Making a Scan from a Slide or a Negative

By Sharon Gumerove

Here is a step-by-step look at how we produce scans at NYI using a slide scanner. For the purposes of this case study, we are using a dedicated film scanner and a Windows-based operating system. Realize that every film scanner comes with its own software so there may be differences in how your scanner works compared to our example. Scanning negatives and film can seem quite overwhelming at first, but the more you scan the easier it will become.

Scanner: Nikon Coolscan
Scanner software: Nikon Scan
Original art: 35mm slide
Intended output: 5x7 inkjet print @300 ppi

1. Turn on your scanner first, before you turn on your computer, especially if your scanner interface is a SCSI connection.

2. Turn on your computer.

3. Start the scanning software, in this case, *Nikon Scan 2.5*, by double clicking on it. Alternatively, if you are used to Adobe Photoshop software, you can launch Photoshop first and then use Photoshop's File menu, choose Import,. This allows you to use your scanner's software through Photoshop.In this example, we will be scanning without using the scanner plug-in through Photoshop.

4. The scan window in *Nikon Scan* or any other scanning software is where you would preview and crop the image as well as select input and output size, resolution, and adjust scan settings for sharpness, color balance, and contrast. As you can see, there's quite a bit of information available in main screen, but there are settings hidden in menus below. Make sure that you carefully check your settings to make sure that haven't missed an important one that may not be visible.

5. **Insert** your slide into the scanner with the proper orientation. You will want to check with your scanner's manual to find out whether the emulsion side should be down and which way to orient a vertical image as opposed to a horizontal. It is also a good idea to correctly **clean** your slide or negative before you insert it into the scanner to eliminate dust. (If you are scanning a negative, most film scanners will come with a separate attachment into which you will need to place the negative, making sure to line up the frame you wish to scan in the proper opening.)

6. Choose the type of film that you are scanning in the **Media Type** setting. In this example, I am choosing Positive since I am scanning a slide. (If I were scanning a negative, I would choose **Negative** as the type.)

7. Choose a color space or color mode depending on your scanner. In this example, I've selected **Calibrated RGB**. Nikon offers two different options here: **Calibrated RGB** in which colors in the scan are represented by red, green, and blue; and **CMYK** (cyan, magenta, yellow and black) which many professional printers will require since it emulates the inks used in printing presses. Unless you have a specific reason to do so, you are best sticking with RGB.

8. Select the Preview option. You can choose to preview your image after you have made your resolution choices, but I find it is easier on this scanner to preview the image first. Once you have selected the Preview option, the scanner will make a low resolution preliminary scan and your image will appear onscreen.

9. Next, you will want to Crop your image using the cropping tool if your scanner has one. The *Nikon* scanner doesn't have a special tool for this, so I have to hold the mouse button down while drawing over the area of the image that I want to scan. This creates a dotted line around the image. It is important to carefully crop your image since many scanners will base automatic settings like contrast and color balance on the entire screen unless you tell it otherwise. This can adversely affect the quality of the image since the scanner will assume the black portion of the screen is part of the photo.

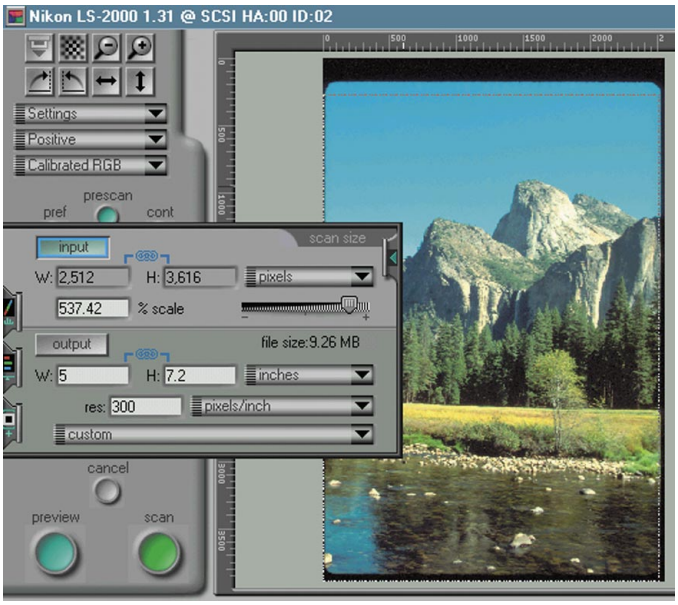
10. If your image appears upside down or you are not seeing the whole preview image, this is a good time to find the **Rotate** tool and change the orientation of the preview image. This is important because it is much more RAM intensive to have to change the orientation after you have scanned the image at final resolution.

11. Now it is time to adjust the **Resolution Settings** for this image. *Nikon* hides the resolution settings behind a "drawer," requiring me to click to open the resolution dialog box. It is important to make sure that you know where these settings are in your scanner's software otherwise you won't be able to adjust the sizing correctly. Remember, you need to know the *optimum resolution for your output device* and know what *size* image you require *before* you make your scan. In this example, Nikon's software has already put in the Input size based on the cropping around the preview image.

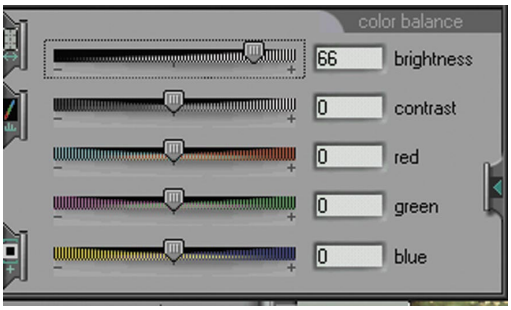
12. Since I wish to produce a 5x7 inch print to reproduce on my inkjet printer, I change the **Output Size** to 5x7 and I change the **Resolution** to 300 pixels per inch. Notice that this will change the scale setting as well. Keep in mind, that the resolution settings box for your film scanner may ask for all or some of these settings. Some may simply ask you for the resolution, which means you need to choose adequate resolution for the size of the image that you need based on the output. It is important to understand the concepts on resolution that we've explained in Unit Two so that you know how to adjust the resolution correctly. There are resolution charts in the Unit Two Study Hall which will help you as well.

13. Now it is time to optimize the color balance of the scan. Depending on your scanner, you can do this a number of ways. Nikon has a **Curves and Levels** dialog box as well as **Color Balance** slider controls. Depending on your scanner, you may have both of these options or other tools to control the color values of the image. On the *Nikon* scanner, the Color Balance sliders affect the whole image, but finer adjustments can be made using the Curves and Levels histogram.

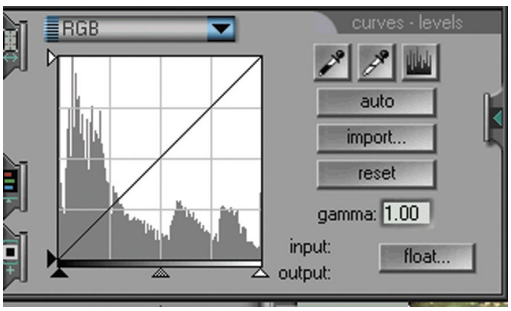
14. **Curves and Levels** dialog box shows a histogram of the image. A histogram is a graphic representation of the photo. We'll be explaining how to use histograms as well as curves and levels within Photoshop in Unit Three. The histogram is adjusted in order to improve the image by sliding any of the three triangle indicators on the bottom or the left side of the histogram. The triangle



Resolution settings dialog box.



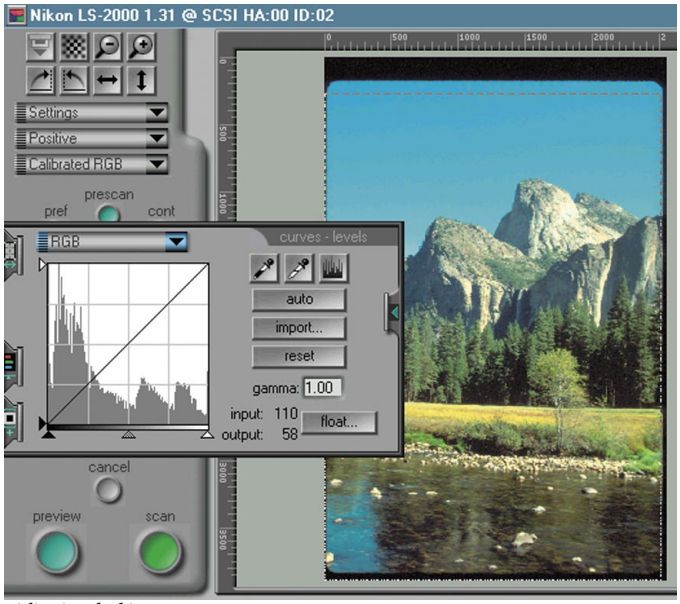
Color balance dialog box.



Curves and Levels dialog box.

indicator on the bottom right represents the **Black Point** of your image, the one on the right represents the **White Point** and the one in the middle adjusts the **Analog Gain**. The black and white points refer to a spot in your photograph that is black or white. Some scanners will automatically set these points, assuming that your image has both a black color and a white color in the photo. If you find that your color is way off and you can't correct it using these sliders, you might try turning the color management system off, since your picture may not have a black color or a white color in it. Sliding the Gain Control adjusts the exposure values of your image,

making it lighter or darker. You will want to experiment with these sliders to see what effect they have on the preview image. You can even work with specific color channels rather than the entire image, for instance just adjusting the Red channel and not the Green or Blue. For the most part, you will want to make sure that the black point and white point indicators line up with the far edges of the histogram. Most film scanners should do a good enough job setting these levels automatically, so you shouldn't need to make major adjustments to the curves or levels of an image.

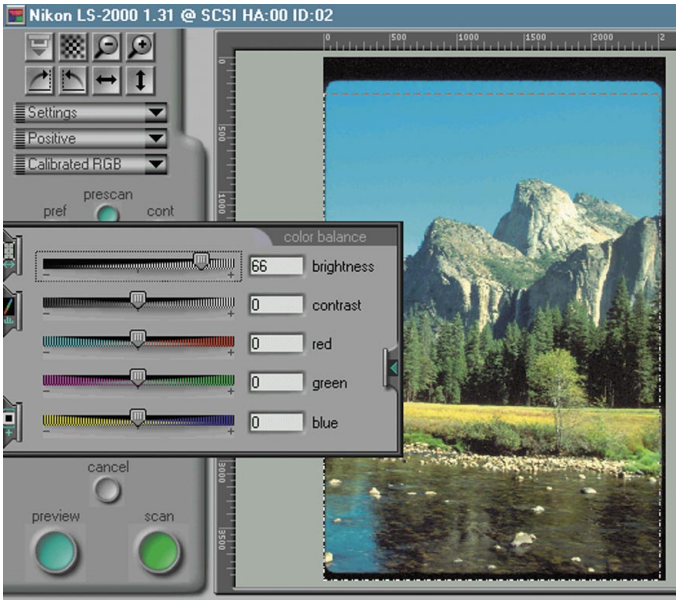


Adjusting the histogram.

15. Adjust **Color Balance** by using the sliders. You can change the appearance of the scan by changing the contrast and brightness as well as adjusting the red, green and blue color balance. Any of the adjustments made are visible in the preview image.

16. I have adjusted the levels and color balance to my satisfaction, it's time to select the Scan option in order for the scanner to perform the final scan. Depending on the resolution and size settings, it can take quite a bit of time for the scanner to accomplish the scan. After the scan is done, the scanner will open another window and allow me to save the image, or, if I was scanning through Photoshop, return the unsaved image into Photoshop for further manipulation.

17. There are a number of other controls that your scanner may have. For instance, Nikon offers these features which can commonly be found on other film scanners as well:



Adjusting Color Balance.

a. **Focus Button:** This button will perform an autofocus on the slide and in some scanners will allow you to click on a specific point to focus on within the preview image.

b. **Sharpen:** Because slides and negatives can lose some resolution during scanning, many scanners come with controls that will automatically sharpen the scan. Sharpening works by increasing the contrast between adjoining pixels. This feature should be used sparingly though because over-sharpening can cause an image to look "digital" or pixelated. So, we recommend that you do any sharpening of your scan later in the digital darkroom. We will show you how to sharpen your image in Photoshop which will give you the best results with the least amount of damage to your image.

c. **Dust and Scratches:** Some scanners offer technology such as Digital Ice which will automatically remove scratches and dust from your scan. Of course, the tradeoff is some degradation in the image, so it's always a good idea to start with a clean slide or negative. You may also find that you will have more control in removing these problems from within Adobe Photoshop.

d. Multi Sample Scanning: If you are not satisfied with the quality of the scan that you are getting, you can use this setting which allows the scanner to make several passes over your film and combine the scans into one. This can increase the quality of the scan that you receive, but it can also take considerably longer for the final scan to be completed.

e. Bit Depth: Some scanners will allow you to choose a bit depth. As we've explained in the Lessons, bit depth refers to the amount of colors that can be represented by any pixel in the image. Higher bit depths will yield better color but also larger file sizes. In Photoshop your images will be reduced to 24 bit (or 8 bit per channel). The 24 bit is the minimum depth you should use for now. If you find you get better results from the higher bit depth settings then use them. Thorough testing accompanied by critical visual inspection will reveal how your systems output meets your personal requirements.

Here are some additional film scanning tips:

1. Read your scanner's manual carefully to make sure that you understand the settings and haven't missed something important.
2. Make sure that you have cleaned your slides and negatives before putting them into the scanner. Dust can be a big problem. Not only is it hard to remove from the scan, but it doesn't do the inside of your scanner any good either. To learn how to clean film, check the Unit Two WebCenter.
3. If your scanner has settings for the type of film you are using, take advantage of them. Slide film, for instance, can have radically different color balances than other types of film, so these preset values can be a big help.
4. If your scanner doesn't offer preset values for the type of film you use all the time, take advantage of the ability to save your own settings and load them whenever you want to scan that type of film.
5. Make sure that you create a directory of folder on your computer for photo scans. Saving scans to one central folder makes retreiving them later much easier.
6. If you find that your scanner is crashing and you are using it through a digital imaging program, it could be that you don't have enough RAM. Try scanning using just the scanner software, after you have rebooted. This will clear the RAM.
7. Some scanners will calibrate automatically, but if your scanner has a manual calibration button, it's a good idea to calibrate the machine by hand whenever it has been on for quite a while and you haven't been scanning. Check your scanner's manual for information on this as well as for recommendations on warm-up times. Some scanners will require that the machine is on for a few minutes before you use it.
8. Some scanners, like the *Nikon* in this example, offer a prescan mode that is meant to be used with negative film. It allows you to choose between several different contrast settings based on the image.
9. Finally, pay careful attention to the resolution and size settings. Review the information in Lessons 7 and 8 as well as the resolution charts in the Unit Two Study Hall.