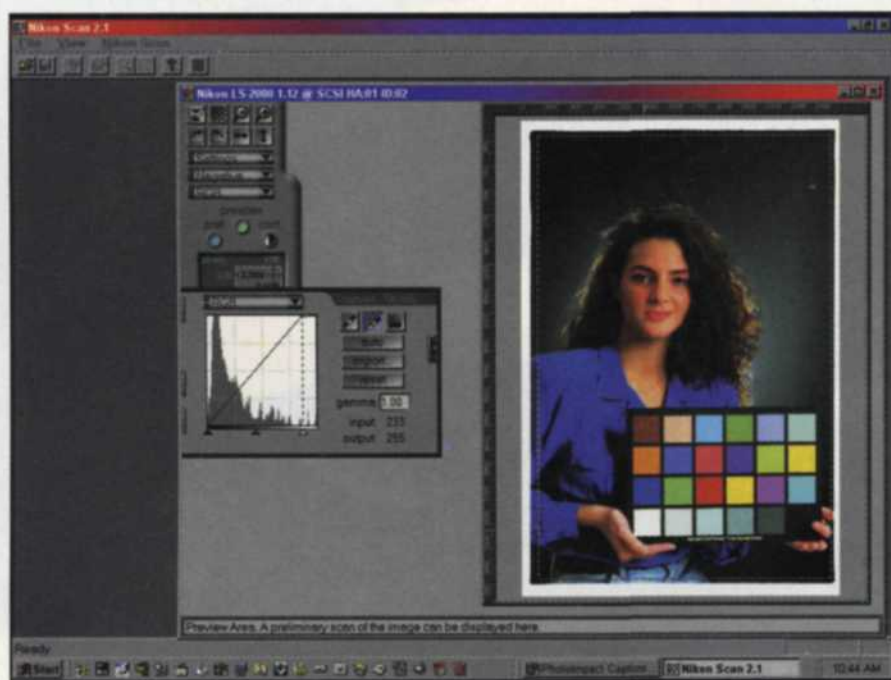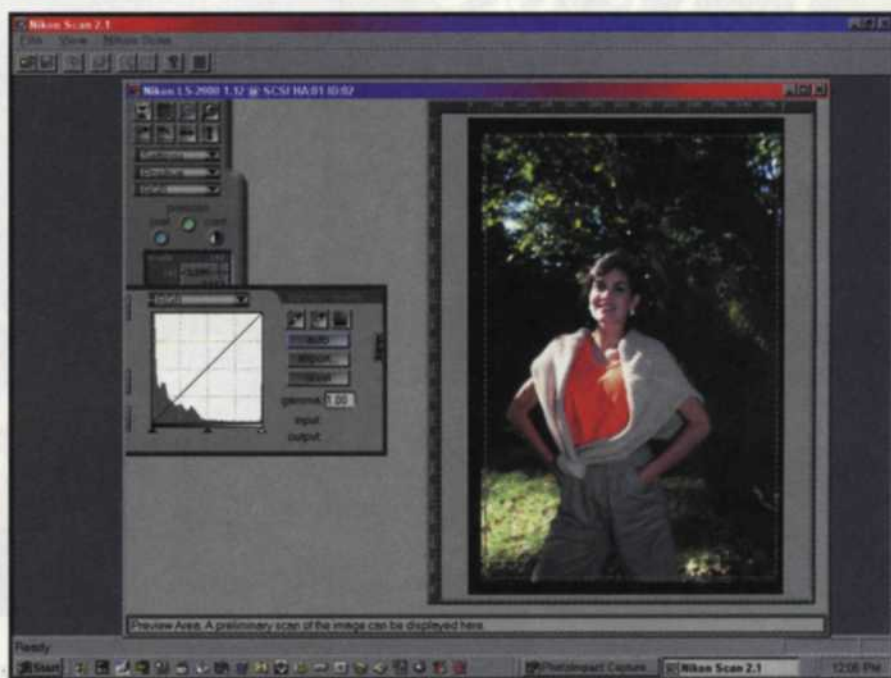*2¼ scan on Agfa Duo Scan T1200.*

4x5 black-and-white negative on Agfa Duo Scan T1200.

Scanner test chart created in our lab.

Nikon LS2000 scan screen showing gamma control.

Making a Good Scan

Jack and Sue Drafahl

THE MOST POPULAR bridge between traditional photography and the digital world is the scanner. A few years ago these electronic marvels cost more than most pocketbooks could bear. Even if you could afford one, they were difficult to use and obtaining a good scan was really tough. Today, technological advancement has brought the cost down so low that even beginning amateur photographers are jumping into the ring. And the software running scanners has become so efficient and easy to use, that it is no longer difficult to make good scans.

Unfortunately, there are many aspects of scanning the software and hardware manufacturers don't always tell you about. Over the years we have collected a notebook full of scanning problems and solutions that come from our experiences, the experiences of other digital photographers, reference material and information collected from the Internet. No, we don't have all the answers, but it is our hope that new scanner owner can avoid some of the headaches we have encountered by using some of this information.

**Match the Scanner to Your Photographic Needs**

We are assuming that if you are reading this article, you have already purchased a scanner. If not, make sure you do your research. Try to determine the most impor-tant use of the scanner. Will you be scanning 35mm, 2¼, 4x5s, or flat art? We have found that if you plan to scan 35mm images, you will need a dedicated film scanner such as the Nikon LS-2000. Flatbed scanners do a great job with the larger formats, but usually cannot match the quality of a 35mm film scanner. If you will be scanning both small and large formats, then two scanners are the best solution.

If you plan on using a flatbed scanner for scanning medium and large format images, look into scanners that have image trays specifically designed to hold the different image formats. In our digital lab we use a Nikon LS-2000 for 35mm, and an Agfa 1200 DuoScan for the larger formats and for flat artwork.
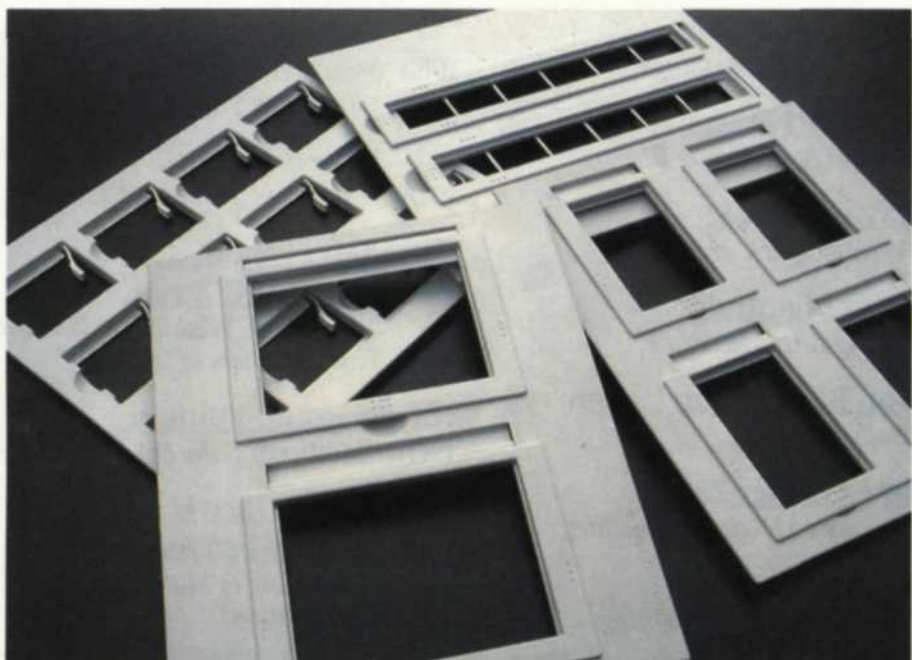
All film carriers for T1200 for Agfa Duo Scan T1200 35mm, 2¼ and 4x5; plus the scanner accommodates full-size flat artwork.
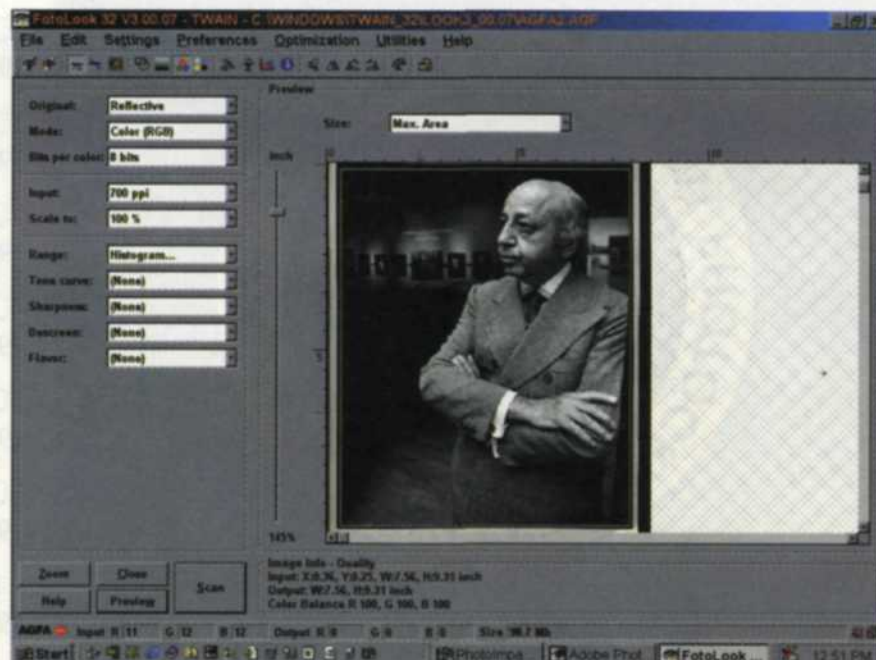
Screen shot of color scan of black-and-white image. Sometimes you get better tonal values from black-and white scans by making a color scan of the original. (Image of Josef Karsh taken by Jack Drafahl at Brooks Institute of Photography, Santa Barbara, California.)
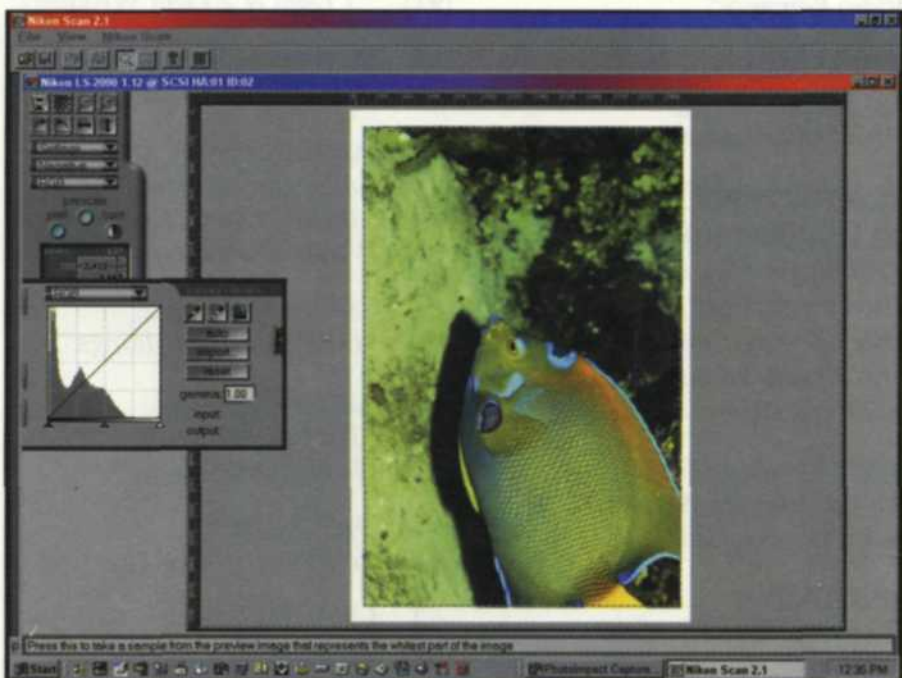
Screen shot—35mm color negative scan using auto feature to show that not every image will scan using autoscan. Some nature images and compositions with all one color need to be scanned with all auto controls off.

Exposure adjustment tool in Agfa Duo Scan T1200 software.

Before You Make That Scan

The computer monitor is your visual connection with the scanning process. If it is not correctly matched to your scanner and output devices, the results will be inconsistent. Until recently, setting up a monitor was a hit-or-miss proposition. Most software packages had a simple program for balancing the gamma, but that was about as far as it went. Today, there are some very sophisticated color management programs available to help you balance your entire system. If you plan on going this route, give yourself plenty of time to read the information and help files on using the system, as color management is very complex.

On the simpler side, you can upgrade to Adobe PhotoShop 5.0 and use their Gamma Loader/Monitor setup program to get you system in line. This program adjusts the brightness, gamma, and color balance using software controls.

Once you have your monitor balanced, make sure no one touches the monitor controls. Someone playing computer games adjusting the monitor to see better, for example, can wreak havoc with your scanning process. Watch excessive window light, avoid any color in the surrounding area, make sure you let your monitor warm up before using it and use the same low-light conditions every time you edit. Set a color chart or MacBeth color chart, near your editing area to give you a neutral reference point.

Traditional Clean Lab Rules Still Apply

Dirt and dust scanned with your images creates excess work in the editing process. It is a lot easier to clean the images before they're scanned. We use both a negative brush and compressed air to clean each image. We use the brush first to knock the dust loose and then blow it off with compressed air. Particles embedded in the emulsion should be left alone and edited once the image is scanned. Don't forget that cleanliness starts at home, so be sure that the scanners themselves stay clean. Cover them when they are not in use, and clean them often.

Become an Expert with Your Scanning Software

After you install your scanner and related software, read over the extensive instructions closely. Don't skip this step, read it all! It will pay off in the long run. Push all the software and scanner buttons to see what they do. The more comfortable you are with your system, the quicker you will be able to perform the edits.

Many flatbed scanners include a color

chart for you to scan in and use as a test image. If one is not included, you can shoot your own image. We like to use a person holding the MacBeth color chart as our test image. If you have been using a small white-and-black card to the side of your studio shoots, continue doing so. The card can be cropped out after the scan is made.

Run your test image through the entire process—scan it in, preview it, and output it to your printing device. Sometimes the results from your output device don't match what you saw on your monitor and will require a little adjustment. Eventually, all three devices in this scanning process should match.

Experiment and try a variety of images at different resolutions until you have a good handle on how the system works. Work with the black and the white point of an image using the manual and auto function. Get very comfortable with the Undo function as this will be your best friend. The more you learn by experimenting with a few test images will quickly pay off in speed and quality down the line.

Match the Scanning Resolution to the Final Product

We often hear of photographers scanning in all their work at the highest resolution. Then they turn around and complain how slow the digital process is compared to the old silver process. We once had a client ask us to scan in a portrait of a company executive at the highest resolution possible. The resulting file would have been over 80 megabytes. When we asked him what he was going to do with the digital file, he informed us it was going to be used in a company newsletter. As it turned out, the required file was only 500k in size.

Unfortunately, there is no universal chart showing the scan resolution necessary for all applications. Best bet is to look at recommended scan levels from other photographers, magazine articles, reference material and make then up your own chart.

Most offset printers will tell you to set the image size to the actual size you want printed and then double the dpi used by the printer's line screen. For example, if you are scanning an image for a journal that will be printed 4x6 inches with a line screen of 133, set the scanner image to 4x6 inches and scan at 266 to 300 dpi (at least double the line screen).

Another method we use for scanning images to inkjet and film recorders relates to file size. Since file size is only one number, we find it faster and easier to set up images for a scan. All the scanners we have seen and worked with have dpi, page size, and file size as part of the pre-scan information.

File Scan Sizes

We use the following file scan sizes for images in our digital lab.

Inkjet
Mural = 128MB+
20 x 24 = 80MB
16 x 20 = 36MB
11 x 14 = 18MB
8 x 10 = 8MB
5 x 7 = 5MB
Smaller = 2MB

Film Recorder
Internet = 1MB
Presentations = 8MB
Stock Images = 18MB
Color negative = 36MB
4 x 5 film = 36MB to 128M
(application based)
8 x 10 film = 36MB to 128MB
(application based)

Magazine Submissions
Less than full page = 8MB
Full page = 18MB
Covers = 36MB

Scanner Adjustments During Scan

When you look at the scanning controls, you will see an overwhelming number of functions. We have found that if you work with brightness, contrast and gamma controls until the preview is very close to what you want, stop there and do no more. The controls in your editing program are generally better than the scanner's, so leave the fine-tuning to the editing process.

The scanning process generally needs at least one sharpening pass before you save the file. You have the choice of doing it during the scan or during the editing process. We highly recommend doing it during the editing process because it generally does a better job, and you can experiment with different levels of sharpness. If you don't like it, just undo it and not have to re-scan it.

The one control we do recommend performing during the scanning process is de-screening. If you are scanning offset printing you will pick up a moiré pattern.

De-screening is a special command in the program that reduces this effect automatically without requiring experimentation. The only thing you have to know is the approximate line screen of the copy. Most high quality magazines can be de-screened at 133 dpi.

Editing Your Scan

You should never assume that your image will scan in perfectly. That's why you have an editing program! PhotoShop 5.0 is the main program that we use as it has excellent editing tools. Learn how to use the gamma, white point, black point, histogram, un-sharp filter, and the clone tools. Use the zoom tool to enlarge the entire image to a point where you can see the grain. Move through the image by scanning left to right and up and down, until you locate and remove all artifacts left in during the scanning process. Finally, compare the final image to the image you scanned in. If it doesn't match your expectations, you can either tweak it some more, or start over with a whole new scan. Scanning is like everything else in life, practice makes perfect. The advantage to scanning and editing is that you have the luxury of the undo function!

Jack and Sue Drafahl are freelance journalists/photographers living in the Pacific Northwest. They have owned and operated a custom lab and service bureau, Image Concepts, for many years. They can be reached at: [concepts@pacifier.com].