pack with the Tri-Lite, as it won't plug into the wall. I used one occasionally when I shot film, and the light output was too dim for my purposes with large format cameras. However, I am sure a Tri-Lite would be powerful enough to be useful with many digital cameras, and it worked well with 35mm film cameras.



I put a warm filter over the lens of the projector to create the gold color on the face. The cookie is the same lined one I used above. I put a small strobe with a blue gel over the bulb behind the subject.

There is another option, a projection box. Dean Collins introduced this design. Basically it uses a relatively small aperture, or hole, between the strobe and what you're projecting. Kind of like a pinhole camera in reverse. It isn't particularly sharp. The image you're projecting should be large, at least 4X5 inches, to make things a little sharper. And it doesn't create a lot of light. So I never got around to building one of these, but you can probably find plans on the web. There was at least one commercially available device built on this plan. There are also some specialized snoots that can project, but again without much sharpness.

I thought about building a projector for some time, but I thought in terms of a slide projector with a strobe behind it. The problem is that a slide projector is really quite complex, so my ideas were impractical. You would need a couple of condenser lenses and, optimally, a very small strobe tube. Recently I found myself thinking about an enlarger rather than a slide projector. Enlargers are basically simple. An enlarger is a light source, a diffuser, a negative carrier and a lens that focuses. No mirrors, no condensers and no auto-focus.

Before I discuss the device I built I have to mention a couple of things. First, never, and that means under no circumstances, use a Dremel tool without safety glasses. You shouldn't use any power tool without safety glasses, but this is particularly true of Dremel and other power carving tools. Second, this projector captures a lot of heat, so you it is best not to build it for any strobe that doesn't have a fan, that means most or all mono lights, including Alien Bees and Calumet Travelites. It is possible you could use this device if you didn't use a modeling light, but I don't think so. If you do build something based on these ideas please let me know how it works for you.

The strobe I used is a Norman LH2400 with a fan. This strobe only works with a Norman power pack. I used a Norman 5 inch reflector and a Norman Diffusion Dome. The dome fits inside the reflector and makes the light even; which is important. If the light isn't even the projected light won't be even. Basically these two items make up the light source of a diffusion enlarger. I went to the plumbing section of a home improvement store. I got some 2.25-inch external diameter PVC and a step-down pipe that steps a large pipe down to a small one. The large side has an external diameter of 5 inches so it fit inside my Norman reflector and the other end held PVC pipe with an external diameter of 2.25 inches. I painted the inside of the step-down pipe white with paint designed for high temperature uses. I used the high temperature paint



This is the filter holder and a couple of cookies. The one on the left hasn't been cut yet.



This is the tube made from PVC pipe. This is the heart of the device. You can see how the filter holder fits on the back.

because heat is a problem. I cut a nail down to about 1/2 inch. I made a hole to insert the nail from the reflector into the step-down pipe. This keeps the step-down pipe from falling out of the reflector. Then I made some cuts, detailed below, in the 2.25-inch pipe to accommodate a 4-inch focal length lens from a Kodak projector. The Kodak lens for a Carousel Projector is a good lens for this project, as it is inexpensive and pretty bright. The focus on this lens can be adjusted by moving it inside the 2.25-inch pipe.

You can't leave the modeling light on very long, even with the fan on. But you can use it to position the light or the image. Because the light can be so detailed, this is important.

The most involved part is the tube that holds the lens and the filter or slide holder. I used a Series 7 filter holder to hold the filter or slide. Most of the devices I have experimented with so far are cucoloris, or cookies, these create a pattern of light. I have also used a slide

to project an image. You can see where the holder fits at the back of the tube. The finished version of the tube is 4 inches long. There is a slot that is an inch and a half wide and two and a half inches long cut into the side. I cut the slot with a Dremel tool. This is quick, but you do need to be very careful. There are three other cuts made into the front of the tube that are the same length as the wide slot. These make the tube expand enough to hold the lens. On the other side I ground out the interior of the tube enough to fit the filter holder. You could do the same thing with 52mm filters, but you would probably have to remove the glass filters. I used the Dremel tool to do the grinding. Dremel tools are very versatile. There is nothing special about the Series 7 filter holders, except that I had a couple of them that I had no other use for. You would probably need two 52mm filters so you could put the cookie or the slide between them. I made the cookies from cine foil. I also needed to cut a mask of cine foil for holding and projecting slides. I cut

the foil with an X-Acto blade and other tools. This tube is really the only significant part you'll need to build and it isn't terribly difficult. Although I did have to build four versions before I got it right. Fortunately it is made from PVC, which is very cheap.

The projector is not very bright, especially with a cookie or slide in place. At ISO 100 and 10 feet, with out any cookie the meter reads f5.6 so the guide number would be 56. Most of the time you won't be using the projector very far from the subject, so it is bright enough. You can focus by moving the lens in the tube. This gives you considerable control over the image. Of course you can also change the position and direction. The difficulty is making changes to the projected image while shooting. If the projector is near the camera, as it was for the demonstration images, it can be reasonably convenient to shoot. One hand can control the projector and the other can trigger the camera. If you are projecting a background or lighting the side of a subject than it is more difficult to arrange the image. A remote control release for the camera might be useful, or it might be helpful to work with an assistant. You can use the device to project a background, but the problem with backgrounds seems to be the low power level of the projector as well as the difficulty of getting it in place. Part of what makes this difficult is that when you are at the projector you can't also be looking through the camera, so what looks right might not be right.

This is an incredible lighting tool, and it is worth the time to fabricate this tool, if you have a strobe that will work. If not you can do many of the same things with a slide projector. You could also look at a used Norman Tri-Light and a power pack. You might want to try using an LED light as the modeling light, because it would create less heat. Also the Norman strobes aren't very efficient so you might find a lower powered monolight would do the job.



John Siskin, the author, shot with the strobe projector. He stands in for his own tests.