

# Slide (Film) Scanners

The Swiss Army Knife of the Digital Darkroom  
by George Carlson

The purchase of a slide scanner can turn your computer into a valuable tool for your photographic pursuits. It can be the key for making your move from film-based photography to the expanding realm of digital photography.

The most obvious use of the slide scanner is to scan 35mm slides into the computer for processing by Photoshop or one of the other tools available. Today, desktop slide scanners capable of scanning at 4000 ppi (pixels per inch) are commonly available. Think about it, if you scan a typical 36x24 slide at 4000 ppi, this will yield a 20 million-pixel file. This is equivalent to a digital camera with a resolution of 5600x3700.



Slides are not the only thing that a slide scanner will handle. Most slide scanners are also capable of scanning 35mm negatives with the same high resolution. This is great for scanning older negatives from the family archive. In effect it can turn a cheap disposable camera into a super high-resolution digital camera.

Formats that can be scanned are not limited to just 2x2 slides. Un-mounted strips of 35mm film can also be scanned. Scanners can be used to acquire the images from old 35mm movie film and filmstrips. Having a scanner can again make it possible to use those old half frame cameras like the Olympus Pen. Shoot the film, scan it, and print or publish to the web.

Would you like to shoot and process B&W film, but don't want to mess with an enlarger? No problem, the scanner can do a great job scanning your B&W negatives. There are even special ink packages available to enable an inkjet printer to produce very high-grade B&W prints.

Stereo (3-D) photography is becoming popular now after a long idle period. Stereo photography was all the rage in the fifties when Kodachrome was King. People lost interest in stereo photography because the viewing of the slides required special stereo viewers or very expensive projection systems. The cameras were very well built, so well, there are still plenty available on the used market. Although the "Stereo Realist" is prized by collectors, it is a difficult camera to use. Find a Kodak, TDC, Wollensak or Revere and they will be easier to operate and take very nice photos.

These cameras all use normal 35mm film. Shoot your favorite slide film. If you send it out for processing be sure to tell them not to mount the slides. The frames are usually a half frame in size and are in pairs (one right, one left). The right frame is separated from the left frame by two other frames from other pairs. Once you figure out the sequence, it is not hard to find the proper pair to make your final image. The slide scanner is the key. With the scanner you can acquire the image pair and process the pair using Photoshop or other image programs.

There are several ways to view stereo images. Stereo pairs can be printed or put on the web as either parallel viewing or cross-eyed viewing. These are referred to as free-viewing. Another handy way to do it is to create an anaglyph. This is the image that is viewed with special glasses with red and cyan/blue filters. Before computers, anaglyphs were difficult to produce, but now they can be generated in a few seconds. A good web site to start learning about stereo photography is <http://www.stereoscopy.com/>.

Another interesting thing to do with 35mm slide film is Panoramic photography. Hasselblad makes a camera called the X-Pan. This camera shoots a 35 film with a frame size of 24x65mm. A more affordable panoramic camera is the Russian built Horizon 202, which can be purchased new for just over \$200. It is a swing lens camera that shoots through an arc of 120 degrees. This camera produces an image of 24x58mm. Although both the X-Pan and Horizon make images that are too long to scan in a single pass, most slide scanners can be persuaded to scan it in two operations. If the scanners exposure is fixed, the two images will weld together absolutely perfect using your image editor.

### **Things to look for in a slide scanner**

I have used several desktop slide scanners over the past five years. The scanners that gave the best results were those that could do a good job in the dark areas of the slide. Since slide film has a tremendous dynamic range (difference between light and dark areas) it is difficult to design a machine that can handle the range without blowing out highlights or blocking out the shadows. Noise in the shadow areas is also a problem. In my experience, the Nikon 4000ED has got to be one of the best. The Nikon IV ED and the older LS 2000 are also great scanners. I would expect that the units built by Canon are also excellent, but I have never used them.

Scanning slides on a flatbed scanner is a difficult as best. Flatbed scanners are designed for reflective objects with dynamic range in the order of 32:1. Slides can have a dynamic range in excess of 1000:1. It just doesn't make good economic sense to build a flatbed scanner capable of super high dynamic range and resolution when it has to compete on the market against other flatbed scanners. If you want to scan documents or prints, get an inexpensive flatbed and leave the slide to the slide scanner. That being said, I have had pretty good luck using a flatbed scanner with a transparency adapter (Epson 1640SU) for scanning medium format and 4x5 transparencies and negatives. In this case the large size of the film helps make up for many of the flatbeds weaknesses. I have also just received a new Epson 2450 Photo Scanner. This does quite well on 35mm slides, but not up to the ability of the Nikon 4000ED. See the section at the end comparing these scanners.

Some slide/film scanners use an extra fourth channel to detect dirt and help automatically clean-up slides. The dyes in E6 film are transparent to infrared light. A feature called

ICE uses the fourth (infrared) channel to detect dirt and correct the scan. This is great for older slides that have a lot of dust and dirt. I have noticed that on the Nikon scanners, the use of this feature causes a slight softening of the image. Whenever I scan new, clean slides, I turn this feature off, and the slides scan with incredible sharpness. Keep in mind that this feature cannot be used on either B&W negatives or Kodachrome slides.

Remember, unless you require the immediacy of a digital camera, a good slide scanner and some fine grain film can give you much higher resolution and versatility than current digital cameras.

### **Comparing Flatbed Scanners with Dedicated Slide/Film Scanners**

Below is the output of two currently available scanners. Both are fairly high-end desktop devices. The scan on the left was done at 2400ppi on an Epson Perfection 2450 Photo flatbed scanner. The scan on the right is from the Nikon 4000ED slide/film scanner at 4000ppi.



Epson 2450



Nikon 4000ED

Notice the Epson scan is softer and does not carry the same color saturation. The scan on the Epson took 147 seconds. The scan on the Nikon, even though it was higher resolution, took only 72 seconds. Considering the fact that the Epson flat bed with the transparency adapter costs only about ¼ of Nikon does, it does seem to be a very good value. But, if you do very much slide scanning, you will soon see that the Nikon's resolution, color accuracy, and speed are necessary.

I have done some 4x5 transparencies on the Epson, and they are quite good. The soft color saturation can be pepped-up in Photoshop, and at 4x5, sharpness is not a problem. A 4x5 transparency, scanned at 2400ppi, yields a 100 Mega-pixel image that requires a 300MB TIF file! Now there's resolution.