

Nikon

Software Reference for Scanners

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Read This First

About this Manual

This software reference contains instructions for using Nikon Coolscan (LS-10 and LS-10E), LS-3510AF, and LS-3500 scanners running on either an Apple Macintosh computer or an IBM PC or compatible computer under Microsoft Windows 3.1 or later. Use of this manual assumes that the user has a working knowledge of the relevant operating system. Where possible, Nikon has attempted to make both versions of software as similar as possible in feature set and interface design. There may be occasions, because of operating system dissimilarities, where the two versions may not match exactly. The explanations in the respective platform sections may also differ for that reason. Specific references to Coolscan apply to all Coolscan models. Specific references to model LS-3510AF may apply to model LS-3500 as well.

Commands that are taken from the user interface are shown using HELVETICA type. Cautions and Notes are printed in **boldfaced** type with a triangular warning marker located in the margin.

The Package Contents

Listed below are the components of the Nikon Software Reference for Scanners package:

- Nikon Software Reference for Scanners
- Nikon Scanning Software for Macintosh
- Nikon Scanning Software for Windows
- Nikon User Registration Card
- Sample 35mm Slide

User Registration

To receive the latest product information and software updates from Nikon, please complete the enclosed registration card and mail it today!

Minimum Macintosh Scanning System Requirements

- Macintosh family of computers with SCSI interface (for use with Coolscan or LS-3510AF SCSI models)
- Macintosh System 6.0.5 or later
- 32-bit QuickDraw (when using earlier than System 7.0)

- 8 Megabytes of RAM (more recommended)
- 80 Megabyte Hard Disk (300MB or more recommended)
- National Instruments NB-GPIB card with cable (with LS-3510AF GPIB models)
- 8-bit display (24-bit true-color display *strongly* recommended)
- SCSI II cable adapter (with LS-3510AF SCSI models)

Minimum IBM PC and Compatibles Scanning System Requirements

- Microsoft Windows version 3.1 or later
- 8 Megabytes of RAM (more recommended)
- 80 Megabyte Hard Disk (300MB or more recommended)
- National Instruments GPIB-AT card (for ISA bus) or MC-GPIB card (for Microchannel bus) with cable (with LS-3510AF and LS-3500 GPIB models). The National Instruments GPIB-PCIIA card is *not* supported under Windows 3.1.
- SCSI controller card with ASPI driver (with LS-3510AF SCSI models)
- 8-bit display (24-bit true-color display *strongly* recommended)
- SCSI II cable adapter (with LS-3510AF SCSI models)

Suggested Macintosh System Configurations

Following these suggestions will yield the best scanning results:

- Set your disk cache (found in the “Memory” Control Panel in System 7, and in the General Control Panel in System 6) to the minimum setting, as scan times increase if the RAM cache is set above the minimum.
- Virtual Memory, also in the “Memory” Control Panel in System 7, should be switched off. Most imaging applications have their own method for dealing with images larger than available RAM.
- File Sharing should be switched off. Any extended background operation, such as copying large files from your system to another over a network, may cause the scanner to abort during a scan.
- Allocate at least 80% of your available memory to the application that is hosting the Nikon Scanner plug-in. Adding memory to your system is one of the best investments you can make to increase overall image processing performance.

- For the most accurate display, set your “Monitors” Control Panel to the maximum number of colors available. “Thousands” or “Millions” of colors will provide an excellent display of your image. If your system only supports a maximum of 256 colors you will see a ‘dithered’ image, which looks ‘soft’, and is difficult to adjust or edit accurately. The monitor setting has no effect on the actual quality of your image, which is always captured in 24-bit mode (16.7 million colors).
- Color images can occupy large amounts of disk space. Make sure your hard disk has sufficient free space to store the images you plan to scan. You should have at least 60 megabytes of free space available if you plan on maximum resolution scans.

Suggested IBM PC or Compatible System Configurations

- For the most accurate display, set your monitor to display the maximum number of colors available. 16-bit or 24-bit graphics adapters will provide an excellent rendition of your image. If your system only supports a maximum of 256 colors (VGA) you will see a ‘dithered’ image, which looks speckled or grainy. The monitor setting has no effect on the actual quality of your image, which is always captured in 24-bit mode (16.7 million colors).
- Color images can occupy large amounts of disk space. Make sure your hard disk has sufficient free space to store the images you plan to scan. You should have at least 60 megabytes of free space available if you plan on maximum resolution scans.

Before You Begin

Before proceeding, make a backup copy of your master diskettes! Store the master diskettes in a safe place. Always work with the backup copies to install the software.

In “Getting Started” you will learn the basics of how to perform a scan, thus getting you up and running within the shortest time possible. “Getting Started” provides condensed instruction that will lead you through your first scan, using the enclosed sample slide. Don’t worry if you do not understand some of the terminology and concepts introduced here. The goal is to familiarize yourself with the controls by performing a routine scan.

You will probably require about one half-hour to complete this trial run. In that time you will gain a working knowledge of the scanning system. Nikon scanners are designed to yield a high quality scan requiring little user intervention. You need only properly insert the film in the scanner, launch the scanning software, and select the SCAN command. However, if you would like a thorough explanation of the scanner controls, color imaging techniques, and color separation guidelines, we strongly recommend reading the entire contents of this manual.

Before you begin, make sure that you have the minimum system requirements for a functional scanning system. In particular, if you are using a GPIB model scanner, you must have a GPIB interface card and software installed in your computer, or have one ready to install.

For detailed information on the scanning hardware and a full discussion of programming your own scanner interface, refer to the *Technical and Programmer's References*, available from Nikon.

Now, let's begin by following the instructions in the "Software Installation" chapter for your particular computer.

Software Installation – Macintosh

Nikon Software

The enclosed distribution diskette *Scanning Software for Macintosh*, includes two scanning software programs, *Nikon Scanner plug-in* software and *Nikon Control*. Also included is a driver for the Nikon CP-3000 printer. Two software utilities, *NB Handler* and *Eject Coolsan Film* are included to assist you in configuring your GPIB computer interface (if applicable), and ejecting slides from Coolsan scanners, respectively.

Before you can use your scanner, you must install the scanning software on your computer. Because the scanning software files are compressed, you cannot simply copy them to your hard disk. Rather, by responding to a few simple prompts and providing a minimum amount of information, the *Nikon Installer*, also located on the distribution diskette, will automatically decompress and install the Nikon Scanner plug-in, Nikon Control, ColorSync profiles and Eject Coolsan Film (if applicable) onto your hard drive, as requested.



Commands that are taken from the user interface in this section are shown using HELVETICA type.

Nikon Scanner Plug-in Software

The Nikon Scanner plug-in software must be used in conjunction with another software application. It is called a *plug-in* because it ‘plugs in’ to any software application which is compatible with the Adobe Photoshop plug-in standard. The Nikon Scanner plug-in software user interface remains the same across most of the popular imaging applications. This allows you to scan from within different applications as desired, even crossing over from the Macintosh to the PC, without having to learn a new scanner software interface. Use of the Nikon Scanner plug-in is explained in detail later in this manual.

Nikon Control Software

Nikon Control is a stand-alone scanning software application that directly supports the Nikon Scanner plug-in for use with Nikon scanners only. If you would rather not scan from within another application program, such as Photoshop, Nikon Control is an easy-to-use application. Use of Nikon Control is explained in detail later in this manual.

Utility Software

The distribution diskette also contains two software utilities. The first, NB Handler, is used to communicate with the GPIB interface card for use with Nikon LS-3510AF scanners or CP-3000 printers with a GPIB interface. Eject Coolscan Film is a simple software application for ejecting the slide inserted in Coolscan scanners only. This application has no menu. It will locate Coolscan, send the EJECT FILM command, then quit.

System Requirements

Macintosh System 6.0.5 (System 7.1 is recommended) must be installed on the computer before attempting to run the Nikon Installer software. The destination disk drive, the drive on which you will be loading the scanning software, must have enough disk space to accommodate the Nikon Scanner plug-in and Nikon Control. If you are planning on using the plug-in with specific third-party applications, make sure that the application is already installed on the destination drive before installing the plug-in.

About the Nikon Installer

The Distribution Diskette

Insert the *backup copy* of the distribution diskette into an available floppy disk drive. The disk should open automatically to the top-left corner of the screen, revealing its contents, shown in Figure 2.1.

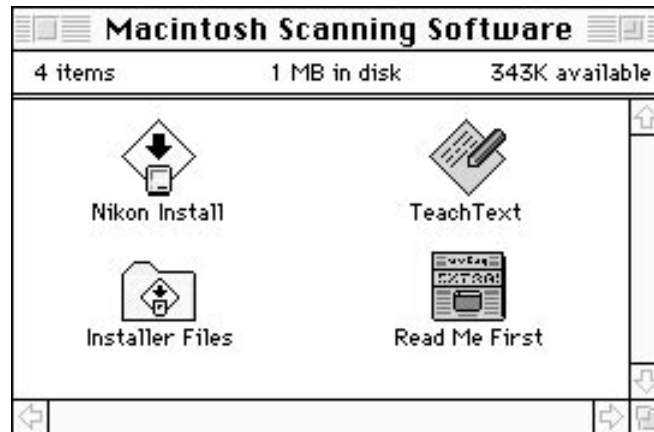


Figure 2.1 Contents of the distribution diskette.

Make sure to read contents of the *Read Me First* file for important technical information before proceeding.

Before You Begin

The Nikon Installer program provides two installation options. The first option, *Easy Install*, installs all necessary files for your LS-3510AF with GPIB interface. This can only be installed to a disk with a working System Folder. The second set of options, *Customize*, allows you to specify installation of software for other Nikon products. Both options allow you to quit during the installation if desired.

There are times when you will already have another imaging application loaded onto your Macintosh and would like to use the Nikon Scanner plug-in in conjunction with it. For example, you might be using Nikon ImageAccess or Adobe Photoshop. If you already have one of these applications loaded onto your computer, all that is required is to run the Nikon Installer, then copy the Nikon Scanner plug-in from the NIKON CONTROL folder to the desired folder. The Nikon Scanner plug-in can then be automatically accessed by your existing imaging software.



The LS-3510AF/LS-3500 GPIB software must be installed to a system disk. The Nikon Installer will not allow installation of the GPIB Drivers to a non-system disk.



It is strongly recommended that you disable all virus protection software before using the Nikon Installer. Some virus protection software may be triggered by the Nikon Installer.

Running the Nikon Installer

Step 1. Double-click the NIKON INSTALL icon with the mouse button.

The Installer will display an introductory screen.

Step 2. Click the OK button.

Step 3. The following message will appear:



Figure 2.2 The installation message for suggested system configuration.

It is strongly recommended that you adhere to the recommended system configuration to optimize performance of your Nikon scanner.

Click the CONTINUE button.

Step 4. The Nikon Installer dialog box, seen in Figure 2.3, will appear, and your Startup disk will be selected for the installation.



Figure 2.3 The Nikon Installer dialog for selecting Easy Install of LS-3510AF GPIB model. Click CUSTOMIZE for installation for other Nikon devices.

If you are installing a Nikon LS-3510AF or LS-3500 *GPiB* model scanner, click the **INSTALL** button and proceed to Step 7.

–or–

If you are installing a Nikon Coolscan scanner, an LS-3510AF *SCSI* model scanner, or a Nikon CP-3000 Dye Sublimation Printer, click **CUSTOMIZE**, and proceed to Step 5.

Step 5. A dialog box containing the three installation options will appear, as seen in Figure 2.4. Select the option you want to install by clicking on it.

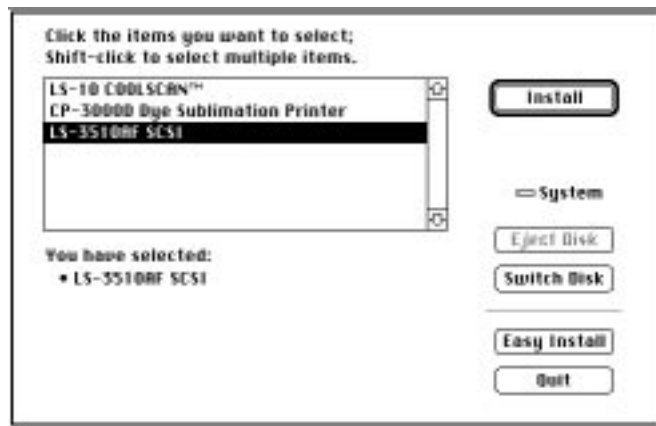


Figure 2.4 The Nikon Installer dialog for selecting other Nikon devices for installation.

Step 6. Once you have selected the device for installation, click the **INSTALL** button, *not* to be confused with the **EASY INSTALL**, button which returns you to the first dialog.

–or–

If you want to install the LS-3500/LS-3510AF *GPiB* model, click the **EASY INSTALL** button.

Step 7. The dialog box shown in Figure 2.5 will appear, indicating the progress of the installation. You will see the names of the files being installed adjacent to **EXTRACTING:** as they are first copied then extracted to your hard disk, as well as the number of **FILES REMAINING TO BE EXTRACTED:** just below. This extraction process will take a few minutes to complete. Note that you can quit the installation at any time by clicking the **STOP** button. Your system will automatically be restarted at the end of the installation, so that the necessary driver software will load.

If you selected the Easy Install option in Step 4, all files necessary for operating a Nikon LS-3510AF GPIB model scanner will be copied and extracted to your hard disk. A folder named Nikon Control will be created on the hard disk, in this example on the hard disk “System.” The NB-Handler software will be installed in the Control Panels folder in your System Folder if you are using System 7. Your system will automatically be restarted at the end of the installation, so that the GPIB drivers will load.

If you selected a Nikon device other than the LS-3510AF GPIB model for installation, as in Step 5, all relevant files will be copied and extracted to your hard disk.

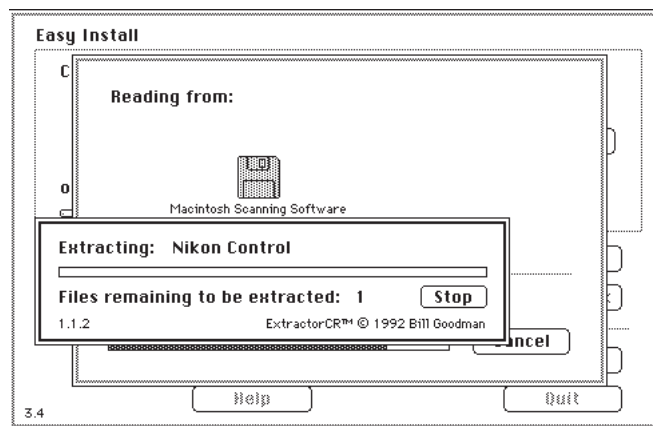


Figure 2.5 The Nikon Installer progress indicator.

Step 8. In most cases, a message will be displayed informing you that the installation was completed successfully. Be sure to make note of any error messages that appear, before contacting Nikon Technical Support. Some virus detection software may be triggered by the Nikon Installer. You should disable them before using the Nikon Installer.

If you are installing a Nikon LS-3510AF with a SCSI interface, using the built-in SCSI interface on the Macintosh, connect the DB25 to SCSI II cable adapter to the rear panel connector on the Macintosh, then to the Mini 50-pin connector on the LS-3510AF. If this is the only device on the SCSI bus, connect a terminator to the second plug on the Nikon device. Restart your Macintosh and proceed to the chapter “Getting Started on the Macintosh.”

Software Installation – IBM PC or Compatible

Nikon Software

The enclosed distribution diskette *Scanning Software for Windows*, includes two scanning software programs, *Nikon Scanner plug-in* software and *Nikon Control*. Also included is a driver for the Nikon CP-3000 Dye Sublimation Printer. The software utility *Eject Coolscan Film* is included to assist you in ejecting a slide from Coolscan scanners within the Program Manager, Windows' File Manager, or DOS.

Nikon Scanner Plug-in Software

The Nikon Scanner plug-in software must be used in conjunction with another software application. It is called a *plug-in* because it 'plugs in' to a number of software applications such as Nikon Image*Access*, Micrografx Picture Publisher and Adobe Photoshop/PC. The Nikon Scanner plug-in software user interface remains the same across these and most other popular imaging applications. This allows you to scan from within different applications as desired, even crossing over from the PC to the Macintosh, without having to learn a new scanner software interface. Use of the Nikon Scanner plug-in is explained in detail later in this manual.

Nikon Control Software

Nikon Control is a stand-alone scanning software application that directly supports the Nikon Scanner plug-in for use with Nikon scanners only. If you would rather not scan from within another application program, such as Photoshop, Nikon Control is an easy-to-use application. Use of Nikon Control is explained in detail later in this manual.

Utility Software

The distribution diskette also contains the software utility Eject Coolscan Film, a simple software application for ejecting the slide inserted in Coolscan scanners only. This application has no menu. It will locate Coolscan, send the EJECT FILM command, then quit.

Nikon Installer Software

By responding to a few simple prompts and providing a minimum amount of information, the *Nikon Installer* will automatically install the Nikon Scanner plug-in and/or the Nikon Control software onto your hard drive, as requested.



Commands that are taken from the user interface in this section are shown using HELVETICA type.

System Requirements

Windows 3.1 or later must be installed on the computer before attempting to run the Nikon Installer software. The destination disk drive, the drive on which you will be loading the scanning software, must have enough disk space to accommodate the Nikon Scanner plug-in and/or Nikon Control, and the SCSI driver. If you are planning on using the Nikon Scanner plug-in with specific third-party applications, you should have all the required disks available before continuing.

The Distribution Diskette

The Nikon software distribution diskette contains the Nikon Control application, the ASPI driver required by the SCSI controller card, and the main installation program called SETUP.EXE. The SETUP.EXE program will install Nikon Control and/or a number of third-party applications you may already own. *Make sure to make a backup copy of the Nikon distribution diskette before continuing.*

Running the Nikon Installer

First, insert the backup copy of the distribution diskette into an available 3-1/2 inch floppy disk drive. Please contact Nikon Technical Support at 516-547-4311 if you require 5-1/4 inch media.

The Nikon Installer software must be run from Windows. In the Windows Program Manager click the mouse on the FILE menu item, as shown in Figure 3.1.

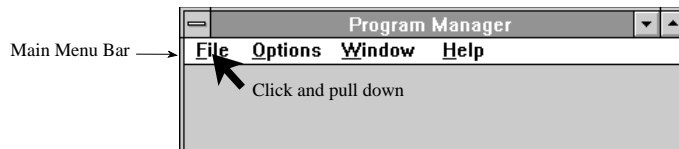


Figure 3.1 The Windows Program Manager.

The FILE drop-down menu will appear, as shown in Figure 3.2. Drag the mouse down to the RUN item and release the mouse button.

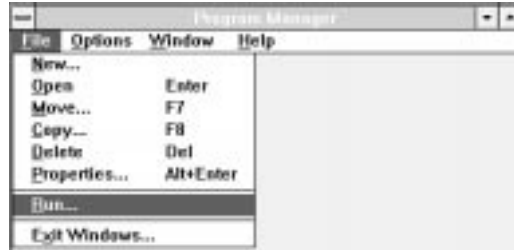


Figure 3.2 The FILE menu.

At this time the RUN dialog will be displayed, prompting you to enter the path to the Nikon Installer. The Nikon Installer program is named `SETUP.EXE`. If the Nikon distribution diskette is in the 'A' drive, enter `A:\SETUP.EXE` into the file name dialog, then click the OK button. This is illustrated in Figure 3.3.



Figure 3.3 Windows' RUN dialog.

You will be prompted to answer a series of basic questions, after which the Nikon Installer will automatically install the designated scanning software.

You can access help at any stage of the installation by clicking on the HELP button. Similarly, you can exit the Nikon Installer at any time by clicking on the EXIT button.

To complete the software installation, simply select from the options available in each dialog, which are explained fully in the following sections.

The Software Installer Dialog

The first dialog that appears after you launch the `SETUP.EXE` program is the NIKON SCANNER SOFTWARE SETUP dialog, seen in Figure 3.4. The Installer is decompressing the scanner software files on the floppy disk and copying them to a temporary file on your hard disk. This will take a few moments to complete.



Figure 3.4 The NIKON SCANNER SOFTWARE SETUP dialog.

At the conclusion of the setup operation, the NIKON SCANNER SOFTWARE INSTALLER dialog will appear, as shown in Figure 3.5.

If you want to continue with the installation, click the CONTINUE button. If you don't want to continue with the installation, click the EXIT button. Clicking the HELP button will provide you with basic information about the current step in the installation procedure.



Figure 3.5 The NIKON SCANNER SOFTWARE INSTALLER dialog.

The Product Selection Dialog

The PRODUCT SELECTION dialog, seen in Figure 3.6, is used to indicate which Nikon product is being installed. Select the appropriate button, then click on the CONTINUE button to proceed.



Figure 3.6 The PRODUCT SELECTION dialog.

The Installation Options Dialog

The next step entails selecting the application software which you want to 'host,' or control the Nikon Scanner plug-in software. Use of the Nikon Scanner plug-in requires a host application.

Select the host application through the INSTALLATION OPTIONS dialog, shown in Figure 3.7. The function of this dialog is to tell the Nikon Installer which application you will be using to access the scanner.

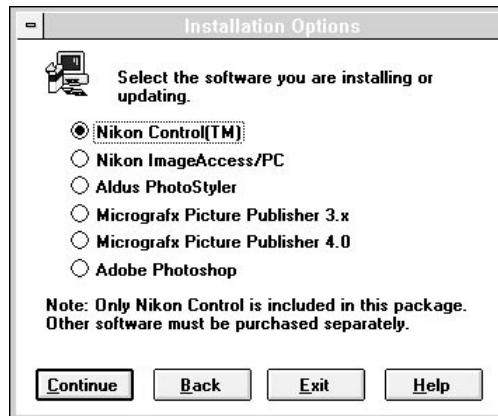


Figure 3.7 The INSTALLATION OPTIONS dialog.

The default selection is Nikon Control. If you select any of the other listed software products, refer to the section “Installing Third-Party Applications” in this chapter.

The Path Selection for Files Dialog

The Installer software must be informed as to where you want the scanning software installed. This is accomplished by entering the ‘logical disk’ and path into the PATH SELECTION FOR FILES dialog, as shown in Figure 3.8, then clicking CONTINUE. The default path for Nikon Control is C:\NIKON.



Figure 3.8 The PATH SELECTION FOR FILES dialog.

If you want to install the Nikon Control software as the host application, click CONTINUE. This will invoke the SCSI DEVICE DRIVER OPTIONS dialog, as seen in Figure 3.9.

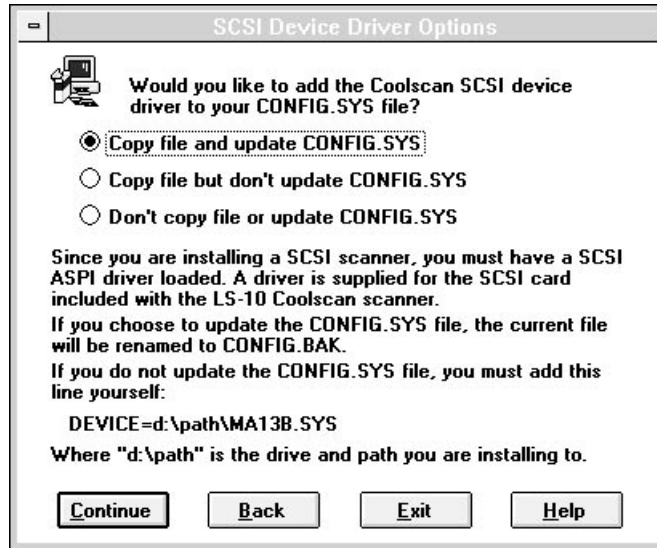


Figure 3.9 The SCSI DEVICE DRIVER OPTIONS dialog.

When using the scanner with the included SCSI controller card, select the COPY FILE AND UPDATE CONFIG.SYS selection. Expert level users, who are familiar with the structure of the Config.SYS file, may choose one of the other options.



Improperly editing the CONFIG.SYS file may cause your system to operate improperly or fail to boot. Always make a backup copy of the CONFIG.SYS file before editing it.

After you click on CONTINUE, each file is copied to your hard disk. The NIKON SETUP Progress Indicator, seen in Figure 3.10, will report the percentage of the installation completed.

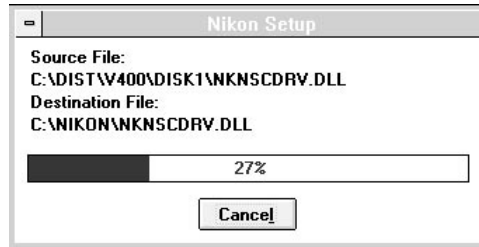


Figure 3.10 The NIKON SETUP Progress Indicator.

At the conclusion of the Nikon Control installation you will be prompted to create a PROGRAM MANAGER GROUP FOR NIKON CONTROL, as seen in Figure 3.11. The Program Manager group allows you to quickly launch application software by double-clicking on an icon, instead of typing a path in the RUN dialog in the Program Manager, or having to locate the program in the Windows File Manager.



Figure 3.11 The NIKON SETUP dialog.

After you create the Program Manager group you will see the REBOOT SYSTEM dialog. You must reboot your system in order to load the driver software and use your Nikon scanner.

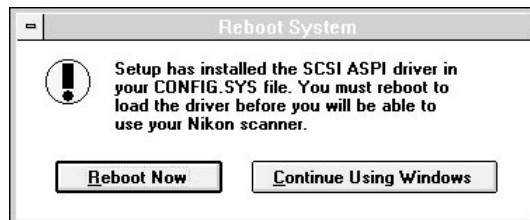


Figure 3.12 The REBOOT SYSTEM dialog.

Congratulations! You have successfully installed the Nikon Control software. If you wish to install the Nikon Scanner plug-in software for use with a third party application, please proceed to the next section.

Installing Third-Party Applications

The Path Selection for Installer Dialog

If you are using one of the listed third-party software applications in the INSTALLER OPTIONS dialog, the Nikon Installer needs to know where you want the Nikon plug-in software to reside. This is accomplished by entering the destination disk and path into the PATH SELECTION FOR INSTALLER dialog, shown in Figure 3.13. The Nikon Installer will do its best to anticipate where you want the files to go, based on your host application selection. This path information will automatically appear in the PATH text box. If this path is correct, click on CONTINUE. If it is incorrect, correct the path entry, then click on CONTINUE.

If necessary, you can revert to the PATH SELECTION FOR INSTALLER dialog by clicking on BACK.

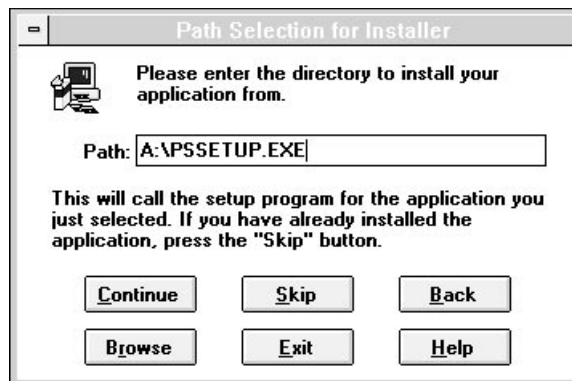


Figure 3.13 The PATH SELECTION FOR INSTALLER dialog.

The Installation Method Dialog

At this time, you need to inform the Nikon Installer whether you will be installing new host application software and the plug-in onto the destination disk, or updating an already installed host application and only loading the plug-in onto the destination disk. This is accomplished via the INSTALLATION METHOD dialog, shown in Figure 3.14.

If you are installing new host application software, click the NEW INSTALLATION radio button, then click CONTINUE. If you are updating a previously installed host application, click the UPDATING A CURRENT INSTALLATION radio button, then click on CONTINUE.



Figure 3.14 The INSTALLATION METHOD dialog.

If you are installing new host application software, you will be required to supply the path of its installation software. At this time, you should insert your host application distribution disks, if they aren't already loaded, into the appropriate floppy drive and follow the third-party vendor's installation instructions. The path of the host application installation software is entered through the PATH SELECTION FOR INSTALLER dialog, shown in Figure 3.13.

Upon completion of the third-party application software installation, you will be required to enter the destination path for the Nikon Scanner plug-in. This is accomplished by entering the path into the PATH SELECTION FOR FILES dialog, as seen in Figure 3.8, then clicking CONTINUE.

If you are only updating previously installed application software, the same requirement applies, i.e. enter the destination path for the Nikon Scanner plug-in. Again, this is accomplished by entering the path into the PATH SELECTION FOR FILES dialog, as seen in Figure 3.8, then clicking CONTINUE.

Configuring and Testing the GPIB

If you are installing a Nikon LS-3510AF GPIB model, the National Instruments AT-GPIB and MC-GPIB are supported. When installing the software drivers for these boards, be sure to select the installation for Windows. National Instruments can be reached directly at 1-800-IEEE-488 (1-800-433-3488).

Installing the SCSI Driver Software

The Nikon LS-3510AF SCSI model and all Coolscan models are interfaced to the computer through the SCSI bus. It is necessary to load the *SCSI driver* software into the computer's memory in order to access the scanner. This is typically accomplished by adding a `DEVICE` statement in the computer's `CONFIG.SYS` file.

The Nikon Installer can automatically update the current `CONFIG.SYS` file for you via the `SCSI DEVICE DRIVER OPTIONS` dialog, seen in Figure 3.9. This is the recommended procedure for novice users.

The dialog contains three options. The first is `COPY FILE AND UPDATE CONFIG.SYS`. If you select this option and click `CONTINUE`, the scanner SCSI device driver will be added to your current `CONFIG.SYS` file, which will then be renamed `CONFIG.BAK`. The following line will automatically be entered into the `CONFIG.SYS` file:

```
DEVICE=C:\PATH\MA13B.SYS
```

Alternatively, you can modify the `CONFIG.SYS` file yourself. In this case, select the `COPY FILE BUT DON'T UPDATE CONFIG.SYS` radio button, then click `CONTINUE`. If you select this option, you must manually enter the following line into your `CONFIG.SYS` file:

```
DEVICE=C:\PATH\MA13B.SYS
```

The last option in this dialog, `DON'T COPY FILE OR UPDATE CONFIG.SYS` should only be selected when you do not want to complete this operation.

If you are attempting to use the scanner with a third-party SCSI controller card you should consider the advantages of running your scanner and hard disk from isolated buses. There are a wide variety of SCSI controller cards on the market, but not every card can supply the SCSI functionality required to run your scanner. The required ASPI driver software is often an additional cost. The Trantor T-130 SCSI controller card and ASPI software have been certified by Nikon for use with your scanner. For microchannel use, the Trantor T-260 has been certified by Nikon. Only select `COPY FILE AND UPDATE CONFIG.SYS` if you are using the Trantor T-130 SCSI controller card.

Getting Started on the Macintosh

Launching the Nikon Scanner

To access your Nikon Scanner plug-in you must first launch your imaging application, such as Photoshop, shown in Figure 4.1.



Figure 4.1 Launching the imaging application.

A menu bar associated with the Photoshop application will appear at the top of the screen. It will look similar to the one shown in Figure 4.2.



Figure 4.2 The Photoshop Main menu.

Click on the FILE portion of the Main menu. Notice the file pull-down menu looks similar to the following illustration. Without releasing the mouse button, pull down until the ACQUIRE item is highlighted, as shown in Figure 4.3.

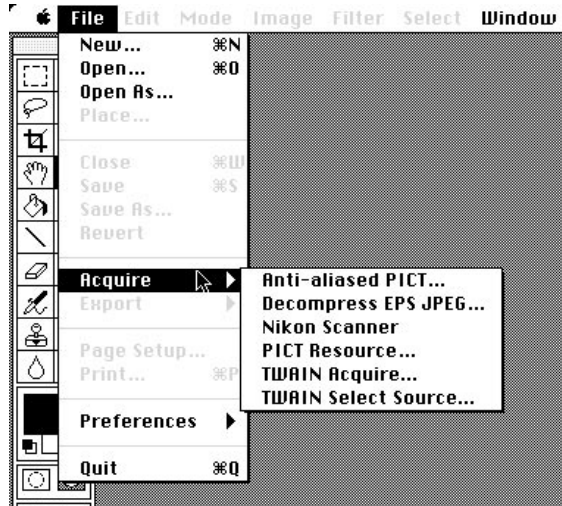


Figure 4.3 Selecting ACQUIRE from the Photoshop FILE pull-down menu.

Next, drag the mouse to the right, following the arrow to the right of the ACQUIRE item. This will bring up the NIKON SCANNER item, as shown in Figure 4.4. Highlight this box and release the mouse button. This will initialize the plug-in's Main Scan dialog box.

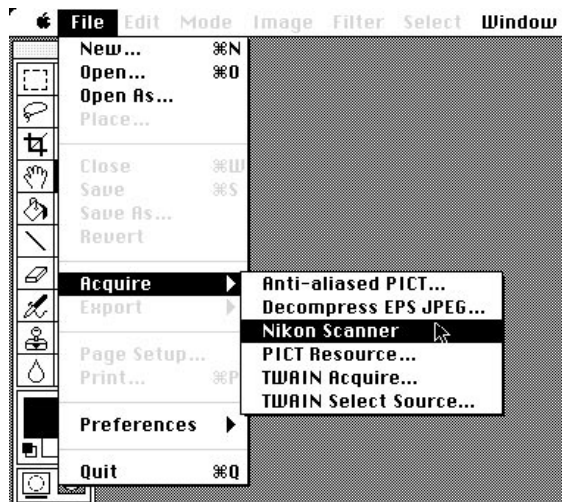


Figure 4.4 Selecting the NIKON SCANNER menu item.

Plug-in Initialization

The plug-in will first set up the software environment and display the following message.



The plug-in will next search the SCSI for SCSI model scanners, or the GPIB bus for GPIB model scanners to ensure that your scanner is installed and functional. While it is searching, the following message will appear for SCSI model scanners:



Or for GPIB model scanners, the following message will appear:



Once the plug-in opens the functional SCSI or GPIB scanner, you will be able to commence scanning.

The Scan Dialogs

The Nikon Scanner plug-in's main scanning dialog box is called the Main Scan dialog. There are three sizes of this scan dialog, designed to best accommodate the wide variety of available monitor sizes. Macintosh PowerBooks are supported with appropriate artwork, depending on the available display. These three different sized dialog boxes offer similar functionality, with the dialog box for large screens offering a substantially larger preview, making such operations as color correction and cropping easier and more precise.

The scan dialog shown in Figure 4.5 is the dialog used for monitors that have resolutions of 832 x 624 pixels or larger, including 16" through 21" screens.



Figure 4.5 The Nikon Scanner plug-in's Main Scan dialog for monitors that have resolutions of 832 x 624 pixels or greater (Coolscan connected).

The scan dialog shown in Figure 4.6 is the default dialog size for monitors with resolutions that are *less* than 832 x 624 pixels, that include 9" through 14" screens.



Note that using the larger dialog results in longer preview times. This can be changed in the Tools dialog, explained later in this chapter.



Figure 4.6 The Nikon Scanner plug-in's Main Scan dialog for monitors that display less than 832 x 624 pixels (Coolscan connected).

Most scanning operations can be performed from this dialog box, including selecting the film type, previewing the image, fine focusing, cropping the image, and performing basic brightness, contrast and color balance tasks.

If the message box in the upper left-hand corner contains NIKON COOLSCAN VER.

1.0.2 (for Coolscan users), or NIKON LS-3510AF VER. 1.34 (for LS-3510AF users), you are ready to perform a preview scan or a final scan. Please note that engineering changes may mean that your software version, which was the shipping version at the time of this printing, will not be the same. If no scanner type is indicated, the message NO SCANNER CONNECTED will appear. In this case, the scanner may not have been in a ready state (indicated by a steady green LED on the front panel) when you started the Nikon Scanner plug-in software. You can establish a connection to the scanner by clicking on the relevant search icon, SCSI or GPIB, which is located at the top of the Main Scan dialog. You will need to check your installation, particularly the SCSI or GPIB cabling to confirm proper connections and termination if this attempt fails. For scanner installations with other SCSI or GPIB external devices, place the scanner in the SCSI or GPIB chain, remembering to maintain proper termination. If you are unsure of which SCSI or GPIB address to use, consult the Installation Guide included with your scanner.

Inserting the Slide

Take out the included sample 35mm slide. You will be using this slide to perform your first preview scan and final scan.

The two sides of the film in the slide mount are not the same. One side is known as the *emulsion* side, and contains the image dye layers. The other side is known as the *base*, and consists of the celluloid film support. We will explain the significance of the emulsion side of the film, and how to identify it in a later chapter. For the purpose of this introduction we have predetermined the emulsion side for you. The emulsion side does *not* have the “Nikon Electronic Imaging” logo printed on the slide mount.

As you have probably already noticed, the slide mount is square, and can be inserted in the scanner in any orientation. However, the orientation of the slide when it is inserted into the scanner *does* affect the scanning process. This will be addressed in depth in a later chapter.

Coolscan

The slide is inserted into Coolscan in much the same way as a floppy diskette is inserted into a disk drive, as shown in Figure 4.7. For optimum scanning, the emulsion side should face the top of the scanner, as shown in Figure 4.7. Insert the slide into the slot in the front of the scanner, making sure that the “Nikon Electronic Imaging” logo faces down, and that the side of the slide corresponding to the top of the head of the person seen in the picture enters the scanner facing the *left* side of the film slot. Gently push the slide in as far as it will go, *without forcing it*. The carriage mechanism inside the scanner will take care of the rest.

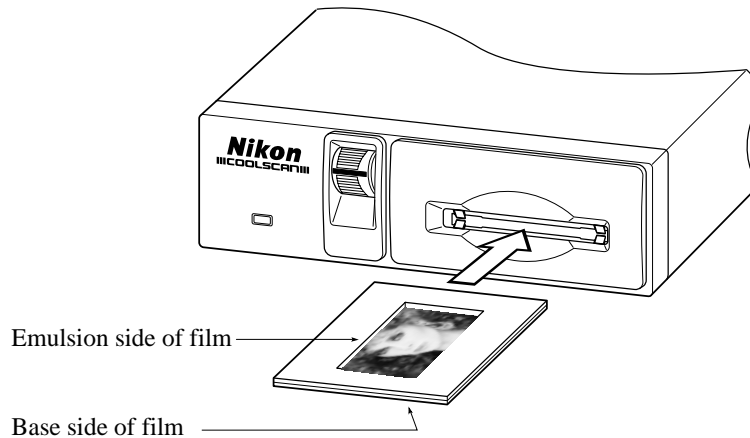


Figure 4.7 Inserting the emulsion side of the film facing the top of Coolscan.

LS-3510AF

You will be using the Standard Slide Holder for this scan. Hold the mount as in the diagram in Figure 4.8. Insert the slide so that the emulsion side of the film faces the back of the scanner, and the picture is rightside-up. Since the LS-3510AF is an autofocus scanner, it will not make much difference which way you place the emulsion (other than image orientation, right-reading or backwards), although sharpest results will be achieved when the emulsion faces the front of the scanner. This is because the imaging lens will not be reading the film through the film base, which may reduce definition, depending on the film type.

Insert the Slide Holder into the scanner so that the slide mount is closest to the lamp. Close the dustproof cover so that the outside light does not affect the scan.

The sample slide is a landscape, or a horizontal image. Therefore we can leave the default scanning orientation in the landscape position.

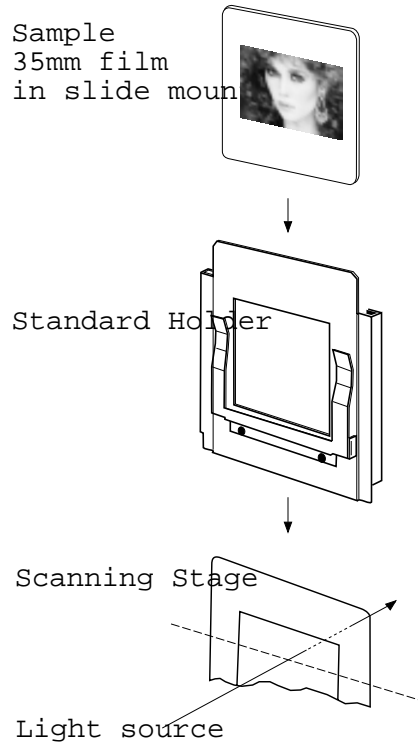


Figure 4.8 Loading the slide into the LS-3510AF.

Scanning a Preview Image

The purpose of the preview scan is to rapidly display the image from the slide on your computer screen. Once the image is scanned and on the screen, you can then perform more detailed operations which will affect how the image will be captured in the final high resolution scan. A sampling of such operations might include cropping a particular portion of the image, or adjusting the contrast, brightness and color balance. The results of these operations will be displayed on the screen. For now, though, we will scan the sample slide using the plug-in's default settings.

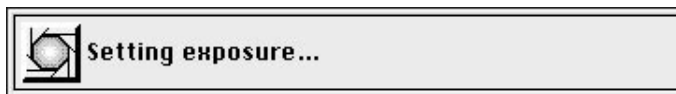


For Coolsan users: Before proceeding, make sure that the center line of the focus wheel on the front panel of the scanner is in the centered position. If not, set this position by rotating the wheel with your thumb.

So, go ahead and click the PREVIEW button.

Preview

In order to obtain the best scan, Coolscan and the LS-3510AF first perform an *autoexposure* sequence to determine certain image characteristics. This will be indicated on screen by the dialog shown below, and followed by additional messages as required. The LS-3510AF will also perform an autofocus sequence, accompanied by the message PERFORMING AUTOFOCUS. Coolscan users should then see the green LED on the scanner's front panel blink on and off slowly as the scanner is acquiring the image, while LS-3510AF users should see the green BUSY LED illuminated. We can now see the image as it is displayed, line by line, in the preview window.



Should you discover that you have inserted the slide in the wrong orientation, you can abort the scan by pressing the Command “⌘” and period “.” keys simultaneously. Coolscan users can then eject the slide by clicking on the EJECT button in the bottom-right corner of the Scan dialog box. *Do not* click the EJECT button during a scan. Always abort the scan first.

Eject

The preview scan should take a little less than one minute to complete, with slight variations in speed depending on the model of your Macintosh and the size of your display. Upon completion, the preview image will stay in the Scan dialog box while you prepare for the final scan.

Final Scan

The next step is to perform the final scan at a higher resolution, or image quality. First, we have to crop, or trim the preview image. Notice there is a narrow black border around it. We want to eliminate this from the scanning area so that it does not appear in our final scan.

Setting the Crop

Start by placing the cursor anywhere over the preview, clicking and dragging a *crop rectangle* to enclose the area of interest. Adjust the crop rectangle by placing the cursor on any of the small boxes, or ‘hot spots,’ on the crop rectangle. The cursor will change to an arrow when it is placed over any of these boxes. Now, move the rectangle inward by clicking and dragging until the border line of the rectangle encloses the area

of interest, as in Figure 4.9a for Coolscan, and Figure 4.9b for LS-3510AF. Repeat this step using the other small boxes, as necessary, until you have cropped the image to its edges, and the unexposed, or black area is completely outside of the rectangle.

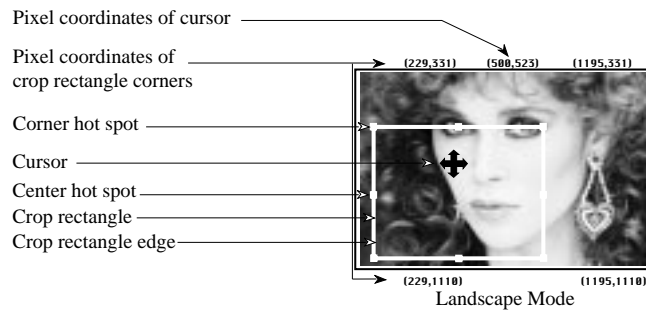


Figure 4.9a Selecting a crop area – Coolscan.

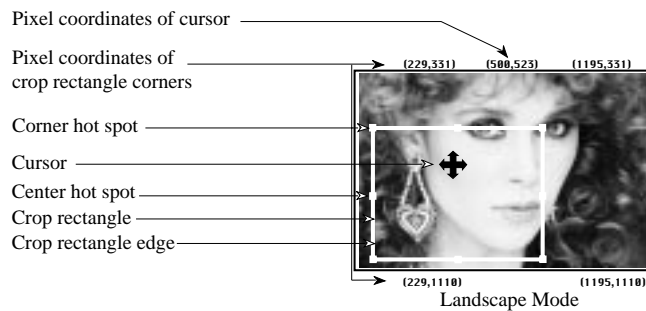


Figure 4.9b Selecting a crop area – LS-3510AF.

The dimensions, resolution, and pitch setting in the preview window can be left at the default setting of 9 x 6 inches, 72 pixels/inch, and 6, respectively.

You are now ready to make the final scan. Click on the **SCAN** button, shown in Figure 4.10, at the lower-right corner of the Main Scan dialog box. The scanner will begin the scanning cycle. Again, the **SETTING UP THE SCANNER** dialog will appear on your screen. This will be followed immediately by the *scanning progress indicator*, which shows the approximate duration of the scan and the portion remaining to be completed. Coolscan users should also see the green LED on the scanner's front panel blink on and off as the scan proceeds, while LS-3510AF users should see the green **BUSY** LED illuminated. The final scan should take approximately two minutes to complete, with slight variation in speed depending on the model of your Macintosh and the size of your display.

Scan

Figure 4.10 Start your final scan by clicking the SCAN button.

Unlike the preview scan, the image will not display on the screen as the scan progresses. Instead, you will see the scanning progress indicator. The final scan will appear upon completion in a new window labeled “UNTITLED-1.” You will want to save the file with an appropriate name, so it will be easy to locate later on. You can save the image in the normal manner, using the SAVE AS... command located under the FILE pull down menu, as shown in Figure 4.11, or close the window and begin again.

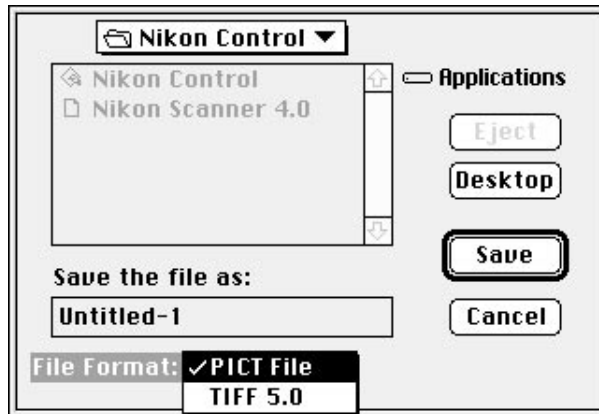


Figure 4.11 The SAVE AS... dialog box.



You will not be able to see the high-quality color produced by the scanner unless your computer is configured with a 24-bit display card. Using an 8-bit card will display a dithered, or softened image, comprised of many small dots. Select “Thousands” or “Millions” of colors from your Monitors control panel for the best display.

Conclusion

Congratulations! You have completed “Getting Started!” Feel free to continue exploring on your own. However, to take advantage of the full functionality of the scanner we strongly recommend reading the following chapters. In them, you will learn the fundamentals of scanning, managing different film types, adjusting color, contrast, and brightness, and utilizing the software controls.

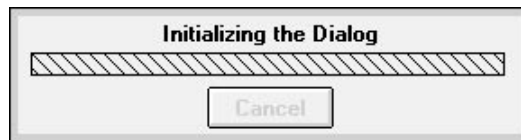
Getting Started on the IBM PC or Compatible

Launching the Software

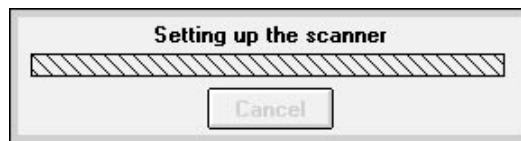
Before launching the scanning software make sure that your scanner is powered on. Power on is indicated by a solid green illuminated LED on the scanner's front panel.

If you are using a third-party imaging application you will need to access the Nikon Scanner plug-in from the FILE menu. If you are using the Nikon Control software, the dialog will appear automatically.

If you are using a third-party imaging application, pull down the FILE menu to access the appropriate menu item used by that application for scanning input. Then, select NIKON SCANNER... from the submenu. Once launched you should see the following messages appear on your screen.



After a moment, the following message will appear:



The Nikon Scanner plug-in is now attempting to establish connection with the scanner.

The Main Scan dialog will then appear.



Figure 5.1 The Nikon Scanner plug-in's Main Scan dialog for monitors with resolutions of 640 x 480 pixels (Coolscan connected).

For Nikon scanners with a SCSI interface, the Nikon Scanner plug-in and the Nikon Control software assume that the scanner is configured for SCSI ID #5. This is the factory default condition. If this is not the case, consult the Installation Guide accompanying your scanner for proper configuration instructions.

Most scanning operations can be performed from this dialog box, including selecting the film type, previewing the image, fine focusing, cropping the image, and performing basic brightness, contrast and color balance tasks.

If the message box in the upper left-hand corner contains NIKON COOLSCAN VER. 1.0.2 (for Coolscan users), or NIKON LS-3510AF VER. 1.30 (for LS-3510AF users), you are ready to perform a preview scan or a final scan. Please note that engineering changes may mean that your ROM version, which was the shipping version at the time of this printing, will not be the same. If no scanner type is indicated, the message NO SCANNER CONNECTED will appear. In this case, the scanner may not have been in a ready state (indicated by a steady green LED on the front panel) when you started the Nikon Scanner plug-in software. You can establish a connection to the scanner by clicking on the relevant search icon, SCSI or GPIB, which is located at the top of the Main Scan dialog. You will need to check your installation, particularly the SCSI or GPIB cabling to confirm proper connections and termination if this attempt fails. For scanner installations with other SCSI or GPIB external devices, place the scanner in the SCSI or GPIB chain, remembering to maintain proper termination. If you are unsure of which SCSI or GPIB address to use, consult the Installation Guide included with your scanner.

Inserting the Slide

Take out the included sample 35mm slide. You will be using this slide to perform your first preview scan and final scan.

The two sides of the film in the slide mount are not the same. One side is known as the *emulsion* side, and contains the image dye layers. The other side is known as the *base*, and consists of the celluloid film support. We will explain the significance of the emulsion side of the film, and how to identify it in a later chapter. For the purpose of this introduction we have predetermined the emulsion side for you. The emulsion side does *not* have the “Nikon Electronic Imaging” logo printed on the slide mount.

As you have probably already noticed, the slide mount is square, and can be inserted in the scanner in any orientation. However, the orientation of the slide when it is inserted into the scanner *does* affect the scanning process. This will be addressed in depth in a later chapter.

Coolscan

The slide is inserted into Coolscan in much the same way as a floppy diskette is inserted into a disk drive, as shown in Figure 5.2. For optimum scanning, the emulsion side should face the top of the scanner, as shown in Figure 5.2. Insert the slide into the slot in the front of the scanner, making sure that the “Nikon Electronic Imaging” logo faces down, and that the side of the slide corresponding to the top of the head of the person seen in the picture enters the scanner facing the *left* side of the film slot. Gently push the slide in as far as it will go, *without forcing it*. The carriage mechanism inside the scanner will take care of the rest.

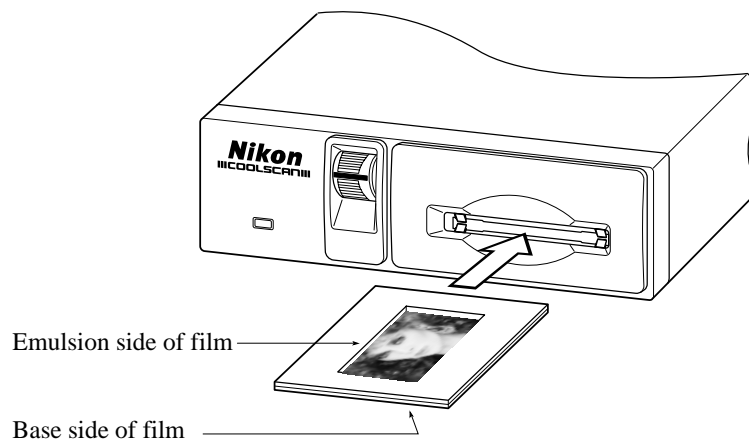


Figure 5.2 Inserting the emulsion side of the film facing the top of Coolscan.

LS-3510AF

You will be using the Standard Slide Holder for this scan. Hold the mount as in the diagram in Figure 5.3 below. Insert the slide so that the emulsion side of the film faces the back of the scanner, and the picture is rightside-up. Since the LS-3510AF is an autofocus scanner, it will not make much difference which way you place the emulsion (other than image orientation, right-reading or backwards), although sharpest results will be achieved when the emulsion faces the back of the scanner. This is because the imaging lens will not be reading the film through the film base, which may reduce definition, depending on the film type.

Insert the Slide Holder into the scanner so that the slide mount is closest to the lamp. Close the dustproof cover so that the outside light does not affect the scan.

The sample slide is a landscape, or a horizontal image. Therefore we can leave the default scanning orientation in the landscape position.

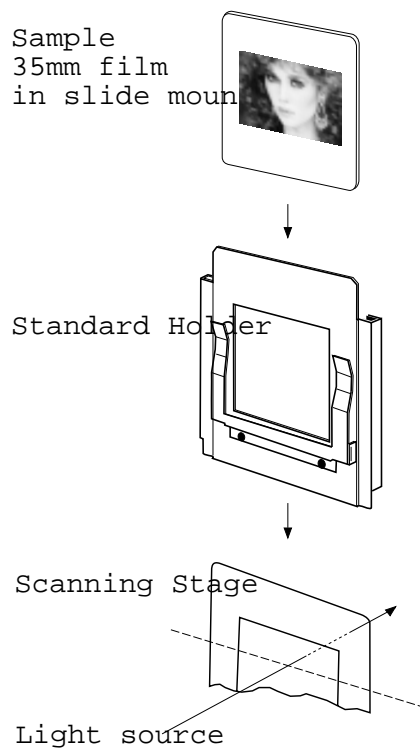


Figure 5.3 Loading the slide into the LS-3510AF.

Scanning a Preview Image

The purpose of the preview scan is to rapidly display the image on the slide on your computer screen. Once the image is scanned and on the screen, you can then perform more detailed operations which will affect how the image will be captured in the final high resolution scan. A sampling of such operations might include cropping a particular portion of the image, or adjusting the contrast, brightness and color balance. The results of these operations will be displayed on the screen. For now, though, we will scan the sample slide using the scanner's default settings.



For Coolscan users: Before proceeding, make sure that the center line of the focus wheel on the front panel of the scanner is in the centered position. If not, set this position by rotating the wheel with your thumb.

So, go ahead and click the PREVIEW button.

Preview

In order to obtain the best scan, Coolscan and the LS-3510AF first perform an *autoexposure* sequence to determine certain image characteristics. This will be indicated on screen by the dialog shown below, and followed by additional messages as required. The LS-3510AF will also perform an autofocus sequence, accompanied by the message PERFORMING AUTOFOCUS. Coolscan users should then see the green LED on the scanner's front panel blink on and off slowly as the scanner is acquiring the image, while LS-3510AF users should see the green BUSY LED illuminated.



Should you discover that you have inserted the slide in the wrong orientation, you can abort the scan by pressing the Escape key. Coolscan users can then eject the slide by clicking on the EJECT SLIDE button in the bottom-right corner of the Scan dialog box. **Do not click the EJECT SLIDE button during a scan. Always abort the scan first.**

Eject Slide

The preview scan should take a little less than one minute to complete, with slight variations in speed depending on the model of your Macintosh and the size of your display. Upon completion, the preview image will stay in the Scan dialog box while you prepare for the final scan.

Final Scan

The next step is to perform the final scan at a higher resolution, or image quality. First, we have to crop, or trim the preview image. Notice there is a narrow black border around it. We want to eliminate this from the scanning area so that it does not appear in our final scan.

Setting the Crop

Start by placing the cursor anywhere over the preview, clicking and dragging a *crop rectangle* to enclose the area of interest. Adjust the crop rectangle by placing the cursor on any of the small boxes, or 'hot spots,' on the crop rectangle. The cursor will change to an arrow when it is placed over any of these boxes. Now, move the rectangle inward by clicking and dragging until the border line of the rectangle encloses the area of interest, as in Figure 5.4a for Coolscan and Figure 5.4b for LS-3510AF. Repeat this step using the other small boxes, as necessary, until you have cropped the image to its edges, and the unexposed, or black area is completely outside of the rectangle. Note that the crop rectangle does not appear if the full image area is selected.

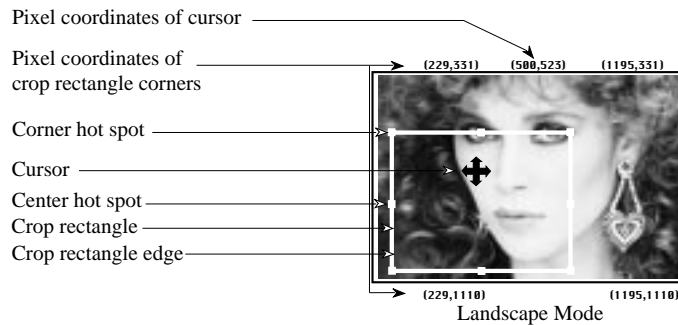


Figure 5.4a Selecting a crop area – Coolscan.

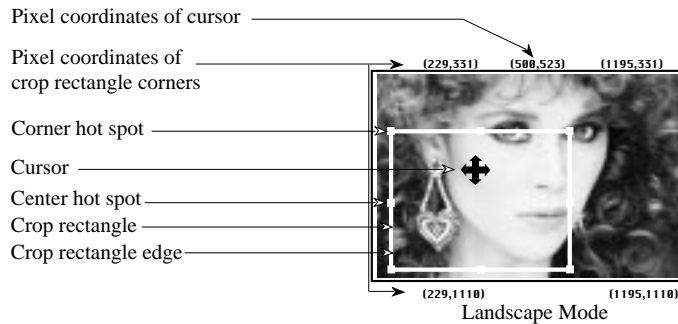


Figure 5.4b Selecting a crop area – LS-3510AF.

The dimensions, resolution, and pitch setting in the preview window can be left at the default setting of 9 x 6 inches, 72 pixels/inch, and 6, respectively.

You are now ready to make the final scan. Click on the **SCAN** button, as shown in Figure 5.5, at the lower-right corner of the Main Scan dialog box. The scanner will begin the scanning cycle. Again, the **SETTING UP THE SCANNER** dialog will appear on your screen. This will be followed immediately by the *scanning progress indicator*, which shows the approximate duration of the scan and the portion remaining to be completed. The scanning progress indicator will appear at the bottom of the window in PhotoStyler and Photoshop/PC. Coolscan users should also see the green LED on the scanner's front panel blink on and off as the scan proceeds, while LS-3510AF users should see the green **BUSY LED** illuminated. The final scan should take approximately two minutes to complete, with slight variation in speed depending on the model of your PC and the size of your display.

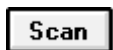


Figure 5.5 Start your final scan by clicking the **SCAN** button.

Unlike the preview scan, the image will not display on the screen as the scan progresses. Instead, you will see the scanning progress indicator. The final scan will appear upon completion in a new window labeled "UNTITLED-1." You will want to save the file with an appropriate name, so it will be easy to locate later on. You can save the image in the normal manner, using the **SAVE AS...** command located under the **FILE** pull down menu or close the window and begin again.

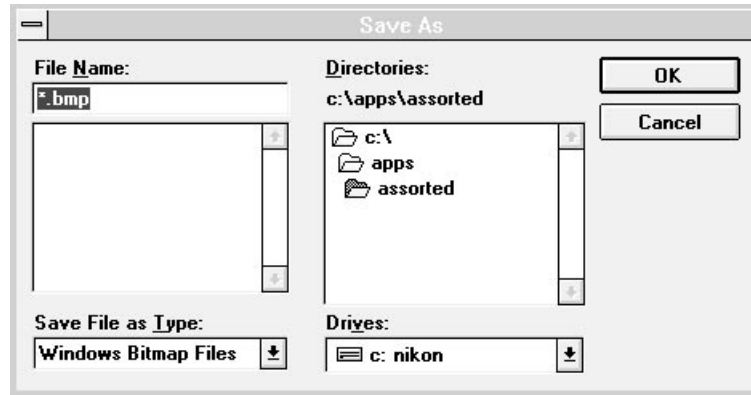


Figure 5.6 The SAVE AS... dialog.



You will not be able to see the high-quality color produced by the scanner unless your computer is configured with a 16-bit or 24-bit display card. Using an 8-bit VGA card will display a dithered, or softened image, comprised of many small dots.

Conclusion

Congratulations! You have completed “Getting Started!” Feel free to continue by exploring on your own. However, to take advantage of the full functionality of the scanner we strongly recommend reading the following chapters. In them, you will learn the fundamentals of scanning, managing different film formats, adjusting color, contrast, and brightness, and utilizing the software controls.

Producing a Scan

This chapter will take you through the ten basic steps in performing a scan using either the Nikon Control or third-party application with the Nikon Scanner plug-in software. It will introduce you to scanning and the scanner controls in more detail than in the “Getting Started” chapters. This chapter assumes that the Nikon Control stand-alone application and/or Nikon Scanner plug-in have been properly installed, and the Main Scan dialog is open.

The ten steps to a quick scan are as follows:

- Step 1. Insert the slide into the scanner**
- Step 2. Launch the application program**
- Step 3. Select the film type and orientation**
- Step 4. Perform a preview scan**
- Step 5. Select the size (dimensions) of the scan**
- Step 6. Select the final resolution of the scan**
- Step 7. Select the area to scan**
- Step 8. Perform a final scan**
- Step 9. Name the file**
- Step 10. Eject/Remove the slide**

These ten steps are described here in greater detail.

Step 1. Insert the slide into the scanner

The first step required is, of course, to insert the slide into the scanner. Selecting and orienting the scanned image is described in detail in Chapter Twelve of this manual.

Step 2. Launch the application program

Macintosh: Launch the Nikon Control software by double-clicking on its icon. The Nikon Scanner plug-in will then be loaded and the Main Scan dialog displayed.

If you are using the Nikon Scanner plug-in with a third-party application that supports Photoshop plug-ins, select the NIKON SCANNER item from the ACQUIRE submenu in the FILE pull-down menu, as illustrated in Figure 4.4 in Chapter Four.

Windows: Launch the Nikon Control software by double-clicking on its icon. The Nikon Scanner plug-in will then be loaded and the Main Scan dialog displayed.

If you are using the Nikon Scanner plug-in with a third-party application that is supported by the Nikon Installer, select the NIKON SCANNER item from the appropriate menu in the application.



Commands from the user interface can be invoked via a keyboard shortcut, by holding down the Alt key and striking the letter which is underlined on the command button. For example, the PREVIEW command can be invoked by holding down the Alt key and striking the “V” key, the letter underlined on the PREVIEW button. This keyboard shortcut is *not* available for every command.

Step 3. Select the film type and orientation

Step 3 requires that you make sure that the film type is correctly indicated. There are four possible film types:

1. Positive color (slide)
2. Negative color (print film)
3. Positive black and white
4. Negative black and white

The scanner will perform image processing based on the film type selected, so it is critical to indicate the correct film type. The film type should be selected *before* a preview or final scan is executed.

The film type is selected through the FILM TYPE selection box in the Scan dialog box, as shown in Figure 6.1a for Macintosh, and Figure 6.1b for Windows. This is accomplished by holding down the mouse button within the selection box and dragging until the desired film type is highlighted in black. The mouse button is then released and the selected film type becomes active.

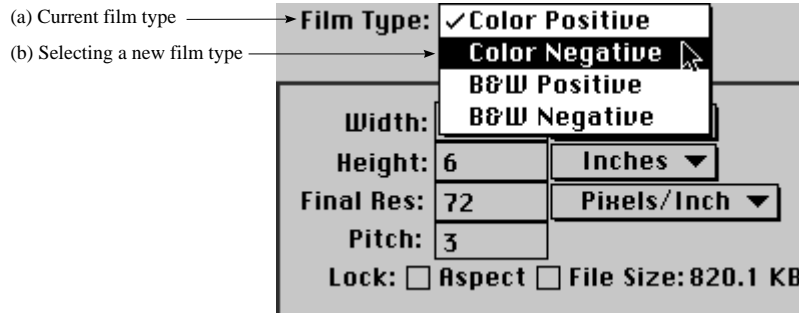


Figure 6.1a Film type selection in the lower left corner of the Scan dialog box – Macintosh. (a) The FILM TYPE selection box showing the currently selected film type. (b) Changing the film type.

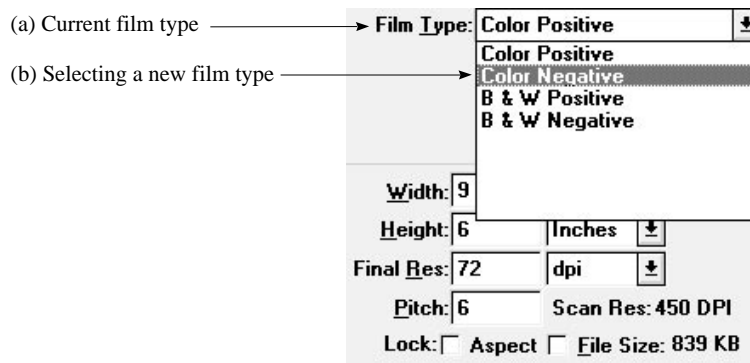


Figure 6.1b Film type selection in the lower left corner of the Scan dialog box – Windows. (a) The FILM TYPE selection box showing the currently selected film type. (b) Changing the film type.

The film inserted into the scanner is oriented as either portrait or landscape. In order for the software to correctly display the preview image, it must first know the orientation of the image. The final scan will be properly oriented based on this selection.

The image orientation button is located adjacent to the preview image window. The symbol on the face of this button changes to reflect which orientation the film is assumed to be in in the LS-3510AF. In the LS-3500 and Coolscan the *film* is always oriented the same way. The buttons are used to re-orient the resulting image. In the portrait orientation the button looks like this:



Figure 6.2 Image orientation button in portrait mode.

Clicking the mouse on this button will cause the image orientation to toggle between portrait and landscape mode. In the landscape orientation, the button looks like this:



Figure 6.3 Image orientation button in landscape mode.

Step 4. Perform a preview scan

The preview scan is a low resolution scan of the entire frame of film. Think of the preview scan as a 'snap shot' of the image. Once the image is on the screen, you can set the parameters for the final scan, such as resolution, size, cropping the area of interest, and adjustment of the contrast, brightness and color balance. As you change these parameters you will see the results displayed on the screen, thus enabling you to preview the effect they would have on the final scan.

Perform a preview scan by clicking on the PREVIEW button.



Figure 6.4 The PREVIEW button – Macintosh and Windows.

Once the PREVIEW button is clicked, the scanner will set its exposure, then make a preview scan. The image will display on a line-by-line basis as the preview progresses.

The preview image will remain in the Scan dialog box as you prepare for the final scan. If you cancel the dialog box without making a final scan, and return to it later, the last preview scan taken will be displayed.

Step 5. Select the size of the scan

The next step is to select the area of the preview scan for final scanning. In some cases, the entire preview, or film area may be chosen. Other times, only a portion of the preview may be desired as the image for the final scan.

As an example, let's select a portion of the image that would be used to create a 4" x 6" final scan size.

To accomplish this, you will have to set the width and height fields of the sizing portion of the Scan dialog box, then position the resulting crop rectangle. First, set the width to 4 inches by entering "4" into the WIDTH value edit box. Note that the units, in this case inches, for width and height are set by default.



Figure 6.5a The WIDTH value edit box – Macintosh.



Figure 6.5b The WIDTH value edit box – Windows.

Similarly, set the height to 6 inches by entering "6" into the HEIGHT value edit box.



Figure 6.6a The HEIGHT value edit box – Macintosh.



Figure 6.6b The HEIGHT value edit box – Windows.

Note that the size of the crop rectangle seen in the preview image area has changed to reflect the new dimensions. Do not be concerned about the selected boundaries yet. You will adjust the crop rectangle in Step 7.

Step 6. Select the final resolution of the scan

The final resolution determines the amount of detail captured in the scan. The final resolution setting is especially important because it will affect how your scans will look when reproduced for print applications. Therefore, the final *output* resolution (the resolution at which your scan will be reproduced) will require a certain *input* scan resolution. This will affect the size of the resulting file. The higher the resolution, the greater the file size. For example, a 4" x 5" scan at an output scan resolution of 72

dots/inch would create a 364.5 kilobyte file. A 4" x 5" scan at an output resolution of 288 dots/inch would create a 5.7 megabyte file.

As a starting point for high-quality print reproduction, set the output scan resolution, or *final res*, to be about *twice* the printing line screen resolution. For example, if you know you will be printing an image at 150 lines per inch, your input scan resolution would be approximately 300 pixels or dots per inch.

In this case, let's set the final resolution to 72 pixels/inch. Note that the crop rectangle does not change.



Figure 6.7a Setting the FINAL RESOLUTION – Macintosh.



Figure 6.7b Setting the FINAL RESOLUTION – Windows.

As mentioned, changing the final resolution automatically changes the *pitch* of the scanner stage mechanism (scanner resolution). The pitch is automatically set by changing the output resolution. Therefore, all you really need to know is what *output* resolution, or FINAL RES, you want. See page 96 for an explanation of scanner *pitch*.

The new values for these fields follow. We won't modify the pitch at this time.



Figure 6.8 The scan PITCH (input scan resolution) – Macintosh and Windows.

Lock the file size

Since you have entered the width, height and output resolution, let's make sure that these parameters cannot be changed when you reposition the crop rectangle in Step Seven.

There are two ways to lock the scan dimensions. For now, lock the file size by clicking in the LOCK FILE SIZE box.



Figure 6.9a Locking the FILE SIZE – Macintosh.

Lock: Aspect File Size:

Figure 6.9b Locking the FILE SIZE – Windows.

Locking the file size results in a lock icon appearing in the sizing area. The sizing cannot be changed unless the file size is unlocked.

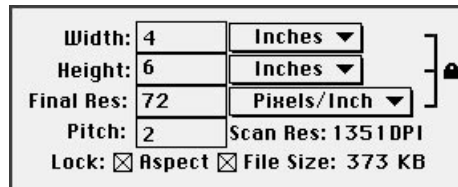


Figure 6.10a Results of locking the file size – Macintosh.

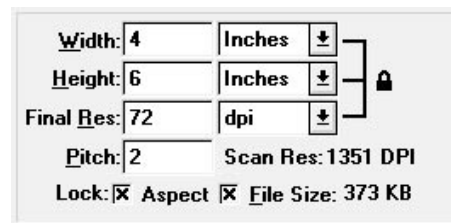


Figure 6.10b Results of locking the file size – Windows.

Step 7. Select the area to scan

Now that you have defined the final size of the image contained by the crop rectangle, it is necessary to position the crop rectangle such that only the desired portion of the film is scanned. This is accomplished graphically, using the mouse.

Position the cursor inside the crop rectangle such that the four-way arrow is visible. Now hold down the mouse button and move the cursor. Note that the entire crop rectangle moves with the cursor. Position the crop rectangle over the area of the film you wish to scan and release the mouse button.

Adjust the size of the crop by clicking on the corner or side 'handles' of the rectangle, and dragging to a new size. The output dimensions and resolution will *not* change. See page 99 for a detailed explanation of the crop rectangle tool.

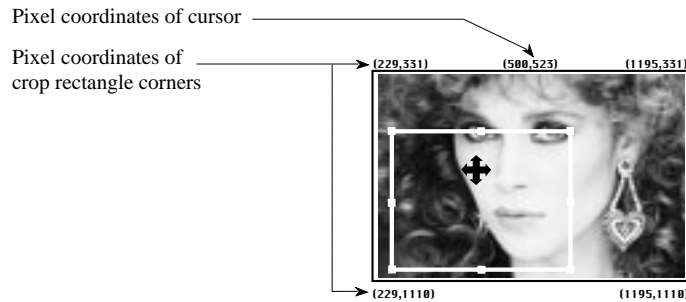


Figure 6.11 Positioning the crop rectangle.

Note that the pixel coordinates at the four corners of the preview window have changed in accordance with the new crop rectangle location.

Step 8. Perform a final scan

Now that you have set the scanning parameters, simply click on the SCAN button to execute the final scan.



Figure 6.12 The SCAN button – Macintosh and Windows.

The Nikon Scanner control will keep you informed of the progress of the scan operation by displaying status messages during the scan.

Step 9. Name the file

Now that the final scan is done, it is necessary to name the scan file in order for it to be saved. To do so, select the SAVE AS... command from the FILE pull-down menu.

Select the location and file type, enter a file name for the resulting file, then click on SAVE.

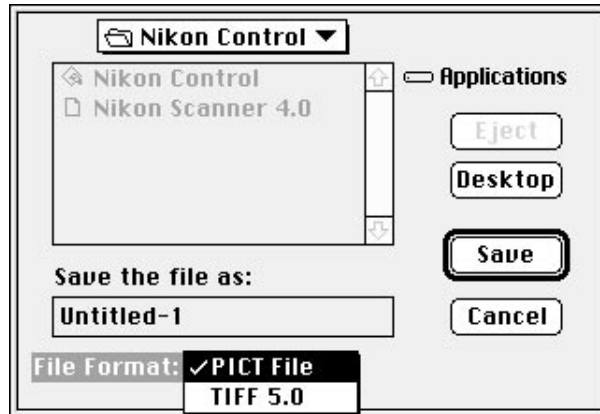


Figure 6.13a Saving an image using the SAVE AS... dialog – Macintosh.

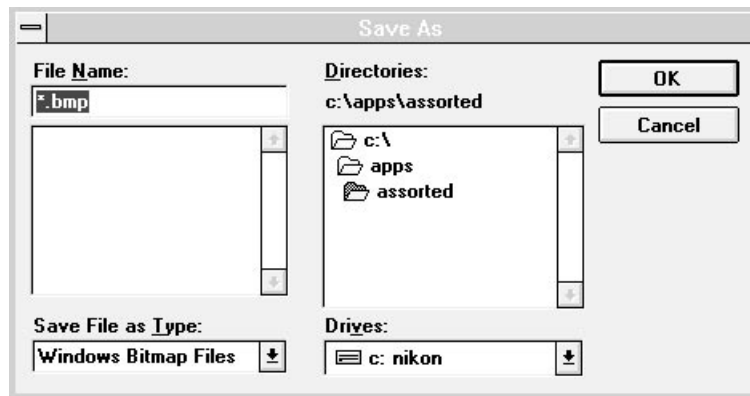


Figure 6.13b Saving an image using the SAVE AS... dialog – Windows.

Step 10. Eject/Remove the slide

Macintosh: For Coolscan scanners, the slide can be ejected by either clicking on the EJECT button, or by selecting the EJECT menu item in the FILE pull-down menu. After a few moments, the slide can be easily removed from Coolscan's film slot. You may also run the Eject Coolscan Film application. If you are using System 7, place the Eject Coolscan Film application in the Apple Menu Items folder, located within your System Folder.



Figure 6.14a The EJECT button – Macintosh.

For LS-3510AF scanners, simply open the dustcover and remove the slide holder from the scanner.

Windows: The slide can be ejected by clicking on the EJECT SLIDE button. After a few moments, the slide can be easily removed from Coolscan's film slot. You may also run the Eject Coolscan Film application to accomplish this.



Figure 6.14b The EJECT SLIDE button – Windows.

For LS-3510AF scanners, simply open the dustcover and remove the slide holder from the scanner.

Introduction to the Nikon Scanner Plug-in

Introduction

The Nikon Scanner plug-in software provides the novice or expert user with a simple to use, fast and effective scanning tool for use with Nikon scanners. The Nikon Scanner plug-in is the core software module of the scanning system, providing a standardized user-interface to control Nikon scanners from within various imaging applications.

As you have seen in the previous chapters of this manual, use of the Nikon Scanner plug-in requires that a compatible imaging application program be installed on your system.

For **Macintosh** computers, the plug-in can be used with any application that can access a Photoshop plug-in. Nikon cannot guarantee proper operation with applications not providing *full* support for Adobe Photoshop plug-ins. Please contact your application vendor to determine the level of Photoshop plug-in compatibility. If, however, you wish to use an application that does not provide full support for Adobe Photoshop plug-ins, select the Version 1 plug-in from the Tools dialog box, shown starting on pg. 67 of this reference. Note that the disk space feature will not provide accurate readings when using the Version 1 plug-in.

You have seen a simple imaging software application is provided for use with Nikon scanners called Nikon Control. This application was developed specifically to use the Nikon Scanner plug-in.

For **IBM PC or compatible** computers running Windows, the plug-in can be used with Photoshop/PC, Picture Publisher, Nikon ImageAccess, or PhotoStyler. You have seen a simple imaging software application is provided with Nikon scanners called Nikon Control. This application was developed specifically to use the Nikon Scanner plug-in.

This chapter provides a thorough description of the Nikon Scanner plug-in, including how to access the plug-in from your application, and a description of how to interact with the various types of dialogs and controls. Some of the material covered here has been introduced in previous chapters, so you will already be familiar with certain parts.

Launching the Nikon Scanner

Macintosh: For Macintosh users, to access your Nikon Scanner plug-in you must first launch your imaging application, such as Photoshop, shown in Figure 7.1.



Figure 7.1 Launching the imaging application – Macintosh.

A menu bar associated with the Photoshop application will appear at the top of the screen. It will look similar to the one shown in Figure 7.2.



Figure 7.2 The Photoshop Main menu.

Click on the FILE portion of the Main menu. Notice the file pull-down menu looks similar to the following illustration. Without releasing the mouse button, pull down until the ACQUIRE item is highlighted, as shown in Figure 7.3, and drag the cursor to the right, following the arrow to the right of the ACQUIRE item, and highlighting NIKON SCANNER. Release the mouse button. This will initialize the plug-in's Main Scan dialog box.



Figure 7.3 Selecting NIKON SCANNER from the Photoshop FILE pull-down menu – Macintosh.

Windows: To access the Nikon Scanner plug-in you must first launch your imaging application, such as Photoshop, shown in Figure 7.4.



Figure 7.4 Launching the imaging application – Windows.

Click on the FILE portion of the Main menu. Notice the file pull-down menu looks similar to the following illustration. Without releasing the mouse button, pull down until the ACQUIRE item is highlighted, as shown in Figure 7.5, and drag the cursor to the right, following the arrow to the right of the ACQUIRE item, and highlighting NIKON SCANNER. Release the mouse button. This will initialize the plug-in's Main Scan dialog box.

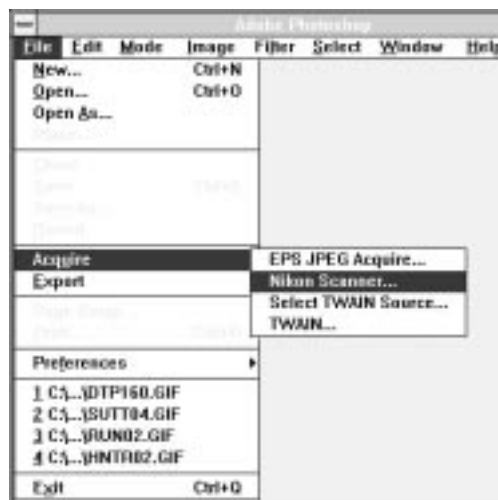


Figure 7.5 Selecting NIKON SCANNER from the Photoshop FILE pull-down menu – Windows.

Plug-in Initialization

Macintosh: The plug-in will first set up the software environment and display the following message.



The plug-in will next search the SCSI or GPIB bus, depending on the type of scanner, to ensure that your scanner is installed and functional. For SCSI-type scanners, while it is searching, the following message will appear:

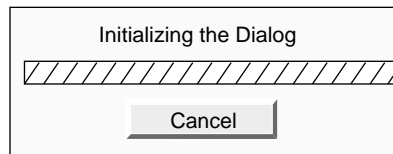


Or for GPIB model scanners, the following message will appear:



Once the plug-in opens the functional SCSI or GPIB scanner, you will be able to commence scanning. In the unlikely event that an error message appears, consult the "Troubleshooting – Macintosh" chapter in this manual.

Windows: The plug-in will first set up the software environment and display the following message:



The plug-in will next search the SCSI or GPIB bus, depending on the type of scanner, to ensure that your scanner is installed and functional.

Once the plug-in opens the functional SCSI or GPIB scanner, you will be able to commence scanning. In the unlikely event that an error message appears, consult the "Troubleshooting – Windows" chapter in this manual.

The Scan Dialogs

Macintosh: The Nikon Scanner plug-in's main scanning dialog box is called the Main Scan dialog. There are three sizes of this scan dialog, designed to best accommodate the wide variety of available monitor sizes. Macintosh PowerBooks are supported with appropriate artwork, depending on the available display. These three different sized dialog boxes offer similar functionality, with the dialog box for large screens offering a substantially larger preview, making such operations as color correction and cropping easier and more precise.

The scan dialog shown in Figure 7.6 is the dialog used for monitors that have resolutions of 832 x 624 pixels or larger, including 16" through 21" screens.



Figure 7.6 The Nikon Scanner plug-in's Main Scan dialog for monitors that display more than 832 x 624 pixels – Macintosh (Coolscan connected).

The scan dialog shown in Figure 7.7 is the default dialog size for monitors with resolutions that are *less* than 832 x 624 pixels, that include 9" through 14" screens.



Note that using the larger dialog results in longer preview times. The dialog size can be changed in the Tools dialog, explained later in this chapter.



Figure 7.7 The Nikon Scanner plug-in's Scan dialog for monitors that display less than 832 x 624 pixels – Macintosh (Coolscan connected).

Most scanning operations can be performed from this dialog box, including selecting the film type, previewing the image, fine focusing, cropping the image, and performing basic brightness, contrast and color balance tasks.

Windows: The Nikon Scanner plug-in's main scanning dialog box is called the Main Scan dialog. There are two versions of this Scan dialog, designed to best accommodate the wide variety of available monitor sizes. These two different sized dialog boxes offer similar functionality, with the dialog box for large screens offering a substantially larger preview, making such operations as color correction and cropping easier and more precise. There are only some minor differences involving the position of the controls within the Scan dialog.

The scan dialog shown in Figure 7.8 is the dialog used for monitors that have resolutions of 800 x 600 pixels or larger with small fonts, and 1024 x 768 pixels or larger with large fonts.



Figure 7.8 The Nikon Scanner plug-in's Main Scan dialog for monitors that have resolutions of 800 x 600 pixels or greater using small fonts, or 1024 x 768 pixels or greater using large fonts – Windows (Coolscan connected).

The Scan dialog shown in Figure 7.9 is the default dialog size for monitors that have resolutions of 640 x 480 pixels with small fonts, and 800 x 600 pixels with large fonts.



Using the larger dialog results in longer preview times. Appropriate font and monitor settings for your particular monitor are available in the Windows Setup Application.



Figure 7.9 The Nikon Scanner plug-in's Main Scan dialog for monitors that have resolutions of 640 x 480 pixels, using small fonts, or 800 x 600 pixels using large fonts – Windows (Coolscan connected).

Most scanning operations can be performed from this dialog box, including selecting the film type, previewing the image, fine focusing, cropping the image, and performing basic brightness, contrast and color balance tasks.

Using the Nikon Scanner Plug-in

You should already be familiar with most of the controls in the Nikon Scanner plug-in from the previous chapters of this manual.

Following is a brief summary of the dialogs and controls used in the plug-in, with a description of how to interact with them.

Message Boxes

A *message box* contains program information. This includes the application name and version number, the amount of available disk space, and help messages. You cannot modify the text of these messages.



Figure 7.10a The message box (Macintosh) showing software version number, ROM version, SCSI ID number, and available disk space. The far-right button is used for GPIB interfaced scanners, such as the Nikon LS-3510AF and LS-3500.



Figure 7.10b The message box (Windows) showing software version number, ROM version, SCSI ID number, and available disk space. The GPIB button is used for GPIB interfaced scanners, such as the Nikon LS-3510AF and LS-3500.

Buttons

Buttons, such as the ones below are activated by clicking them once with the mouse. These three-dimensional buttons are in their active state when they are displayed with contrast, as seen in Figure 7.11.



Figure 7.11 Button in active state.

In their inactive state these buttons appear dimmed, as seen in Figure 7.12.



Figure 7.12 Button in inactive state.

Value Edit Boxes

There are various small boxes within the scanning dialog box called *value edit boxes*. The boxes adjacent to the HEIGHT and WIDTH parameters are two examples of value edit boxes. The contents of these value edit boxes can be changed by using a number of editing methods.

The first method is to double-click the mouse inside the text box. The text box changes to the current highlight color (depending upon how your system is set up), and all text inside the box becomes selected. Typing text or a number will replace whatever text or number that was in the box.

The second and third methods are similar. Clicking once inside the box will cause a cursor to be present at whatever point you clicked. Text or numbers then keyed in will be inserted *after* the cursor. The third method is to click once inside the box, again causing a cursor to be present at whatever point you clicked, then holding the mouse button down and dragging in the direction of the portion of text or number you wish to edit. The portion you dragged over will change to your current highlight color (depending upon how your system is set up), at which point you can key in any text or number to replace it. These methods provide selective editing capability, as you can place the cursor at any point within a text or number string. The fourth method is to Tab from one box to the next. Shift – Tab will move in reverse order. The Tab key will highlight the entire value edit box. Values are not set until you leave the value edit box, using the Tab key or the mouse cursor.



Figure 7.13 Value edit box – Macintosh and Windows.

Pop-up Menus - Macintosh Combo Boxes – Windows

Pop-up menus, as seen in Figure 7.14a, look like value edit boxes with the exception that they include a downward pointing arrow and a shadow line. The Windows equivalent, called *combo boxes*, is seen in Figure 7.14b. When the mouse is clicked with the cursor positioned inside the pop-up menu or combo box, a list of items will appear beneath the top-most item. These are the additional options you have to choose from for this parameter. Only one item can be selected at a time for each of the pop-up menus or combo boxes used in the Nikon Scanner plug-in. The currently selected option will be the one displayed in the selection box.

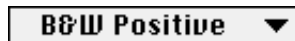


Figure 7.14a Pop-up menu selection box – Macintosh.

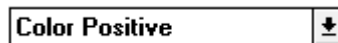


Figure 7.14b Combo box – Windows.

In order to change the selected item, hold the mouse button down and move up and down the pop-up menu or combo box. This will display all the menu options, the currently selected option being designated by a check mark next to it. Place the reverse text box (white text in a black box) over the option you wish to select, as shown in Figure 7.15a and Figure 7.15b. Release the button and the selection box will display the new choice.

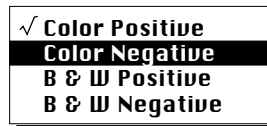


Figure 7.15a Pop-up menu options – Macintosh.

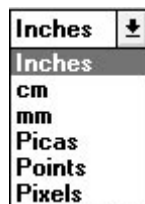


Figure 7.15b Combo box options – Windows.

Graphics Windows

A *graphics window* is an area of the Scan dialog box that displays all or part of an active image. The preview image area in the Scan dialog box and the Gamma Curve Editor are graphics windows. Special rules apply to the use of these windows and each is described in detail in the relevant chapters.

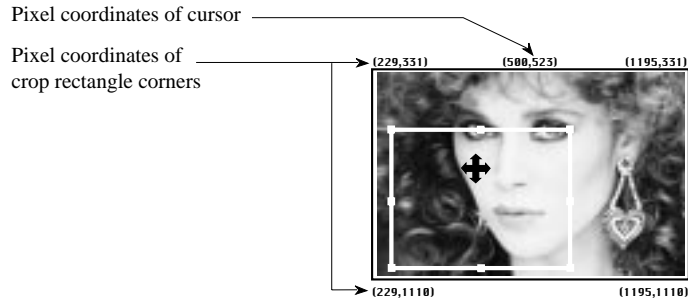


Figure 7.16 Graphics Window showing the crop rectangle.

Using the Mouse to Control the Scan Dialog

The mouse cursor changes shape depending on where the cursor is positioned within the Scan dialog box.

When the cursor is located over the text portion of the scan dialog box the cursor assumes the shape of an arrow, as seen in Figure 7.17. The cursor will be in the shape of an arrow when buttons are clicked, selections are made in a selection box, or when text or numbers are entered into value edit boxes.



Figure 7.17 Arrow cursor.

When the mouse cursor is located over the image area in the Scan dialog box, but not within the crop rectangle, it assumes the shape of a crosshair, as shown in Figure 7.18. The color of the crosshair changes to provide contrast with the image. For example, if the cursor is located over a black or dark area the cursor will change to a light color, and vice versa in white or light areas. The appearance of the crosshair cursor indicates that a new crop rectangle will be drawn if the mouse is clicked and dragged.



Figure 7.18 Crosshair cursor.



Figure 7.19 Four-way arrow cursor.

When the mouse cursor is located over the image area of the Scan dialog box *and* within the crop rectangle, the cursor takes the shape of a four-way arrow, as seen in Figure 7.19.

The Gamma Curve Editor Dialog Box

More sophisticated color control operations can be implemented through use of the Gamma Curve Editor dialog box. Like the Scan dialog, the controls in the Gamma Curve Editor dialog are positioned differently, depending on the size of your display. The Gamma Curve Editor dialogs shown in Figure 7.20a and Figure 7.20b are the large dialogs for Macintosh and Windows, respectively.



Figure 7.20a The large Gamma Curve Editor dialog box – Macintosh.



Figure 7.20b The large Gamma Curve Editor dialog box – Windows.



Using the larger dialog results in longer preview times. This can be changed in the Tools dialog, explained later in this chapter.

The Gamma Curve Editor dialogs, shown in Figure 7.21a and Figure 7.21b, are the small dialogs for Macintosh and Windows, respectively. Refer to Table 11.1 in Chapter Eleven for specific information on monitor size, resolution, and preview size.



Figure 7.21a The small Gamma Curve Editor dialog box – Macintosh.

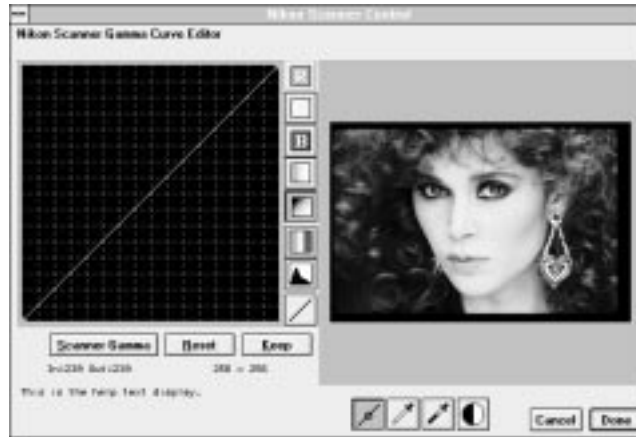


Figure 7.21b The small Gamma Curve Editor dialog box – Windows.

This Gamma Curve Editor dialog box is invoked from the Scan dialog box by clicking on the Curve button, shown in Figure 7.22.



Figure 7.22 The Gamma Curve Editor button.

The Tools Dialog Box

The Tools dialog box, shown in Figures 7.23a and 7.23b for Coolscan – Macintosh and Windows, and in Figures 7.24a and 7.24b for LS-3510AF – Macintosh and Windows, enables you to perform basic diagnostic functions on your scanner. Do not be put off by the complexity of this dialog. There are three items that you will need to be concerned with. These are the USE LARGE SCREEN check box, the SCANNING FOCUS check box, the CALIBRATE LAMP button (LS-3510AF only) and the SCSI and GPIB selection buttons. The rest of the Tools dialog box can be ignored for now, since its primary function is service related. INTERACTIVE HELP will provide an explanation of all the controls, but be aware that large amounts of data are generated by certain service functions, so it is best to ignore them unless directed to perform an operation by a Nikon service technician.



Figure 7.23a The Tools dialog box for Coolscan – Macintosh.

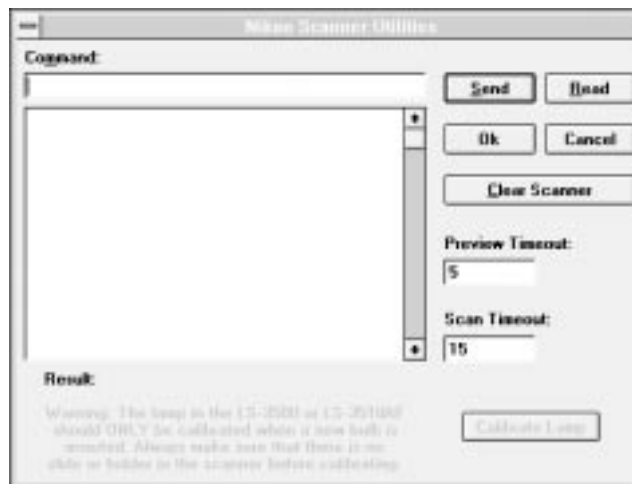


Figure 7.23b The Tools dialog box for Coolscan – Windows.

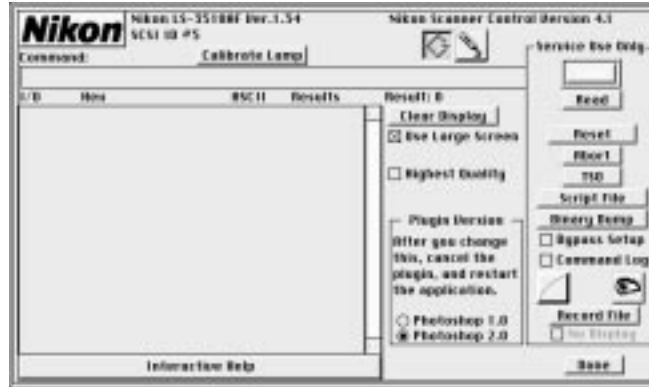


Figure 7.24a The Tools dialog box for LS-3510AF (SCSI) – Macintosh.

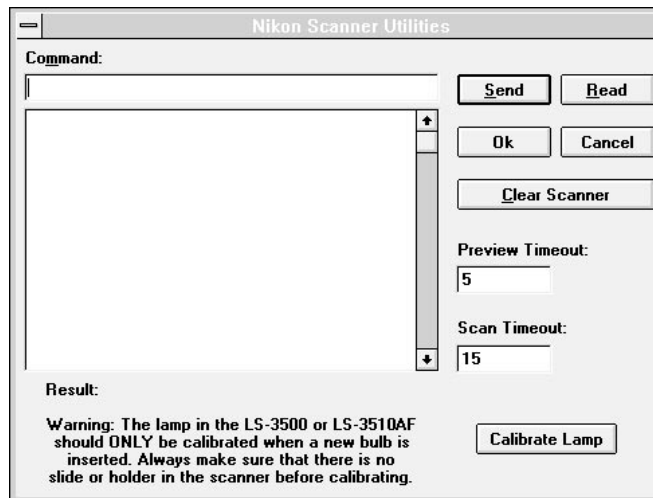


Figure 7.24b The Tools dialog box for LS-3510AF – Windows.

The Tools dialog box is invoked by clicking on the Tools button in the Scan dialog, shown in Figure 7.25.



Figure 7.25 The Tools button.

Selecting the Scan Dialog Size

Macintosh: The Nikon Scanner plug-in automatically adjusts the size of the dialog box based on the screen size. At times, you might desire to change the screen size. You can force a large screen size by checking the **USE LARGE SCREEN** check box, as seen in Figure 7.26. Similarly, you can invoke the small screen size by removing the check mark from this box. If you change the state of the check box, you must exit the Tools dialog, exit the plug-in, then relaunch the plug-in in order for the new screen size to take effect. It is not necessary to restart the application software.



Faster previews can be obtained by unchecking the **USE LARGE SCREEN check box and using the smaller screen size.**



Use Large Screen

Figure 7.26 **USE LARGE SCREEN** check box shown in the Tools dialog box and close-up – Macintosh.

Windows: The Nikon Scanner plug-in allows you to select the small dialog size on a large monitor by holding down the Control key while the plug-in is loading, or by selecting **NEW SCAN** from the **FILE** menu.



Faster previews can be obtained by using the smaller screen size.

Selecting the Focus Method – Coolscan only

Macintosh: The Nikon Scanner plug-in provides two types of focus operations. These are called *Visual Focus* and *Metered Focus*. Both are described in Chapter Fourteen. The plug-in automatically defaults to the Metered Focus technique. This can be changed by checking the SCANNING FOCUS check box, seen in Figure 7.26. If checked, the Visual Focus technique will be employed. If you change the state of the box, you must exit the Tools dialog. It is not necessary to restart the application software.

Windows: The Nikon Scanner plug-in provides two types of focus operations. These are called *Visual Focus* and *Metered Focus*. Both are described in Chapter Fourteen. The plug-in automatically defaults to the Metered Focus technique. This can be changed by holding down the Control key while clicking on the FOCUS button shown in Figure 7.27.



Figure 7.27 The SCANNING FOCUS keystroke.

Interface Buttons

This toggling pair of buttons, which specifies SCSI or GPIB interface, is available in the Main Scan dialog and in the Tools dialog. While opening the plug-in, the software will search the GPIB and then the SCSI bus for any scanners. When found, the device will have its ID displayed in the upper right-hand corner. If no device is found, and one is known to be connected, then the toolkit buttons provide a means to search the bus again for a particular address. If you have more than one Nikon scanner connected to your SCSI or GPIB chain, you will have to manually set the SCSI or GPIB address you wish to use. Do so by clicking the appropriate button, SCSI or GPIB, in the Tools dialog and set the appropriate address using the relevant pop-up menu, as seen in Figures 7.29a and 7.30a for Macintosh, and Figures 7.29b and 7.30b for Windows.



Figure 7.28 The SCSI and GPIB addressing button – Macintosh and Windows.

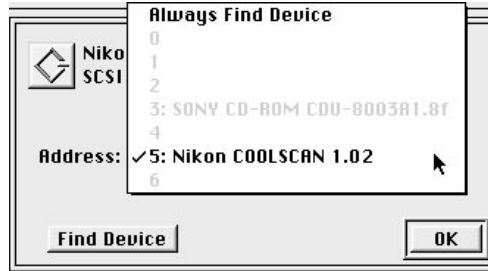


Figure 7.29a The SCSI addressing selection dialog – Macintosh.

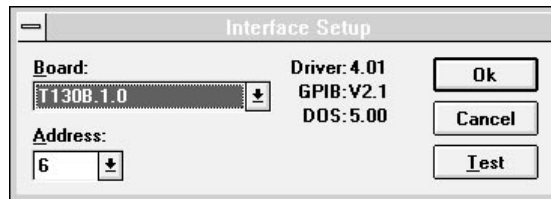


Figure 7.29b The SCSI addressing selection dialog – Windows.

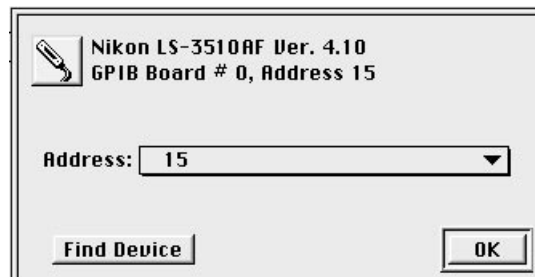


Figure 7.30a The GPIB addressing selection dialog – Macintosh.

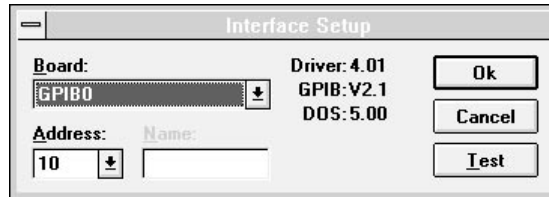


Figure 7.30b The GPIB addressing selection dialog – Windows.

Calibrating the Lamp (LS-3510AF only)



Figure 7.31 Calibrate Lamp button – Macintosh and Windows.



The lamp should be calibrated when the scanner is first unpacked from the shipping carton.

Thereafter, you can recalibrate whenever you change a lamp, or if you install a 12-bit board. If you move the scanner to a new location you may want to recalibrate since the bulb may change position in transit and the illumination pattern must be recompensated. This calibration is *not* intended for daily use. It writes color balance and light distribution shading information to the non-volatile memory in the scanner.



The CALIBRATE LAMP button should be used with caution!

Before calibrating the unit, you must remove any film and film holders from inside. Otherwise it will misinterpret the light balance and attempt to calibrate to a setting that is outside normal limits. This may leave the scanner in a confused state and possibly require a call to Nikon Technical Support to remedy.

To execute a calibration, close the dust cover, click the button within the Tools dialog and wait a couple of minutes while the unit compensates and saves the data. When the busy light finally goes out you will be returned to the Tools dialog.



Do not disturb the scanner while this is taking place or the routines will not complete and the scanner may not calibrate correctly on the next attempt.

You can exit after completion by clicking the DONE button.

The Scanner State

Macintosh: When you launch the plug-in its settings automatically initialize to the state that they were in when it was last closed. Also, the last preview image that was on screen will still be displayed in the preview window.

The plug-in allows you to save and restore settings of the plug-in state through its preferences file. This will be explained in the next chapter.

Windows: When you launch the plug-in its settings automatically initialize to the state that they were in when it was last closed.

With Coolscan, the plug-in allows you to save and restore settings of the plug-in state through its NKNCTRL.INI file. This will be explained in Chapters 8 and 9.

Getting Help

Macintosh: Help can be accessed while in the Scan dialog box or in the Gamma Curve Editor dialog box by clicking on the INTERACTIVE HELP button. When inactive, the INTERACTIVE HELP button is displayed, as shown in Figure 7.32(a).

When active, the INTERACTIVE HELP button is replaced by a message box, as shown in Figure 7.32(b). When the mouse cursor is placed over a control, the appropriate help message for that control appears in this message box. For example, in the Scan dialog box, suppose that the cursor was placed over the FILM TYPE selection box after selecting INTERACTIVE HELP. The message box would relay the information shown in Figure 7.32(b). This function operates identically in the Gamma Curve Editor dialog box.

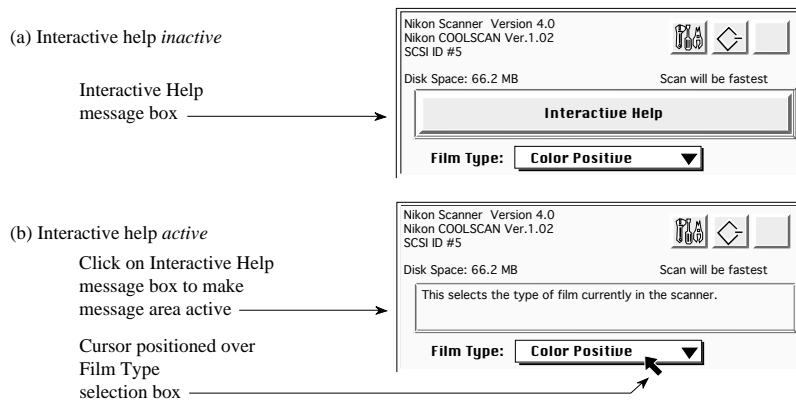


Figure 7.32 The INTERACTIVE HELP button is replaced by a help message for FILM TYPE pop-up menu.

Help is disabled by clicking within the message box. Once disabled, the INTERACTIVE HELP button reappears.

Windows: When the mouse cursor is placed over a control, the appropriate help message for that control automatically appears in the top left-hand corner of the Scan dialog.

Setting and Restoring the Nikon Plug-in State – Macintosh

As you have seen, there are many user-controlled settings associated with the Nikon Scanner plug-in. These user-controlled settings are referred to as the plug-in *state*. It is understood that you will not want to fix each setting every time you want to scan. To avoid this, the Nikon Scanner plug-in includes a simple method of managing the setting and restoring of the plug-in state.

There are three ways to set and restore the Nikon Scanner plug-in's initial state as shown in Figure 8.1. These include the standard startup conditions shown in Figure 8.1a, the default conditions shown in Figure 8.1b, and the user named settings files shown in Figure 8.1c.

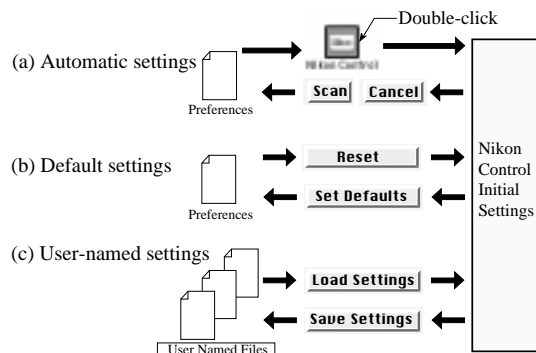


Figure 8.1 Setting the Nikon Scanner plug-in state. (a) This method is used automatically upon starting and exiting the application. (b) The set default method allows you to save and restore the state through an un-named file. (c) The user-named method allows you to save and restore the state through named files.

The *automatic method* of setting and saving the plug-in state involves saving the state each time the application exits, and then restoring this state the next time the application is run. In Figure 8.1a, it is seen that clicking on either the CANCEL or SCAN buttons causes the last state of the plug-in to be stored in the plug-in preferences file. When the plug-in is run, these saved settings are used as the new startup conditions. This includes the image present in the preview image window.

The *set default method* allows you to set aside the current plug-in state for ready access at a later time by clicking on the SET DEFAULTS button. This is shown in Figure 8.1b. The RESET button can be clicked at any time to restore the plug-in to the default state in the preferences file.

The *user-named method* is similar to the set default method, but is meant for long-term storage of settings. This is shown in Figure 8.1c. Several different states can be stored by giving each a unique name. The plug-in saves the current settings to a named file when the SAVE SETTINGS button is clicked. Similarly, it resets the current settings to those settings in a named file when the LOAD SETTINGS button is clicked.

The Settings Controls

There are four buttons associated with the saving and restoring of the plug-in state. These include the RESET, SET DEFAULT, LOAD SETTINGS and SAVE SETTINGS buttons. All of these are found in the Scan dialog.

Reset

The RESET button, shown in Figure 8.2, provides a means to set the plug-in state to the default values in the plug-in preferences file. These default values can be changed by clicking the SET DEFAULTS button.

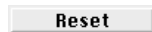


Figure 8.2 The RESET button.

Set Defaults

The SET DEFAULTS button, seen in Figure 8.3, provides a means to store the current plug-in settings as the default state in the preferences file. After these new default settings are stored, they can then be recalled by clicking the RESET button.



Figure 8.3 The SET DEFAULTS button.

Load Settings

The LOAD SETTINGS button, shown in Figure 8.4, provides a means to set the plug-in state to the values in a user-named settings file. These values can be set by clicking the SAVE SETTINGS button.

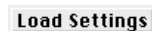


Figure 8.4 The LOAD SETTINGS button.

Save Settings

The **SAVE SETTINGS** button, shown in Figure 8.5, provides a means to store the current plug-in state to a user-named file. These settings can then be recalled through the **LOAD SETTINGS** button.



Figure 8.5 The **SAVE SETTINGS** button.

The Automatic Method

Suppose that you have performed a scan of a particular image. The resulting scan file is imported into a desktop publishing application. Now suppose you want to change the crop of the image. The Nikon Scanner plug-in is then run again. The same settings that existed when you exited the plug-in are automatically in place. The preview image of the film is still present, as well. This saves you a great deal of time, as the only operation required is to change the crop. All other settings are identical. Only under any of the following conditions would there be the need for a new preview scan to be performed:

- The film was moved inside the scanner since the last preview scan.
- The film was removed from the scanner manually, or electronically ejected.
- The scanner's power was turned off.

Summary

To automatically save the state:

- Exit the Nikon Scanner plug-in through the **CANCEL** or **SCAN** buttons.

To automatically restore the state:

- Run the application again.

The Set Default Method

One can think of the set default state as a temporary storage location that can be rapidly accessed. The temporary storage place is in the plug-in preferences file. When the plug-in is first run, there is no state stored in the preferences file. Rather, the plug-in uses its factory default state. These factory default settings are resident in the plug-in itself.

By saving the current state using the **SET DEFAULTS** button, the next time the

RESET button is clicked, the plug-in state will be set to these settings, not the factory defaults.



The factory default settings can be recalled at any time by deleting the preferences file, then restarting the application. If there is no preferences file available, the plug-in will automatically use the factory defaults settings.

Summary

To save the current state as the default state:

- Click on the SET DEFAULTS button.

To invoke the default state as the current state:

- Click on the RESET button.

To restore the factory defaults as the default state:

- Remove the preferences file from the system folder and restart the application.

The User-Named Method

You may desire to have several different scanner settings readily available. To accomplish this, you can load and save these settings into user-named settings files. These files are named by following the standard Macintosh file system conventions.

Clicking on the SAVE SETTINGS button brings up the operating system's SAVE SETTINGS dialog, as shown in Figure 8.6. Once the settings file is named, the current state will be saved. It can be restored at any time through the LOAD SETTINGS button.

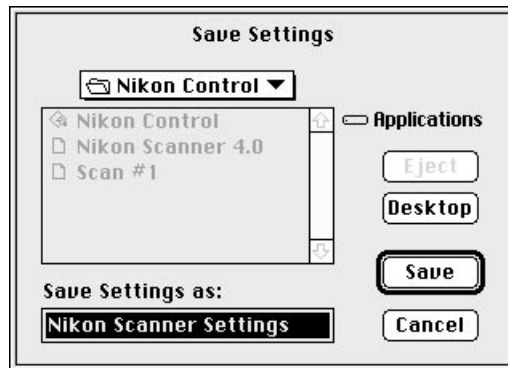


Figure 8.6 The SAVE SETTINGS dialog.

Clicking on the LOAD SETTINGS button prompts the appearance of the SELECT THE SETTINGS FILE dialog, as shown in Figure 8.7. Once the settings file is selected and opened, the state stored in the named file will be loaded in as the current state of the plug-in. Any changes made to this file can be saved through the SAVE SETTINGS button. Make sure, however to give this state a different name if you also wish to retain the original settings file.

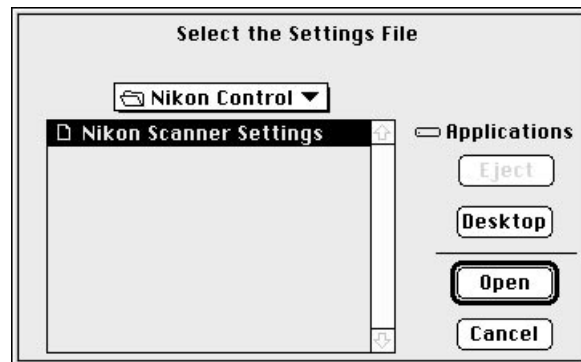


Figure 8.7 The SELECT THE SETTINGS FILE dialog.

Summary

To save the current state to a named file:

- Click on the SAVE SETTINGS button.

To change the current state to the state in a named file:

- Click on the LOAD SETTINGS button.

Setting and Restoring the Nikon Plug-in State – Windows

As you have seen, there are many user-controlled settings associated with the Nikon Scanner plug-in. These user-controlled settings are referred to as the plug-in *state*. It is understood that you will not want to fix each setting every time you want to scan. To avoid this, the Nikon Scanner plug-in includes a simple method of managing the setting and restoring of the plug-in state.

There are three ways to set and restore the Nikon Scanner plug-in's initial state, as shown in Figure 9.1. These include the standard startup conditions shown in Figure 9.1a, the default conditions shown in Figure 9.1b, and the user named settings files shown in Figure 9.1c.

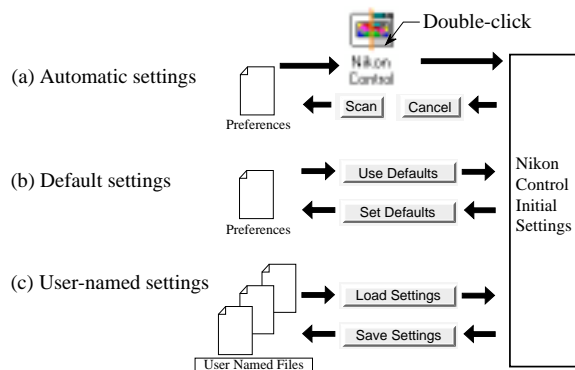


Figure 9.1 Setting the Nikon Scanner plug-in state. (a) This method is used automatically upon starting and exiting the application. (b) The set default method allows you to save and restore the state through an un-named file. (c) The user-named method allows you to save and restore the state through named files.

The *automatic method* of saving the plug-in state involves saving the state when you click the SCAN button, as seen in Figure 9.1a. When the plug-in is run, these saved settings are used as the new startup conditions. The default settings are used after the application is terminated. This includes the image present in the preview image window.

The *set default method* allows you to set aside the current plug-in state for ready access at a later time by clicking on the SET DEFAULTS button. This is shown in Figure 9.1b. The USE DEFAULTS button can be clicked at any time to restore the plug-in to the default state in the NKNCTRL.INI file.

The *user-named method* is similar to the set default method, but is meant for long-term

storage of settings. This is shown in Figure 9.1c. Several different states can be stored by giving each a unique name. The plug-in saves the current settings to a named file when the **SAVE SETTINGS** button is clicked. Similarly, it resets the current settings to those settings in a named file when the **LOAD SETTINGS** button is clicked.

The Settings Controls

There are four buttons associated with the saving and restoring of the plug-in state. These include the **USE DEFAULTS**, **SET DEFAULTS**, **LOAD SETTINGS** and **SAVE SETTINGS** buttons. All of these are found in the Scan dialog.

Use Defaults

The **USE DEFAULTS** button, shown in Figure 9.2, provides a means to set the plug-in state to the default values in the plug-in's **NKNCTRL.INI** file. These default values can be changed by clicking the **SET DEFAULTS** button.



Figure 9.2 The **USE DEFAULTS** button.

Set Defaults

The **SET DEFAULTS** button, seen in Figure 9.3, provides a means to store the current plug-in settings as the default state in the **NKNCTRL.INI** file. After these new default settings are stored, they can then be recalled by clicking the **USE DEFAULTS** button.



Figure 9.3 The **SET DEFAULTS** button.

Load Settings

The **LOAD SETTINGS** button, shown in Figure 9.4, provides a means to set the plug-in state to the values in a user-named settings file. These values can be set by clicking the **SAVE SETTINGS** button.

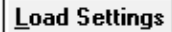


Figure 9.4 The LOAD SETTINGS button.

Save Settings

The SAVE SETTINGS button, shown in Figure 9.5, provides a means to store the current plug-in state to a user-named file. These settings can then be recalled through the LOAD SETTINGS button.

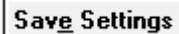


Figure 9.5 The SAVE SETTINGS button.

The Automatic Method

Suppose that you have performed a scan of a particular image. The resulting scan file is imported into a desktop publishing application. Now suppose you want to change the crop of the image. The Nikon Scanner plug-in is then run again. The same settings that existed when you exited the plug-in are automatically in place. The preview image of the film is still present, as well. This saves you a great deal of time, as the only operation required is to change the crop. All other settings are identical. Only under any of the following conditions would there be the need for a new preview scan to be performed:

- The film was moved inside the scanner since the last preview scan.
- The film was removed from the scanner manually, or electronically ejected.
- The scanner's power was turned off.

Summary

To automatically save the state:

- Exit the Nikon Scanner plug-in through the SCAN button.

To automatically restore the state:

- Run the plug-in again.

The Set Default Method

One can think of the set default state as a temporary storage location that can be rapidly accessed. The temporary storage place is in the plug-in's NKNCTRL.INI file. When the plug-in is first run, there is no state stored in the NKNCTRL.INI file. Rather, the plug-in uses its factory default state. These factory default settings are resident in the plug-in itself.

By saving the current state using the SET DEFAULTS button, the next time the USE DEFAULTS button is clicked, the plug-in state will be set to these settings, not the factory defaults.



The factory default settings can be recalled at any time by deleting the NKNCTRL.INI file, then restarting the application. If there is no NKNCTRL.INI file available, the plug-in will automatically use the factory default settings.

Summary

To save the current state as the default state:

- Click on the SET DEFAULTS button.

To invoke the default state as the current state:

- Click on the USE DEFAULTS button.

To restore the factory defaults as the default state:

- Remove the NKNCTRL.INI file from the Nikon Control directory and restart the application.

The User-Named Method

You may desire to have several different scanner settings readily available. To accomplish this, you can load and save these settings into user-named settings files. These files are named by following the standard DOS file system conventions.

Clicking on the SAVE SETTINGS button brings up the operating system's SAVE SETTINGS dialog, as shown in Figure 9.6. Once the settings file is named, the current state will be saved. It can be restored at any time through the LOAD SETTINGS button.

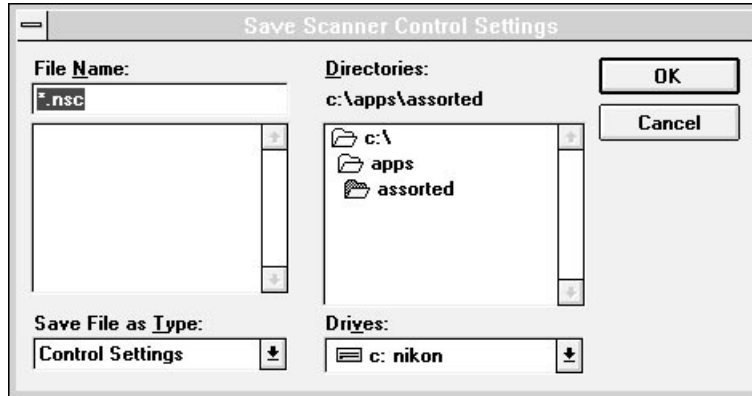


Figure 9.6 The SAVE SETTINGS dialog.

Clicking on the LOAD SETTINGS button prompts the appearance of the LOAD SETTINGS dialog, as shown in Figure 9.7. Once the settings file is selected and opened, the state stored in the named file will be loaded in as the current state of the plug-in. Any changes made to this file can be saved through the SAVE SETTINGS button. Make sure, however to give this state a different name if you also wish to retain the original settings file.

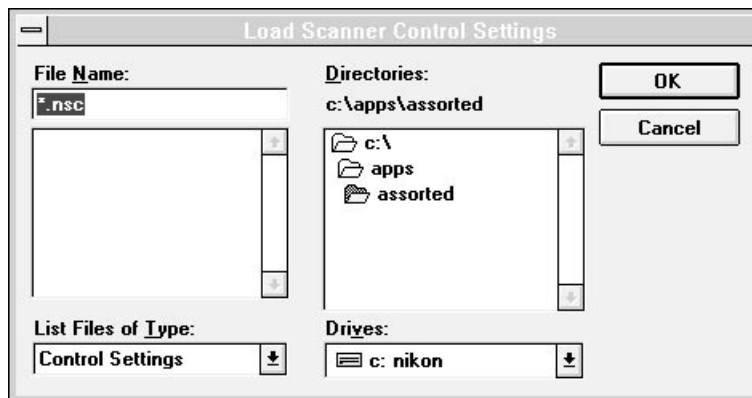


Figure 9.7 The LOAD SETTINGS dialog.

Summary

To save the current state to a named file:

- Click on the SAVE SETTINGS button.

To change the current state to the state in a named file:

- Click on the LOAD SETTINGS button.

Performing a Preview or Final Scan

There are two types of scans, the preview scan and the final scan. Note that only the final scan creates a disk file you can use in other applications.

This chapter will cover the controls for performing a basic preview or final scan. The chapters following will cover in detail the specific scanner controls affecting the preview and final scans.

The Scan Controls

There are three controls directly related to performing a scan. First, the PREVIEW button, used to initiate a preview scan. Second, the SCAN button, used to initiate a final scan. And third, the CANCEL command, which is used to halt a scan that is in progress.

The Preview Button

Clicking the mouse on the PREVIEW button, shown in Figure 10.1, causes the scanner to perform a preview scan. The preview scan enables you to see the film image on the screen and carry out any adjustments before the final scan is performed. The preview scan contains the entire film area.



Figure 10.1 The PREVIEW scan button – Macintosh and Windows.

The Scan Button

Clicking the mouse on the SCAN button, shown in Figure 10.2, causes Coolscan to perform a final scan.




Figure 10.2 The SCAN button – Macintosh and Windows.

The Abort Keystroke

Macintosh: You can abort a preview or final scan at any time by holding down the “⌘” key and striking the period “.” key, as seen in Figure 10.3.



Figure 10.3 The Abort Keystroke: While holding down the “” key, strike the period “.” key.

Windows: You can abort a preview or final scan at any time by pressing and holding down the ESC key for a few moments.

Autoexposure Cycle

Before a preview or final scan is started, the scanner may analyze the entire film surface in order to set the optimum contrast and brightness for the given image. This is referred to as setting exposure in an *autoexposure cycle*. To achieve optimal scanning results it is recommended that an autoexposure cycle be performed whenever you insert a new slide. Whether or not an autoexposure cycle is executed depends on the state of the AUTO check box, as seen in the Scan dialog. There are three possible states:

1) Don't want autoexposure cycle for this image • If the AUTO check box is inactive (blank), as shown in Figure 10.4, no autoexposure cycle will be performed.



Figure 10.4 Autoexposure cycle check box in inactive state – Macintosh and Windows.

2) Want autoexposure cycle for this image • If the AUTO check box is active (contains an “X”), and there is no check mark next to it, an autoexposure cycle will be initiated upon the next scan. This state, shown in Figure 10.5, indicates that you desire an autoexposure cycle because the scanner currently has no available autoexposure data for this image.

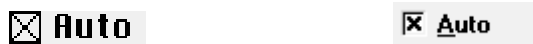


Figure 10.5 Autoexposure cycle check box in active state – Macintosh and Windows.

This is the Nikon Scanner plug-in's default state for the autoexposure cycle. It assumes that you will want autoexposure data.

3) Have autoexposure cycle for this image • The third state, seen below in Figure 10.6, occurs when the AUTO check box is active and there is a check mark adjacent to it. In this case, no autoexposure cycle will be performed upon the next scan.

This state indicates that you want an autoexposure setting and the scanner believes that it has autoexposure data available for this image. Consequently, it will use the data it already has.



Figure 10.6 Autoexposure cycle check box indicating that autoexposure data already exists for an image – Macintosh and Windows.

This is the common state after a preview scan and before a final scan.

Forcing an Autoexposure Cycle

It is sometimes desirable to force a new autoexposure cycle, even when the scanner has what it believes is correct autoexposure data for the image. This is because image characteristics, such as exposure, can vary widely, even within the same film type. To accomplish this, it is necessary to remove the check mark next to the AUTO cycle check box.

This can be achieved by double clicking on the AUTO cycle check box, shown in Figure 10.7.



Figure 10.7 Forcing an autoexposure cycle – Macintosh and Windows.

The first click removes the check mark and the “X” in the autoexposure cycle check box. The second click reinstates the “X” in the AUTO check box, but not the adjacent check mark. This is shown in Figure 10.8.



Figure 10.8 Result of forcing an autoexposure cycle – Macintosh and Windows.



Autoexposure data is stored in the scanner, *not* in the plug-in. If the scanner is powered off, the autoexposure information is lost.

Autofocus – LS-3510AF only

One of the key features of the LS-3510AF is its focusing and autofocusing features. This eliminates the need for different thickness slide holders, as used by the LS-3500. In almost all cases, the standard autofocus will assure you of the sharpest image possible.

The Autofocus button, shown in Figure 10.9, is only enabled when an LS-3510AF is connected. When this button is clicked, the scanner will attempt to autofocus on the film. If successful, the focus position is placed in the FOCUS value edit box. The scanner may not be able to focus on a slide if it has low contrast or few sharp details. This should be done for every slide. When the AUTO checkbox is checked, the plug-in will automatically perform an autofocus the first time a preview is performed or before the final scan. If the AUTO checkbox is unchecked and checked again, this is reset and another autofocus will be performed before the next preview or final scan.



Figure 10.9 The Autofocus button – Macintosh and Windows.

Manual Focus – LS-3510AF only

In some cases, such as with blurry images or warped film, you may wish to manually focus on an area of the slide. This is easily accomplished by clicking the manual Focus button.

The manual FOCUS control is only enabled when an LS-3510AF is connected. Click the FOCUS button, shown in Figure 10.10, to enter manual focus mode.



Figure 10.10 The manual FOCUS button – Macintosh and Windows.

While in this mode, the FOCUS button will change to a STOP button, as shown in Figure 10.11.



Figure 10.11 The manual focus STOP button – Macintosh and Windows.

If you move the mouse over the preview area, you will see that it becomes a magnifying glass with crosshairs in the center. Place this cursor over the area you wish to focus on, then click the mouse button.

The scanner will take a small high-resolution grayscale scan and display it in the preview area. You may then adjust the focus by using the slider, which has now become active, or the FOCUS value edit box, which can contain a value between 0 and 48. Most focus settings are in the area of 24 for slides mounted in plastic.

Performing a Preview Scan

There are several scanning parameters which you can change that affect the outcome of the preview scan. Each of these is controlled through the Scan dialog and the Gamma Curve Editor dialog boxes, as indicated in Table 10.1.

<u>Parameter</u>	<u>Dialog Box</u>	<u>Described In</u>
Film Type	Scan	Chapter 12
Image Orientation	Scan	Chapter 12
Auto Exposure	Scan	Chapter 13
Brightness	Scan	Chapter 13
Contrast	Scan	Chapter 13
Color Balance	Scan	Chapter 13
Gamma Curves	Gamma Editor	Chapter 16

Table 10.1 Parameters affecting the preview scan.

Conversely, the preview scan is also controlled by preset parameters that you cannot change. These include position, width, height and resolution. These are all discussed in Chapter Eleven of this manual.

Once the preview scan is finished, you can view the image, adjust the scanning settings, and crop the image in preparation for the final scan.

Performing a Final Scan

Once you are satisfied with the scanning settings, a final scan can be invoked by clicking on the SCAN button. Upon completion of the scan, an image will appear in a window titled "UNTITLED-1."

Saving the Scan

Macintosh: You can then save the resulting scan to disk by pulling down the FILE menu to activate the SAVE AS... dialog, as seen in Figure 10.12. A dialog box will appear prompting you to enter the new file name to be used for the scan. This scan file can be saved in two 24-bit true color file formats, either PICT or TIFF 5.0 file.

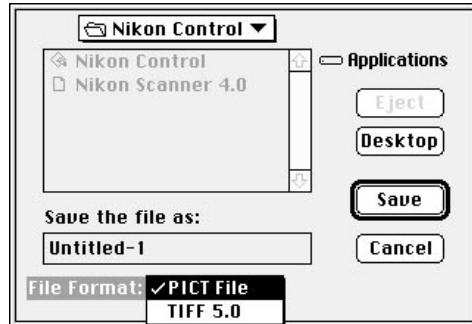


Figure 10.12 The scanned image is saved to a disk file through the SAVE AS... file dialog box – Macintosh.

Windows: You can then save the resulting scan to disk by pulling down the FILE menu to activate the SAVE AS... dialog, as seen in Figure 10.13. A dialog box will appear prompting you to enter the new file name to be used for the scan. This scan file can be stored in two 24-bit true color file formats, either TGA (Targa) or BMP (Windows Bitmap Files).

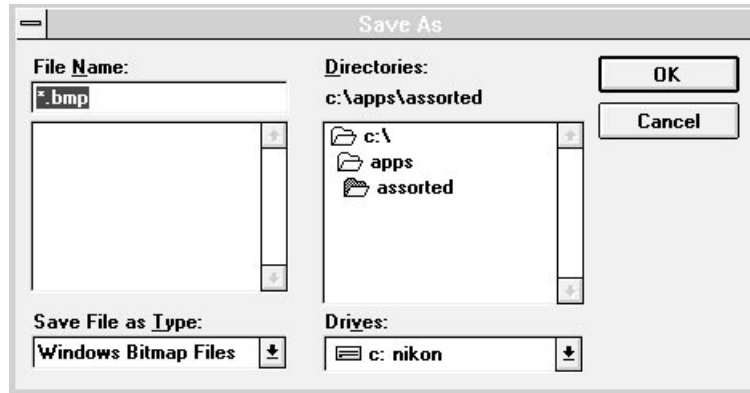


Figure 10.13 The scanned image is saved to a disk file through the SAVE AS... dialog – Windows.

Ejecting the Film (Coolscan only)

Macintosh: The film can be ejected from the scanner by re-running the plug-in and clicking on the EJECT button, or it will automatically eject upon the next scanner power up. It can also be ejected using the *Eject Coolscan Film* application provided with the plug-in software. If you are using System 7.0 or later, you can place this application in the Apple Menu Items folder in your System Folder.



Never use tweezers or other tools to remove a slide.



Eject Coolscan™ Film

Figure 10.14 The Eject Coolscan Film application icon – Macintosh.

Windows: The film can be ejected from the scanner by re-running the plug-in and clicking on the EJECT button, or it will automatically eject upon the next scanner power up. It can also be ejected using the *Eject Coolscan Film* application provided with the plug-in software, or from the DOS command line by typing "Eject."



Never use tweezers or other tools to remove a slide.



Figure 10.15 The Eject Coolscan Film application icon – Windows.

Quitting the Application

Macintosh: The application is terminated through the QUIT command in the FILE pull-down menu, or by simply pressing “⌘” and “Q”.

Windows: The application is terminated through the EXIT command in the FILE pull-down menu, or by simultaneously striking the ALT key and the F4 key.

Cropping and Sizing Images

In many cases you will want to scan only a certain portion of an image. Through an operation called *cropping*, the Nikon Scanner plug-in allows you to select any area of the image for scanning – from the image border to any portion within the border. Cropping is accomplished by using the mouse in combination with the sizing controls found in the Scan dialog, as shown in Figure 11.1a for Macintosh and Figure 11.1b under Windows.

Directly related to the cropping function is the *resolution* of the scan. The resolution setting determines how many pixels will be produced by the scan. The higher the resolution, the greater the scan quality, and the larger the resulting scan file size. You will want to select an appropriate scanning resolution for each image. The objective is to scan an image at the appropriate resolution for your intended use, thus minimizing unnecessarily large file sizes, yet guaranteeing sufficient data for demanding output requirements.

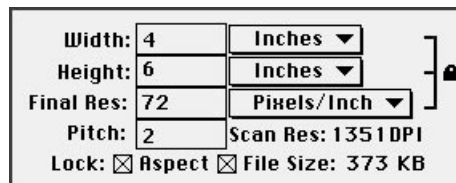


Figure 11.1a Sizing controls in Scan dialog – Macintosh.

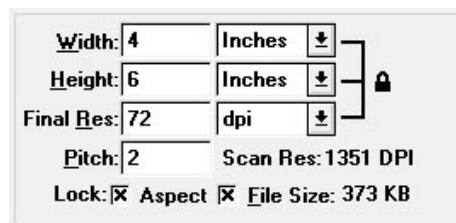


Figure 11.1b Sizing controls in Scan dialog – Windows.

The Sizing Controls

The sizing controls consist of the WIDTH, HEIGHT, FINAL RESOLUTION, and PITCH. For convenience, you can choose to lock the ASPECT (the proportions of the image) or the FILE SIZE. Locking the ASPECT ensures that the resulting scan will retain

the proportions that you have set, regardless of the changes you make in crop *size*. You might also wish to constrain the *file size* of scans. The scan resolution (measured in dots per inch, or dpi) is controlled by the `PITCH` setting. The lower the `PITCH` setting, the higher the resolution of the scan, and the larger the resulting scan file size. The effects of the `WIDTH` and `HEIGHT` settings are reflected in the preview image window by the white crop rectangle. The crop rectangle encloses the area to be scanned. The size of the crop rectangle will change in accordance with changes to the `WIDTH` and `HEIGHT` values. Likewise, these values will change in accordance with changes to the size of the crop rectangle, via the cursor.

The Preview Window

As you have seen, the preview scan is displayed in the image portion of the preview window. The cursor provides graphical control of the crop rectangle when it is moved within this window. Graphical control of the crop rectangle is explained in this chapter, in the section “Crop Rectangle.”

The orientation of the preview window, portrait or landscape, depends on the status of the orientation button, as shown in Figure 11.2.

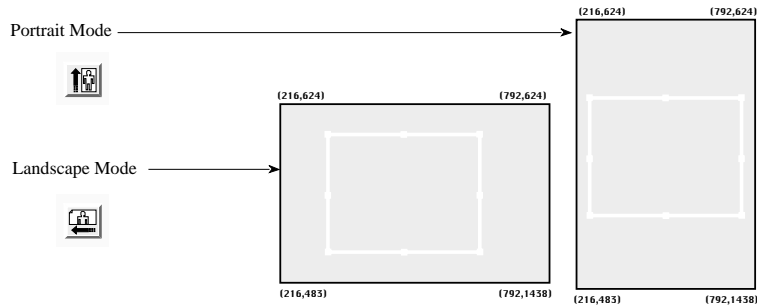


Figure 11.2 Portrait and Landscape orientation of the preview window.

Width

The `WIDTH` setting, as seen in Figure 11.3a for Macintosh and Figure 11.3b under Windows, determines the horizontal dimension of the final scan. This assumes that the film orientation is correctly selected for the image to be scanned.



Figure 11.3a The `WIDTH` setting – Macintosh.



Figure 11.3b The WIDTH setting – Windows.

Height

The HEIGHT setting, as shown in Figure 11.4 for Macintosh and Figure 11.4b under Windows, determines the horizontal dimension of the final scan. Again, this assumes that the film orientation is correctly selected for the image to be scanned.



Figure 11.4a The HEIGHT setting – Macintosh.



Figure 11.4b The HEIGHT setting – Windows.

Width and Height Units

The units of measure for width and height are selectable. They can be defined as pixels, inches, cm, mm, picas or points. This is shown in Figure 11.5.



Figure 11.5 Selecting the units of measure for WIDTH or HEIGHT – Macintosh and Windows.

Final Resolution

The FINAL RESOLUTION determines the number of pixels per unit area in the final scan, or the *output resolution*. The value of this setting will determine the scan PITCH. For example, if you decide that you want a FINAL RESOLUTION of 300 pixels per inch, or ppi, the PITCH setting will automatically be set to scan at the appropriate setting, or *input resolution*.

The important point to understand for now is that the FINAL RESOLUTION is directly related to the scan PITCH and the WIDTH and HEIGHT measurements.

Final Resolution Units

Macintosh: The units of measure for the FINAL RESOLUTION can be in pixels per inch, pixels per cm, or pixels per mm. Typically, the inch, cm or mm units of measure selected will correspond to the WIDTH and HEIGHT units. Selection of the units of measure for this setting is shown in Figure 11.6a.



Figure 11.6a Selecting the units of measure for FINAL RESOLUTION – Macintosh.

Windows: The units of measure for the FINAL RESOLUTION can be in dots per inch, dots per cm, or dots per mm. Typically, the inch, cm or mm units of measure selected will correspond to the WIDTH and HEIGHT units. Selection of the units of measure for this setting is shown in Figure 11.6b.



Figure 11.6b Selecting the units of measure for FINAL RESOLUTION – Windows.

Scan Pitch

The scan PITCH is a number that determines the input resolution of a scan. The lower the PITCH number, the higher the quality of the resulting scan. The PITCH setting essentially instructs the scanner on how to set the film scanning stage mechanism inside the scanner. It refers to the pitch of the lead screw mechanism that drives the film stage. The higher the pitch number, the more the stage moves for every scan line and the lower the resulting resolution.



Figure 11.7 The scan PITCH setting – Macintosh and Windows.

Scan Resolution Status

The SCAN RESOLUTION status, shown in Figure 11.8, is based on the scan PITCH. Think of it as the dots per inch equivalent of the PITCH setting. The value of this item will change as the scan PITCH changes.

Scan Res: 450 DPI

Figure 11.8 The SCAN RESOLUTION status.

Locking the Aspect

Macintosh: As noted in the beginning of this chapter, it is possible to lock the aspect ratio, or proportions of a crop rectangle. If the LOCK ASPECT check box is checked, as shown in Figure 11.9a, the WIDTH and HEIGHT values can change, but the ratio cannot.

Lock: Aspect

Figure 11.9a The LOCK ASPECT box in active state – Macintosh.

Windows: As noted in the beginning of this chapter, it is possible to lock the aspect ratio, or proportions of a crop rectangle. If the LOCK ASPECT check box is checked, as shown in Figure 11.9b, the WIDTH and HEIGHT values can change, but the ratio cannot.

Lock: Aspect

Figure 11.9b The LOCK ASPECT box in active state – Windows.

Locking the File Size

Macintosh: We also noted earlier that you may wish to constrain the file size of scans. If the LOCK FILE SIZE box is checked, the WIDTH, HEIGHT, and FINAL RESOLUTION values can change, but the ratio cannot.

File Size: 279 KB

Figure 11.10a The LOCK FILE SIZE box in active state – Macintosh.

Windows: We also noted earlier that you may wish to constrain the file size of scans. If the LOCK FILE SIZE box is checked, the WIDTH, HEIGHT, and FINAL

RESOLUTION values can change, but the ratio cannot.

File Size: 279 KB

Figure 11.10b The LOCK FILE SIZE box in active state – Windows.

File Size Status

The FILE SIZE status, shown in Figure 11.11, indicates how large the resulting final scan will be if executed using the current WIDTH, HEIGHT and FINAL RESOLUTION settings. The value of this item will change as these settings are changed.

File Size: 279 KB

File Size: 279 KB

Figure 11.11 The FILE SIZE status – Macintosh and Windows.

The Preview Window

The preview window consists of the preview image, pixel coordinates of the crop rectangle, and the crop rectangle itself. These components, in the landscape mode, are shown in Figure 11.12.

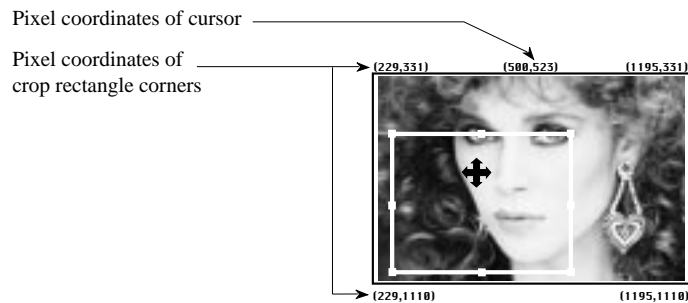


Figure 11.12 The components of the preview window in landscape mode.

The preview window is also present in the Gamma Curve Editor dialog box. However, no crop rectangle is present, although the rectangle of the preview window is used to contain data for the autocontrast button.

When manipulating the exposure controls in the Gamma Curve Editor dialog box, approximations of the results can be viewed in the preview window. This provides you with direct feedback regarding the manipulation of the color controls.

The size of the preview image depends on the screen resolution of your monitor:

Macintosh:

Resolution	Monitor Size	Preview Width	Preview Height
512 x 384	9 - 12 inch	127 pixels	190 pixels
640 x 480	13 - 14 inch	200 pixels	300 pixels
832 x 624	16 - 21 inch	470 pixels	705 pixels

Table 11.1a Monitor resolution and preview sizes – Macintosh.

If no preview image is available when the Scan dialog is invoked, a black preview area is displayed. Preview images are saved in the Nikon Scanner plug-in preferences file, located in your preferences folder. If a preview was present when the plug-in was last closed, it will appear the next time you open the plug-in. You can dispose of the previous preview by clicking the RESET button or performing a new preview.

Windows:

Resolution	Font Size	Preview Size	Dialog Size
640 x 480	Small	300 x 200	Small
800 x 600	Small	486 x 324	Large
800 x 600	Large	389 x 260	Small
1024 x 768	Large	556 x 371	Large

Table 11.1b Monitor resolution and preview sizes – Windows.

If no preview image is available when the Scan dialog is invoked, a black preview area is displayed.

Crop Rectangle

As seen in Figure 11.13, the preview window may also contain a crop rectangle. The crop rectangle provides a graphical means of selecting the area desired for the final scan. By adjusting the size and location of the crop rectangle you can see and select exactly what image data will be included in the final scan. This selected scanning area is contained within the crop rectangle.



Macintosh only: The entire preview area can be selected by holding down the “⌘”

key and striking the “A” key.



Windows only: The entire preview area can be selected by double-clicking in the preview area.

The crop rectangle reflects the combined settings of WIDTH, HEIGHT and FINAL RESOLUTION. You can change the width and height of the crop rectangle by altering their respective settings in the sizing dialog. Alternatively, you can modify the width and height, or reposition the crop rectangle graphically using the mouse.

A typical crop rectangle in a landscape mode preview window is shown in Figure 11.13.

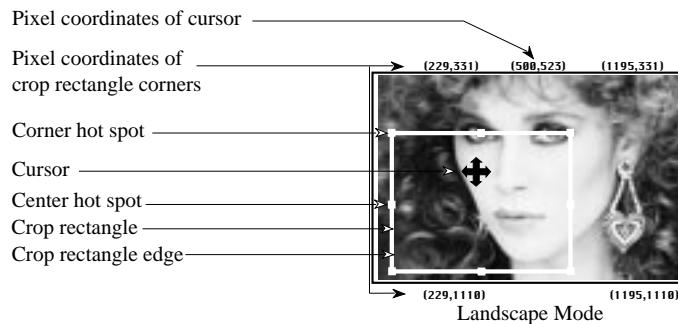


Figure 11.13 The crop rectangle in landscape mode.

The crop rectangle is seen to consist of a white rectangle with eight *hot spots* surrounding it. The hot spots located at the four corners of the rectangle are called *corner hot spots*. The other four hot spots, located at the centers of the rectangle's sides are called the *center hot spots*.

The shape of the cursor varies depending on where it is located within the preview window. If the cursor is located over the image area *and* within the crop rectangle, it is displayed as a four-arrow cursor, as shown in Figures 11.13 and 11.14. The coordinates of the cursor are shown just above the center of the preview window. Notice that as you move the cursor within the crop rectangle the value of the coordinates changes accordingly. You can reposition the crop rectangle without resizing it by clicking and dragging the mouse when the four-arrow cursor is displayed.

When the cursor is located over the image area, but *not* within the crop rectangle, or if no crop rectangle exists, the cursor is displayed as a crosshair, as seen in Figure 11.15. The appearance of the crosshair cursor indicates that a new crop rectangle will be drawn if the mouse is clicked and dragged. Any existing crop rectangle will be deleted whenever a new crop rectangle is created. The color of the crosshair changes to provide contrast with the image. For example, if the cursor is located over a black or dark

area, the cursor will change to a light color, and vice versa in white or light areas.



Figure 11.14 Four-arrow cursor.



Figure 11.15 Crosshair cursor.

If the cursor is located such that it is positioned on one of the corner or center hot spots, the cursor is displayed as an arrow, shown in Figure 11.16.



Figure 11.16 Arrow cursor.

You can modify the size of the crop rectangle by clicking and dragging one of the hot spots in any direction. Clicking and dragging a center hot spot moves the side of the crop rectangle corresponding to that hot spot. Likewise, an edge hot spot moves both sides corresponding to that hot spot.

Changes to the width and height of the crop rectangle are reflected in the WIDTH and HEIGHT value boxes. If, however, the ASPECT or FILE SIZE lock boxes are active, the PITCH will change to maintain them.

Coordinate Display

The location coordinates of the four corners of the preview image are seen at the four corners of the crop rectangle, as seen in Figure 11.13. The scanner's coordinate array system reflects the corner values, in pixels, of the image area.

The Sizing Controls

The sizing controls, used in conjunction with the crop rectangle in the preview image specify the spatial parameters (height, width, and image area) of the scan. This relationship is illustrated, for example, in Figure 11.17a for Macintosh, and in Figure 11.17b for Windows.

In this example, a final resolution of 72 pixels per inch is desired in an image that is 4 inches wide by 6 inches high. These are the output dimensions and resolution. It is typically easier to specify the dimensions with respect to the resulting scan. For example, one would know that the result needs to fit in a 4" x 6" frame on a page. Similarly, the final (or output) resolution will be dictated by the printer. These output dimensions

translate directly to the PITCH and SCAN RESOLUTION input settings. The input and output settings are directly related. Changing one necessarily changes the other.

(a) Sizing text entry dialog

Width:	4	Inches
Height:	6	Inches
Final Res:	72	Pixels/Inch
Pitch:	4	Scan Res: 675 DPI
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 364.5 KB

(b) Preview image

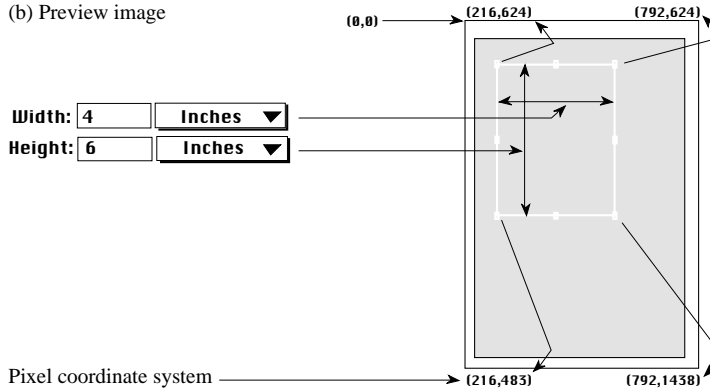


Figure 11.17a The controls associated with sizing - Macintosh. (a) The sizing text dialog items. (b) The preview image window.

(a) Sizing text entry dialog

Width:	4	Inches	↓
Height:	6	Inches	↓
Final Res:	72	dpi	↓
Pitch:	4	Scan Res: 676 DPI	
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 124 KB	

(b) Preview image

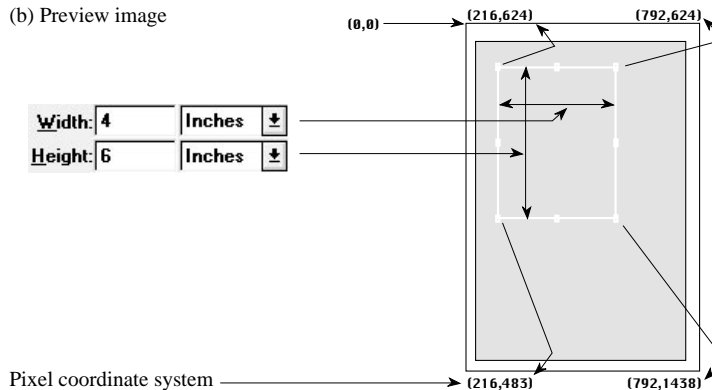


Figure 11.17b The controls associated with sizing - Windows. (a) The sizing text dialog items. (b) The preview image window.

Dimensional Units

As you learned in a previous section, the width and height units of measure can be specified as pixels, inches, cm, mm, picas, or points, depending on your preference. For **Macintosh**, the final resolution units can be specified as pixels per inch, pixels per cm, or pixels per mm. For **Windows**, the resolution units can be specified as dots per inch, dots per cm, or dots per mm. Note that dots and pixels are functionally the same. Typically, the width and height are specified in the same units of measure. The final resolution uses either inches, cm or mm, based on the selection of units of measure for the width and height.

Resolution and Scan Pitch

Resolution is a measure of the amount of data per unit area. The units are *pixels*. The unit measure is either inches, cm's or mm's. This is called *Final Res*, short for final resolution.

Most users prefer to define output resolution. Before the scan is made, the

dimensions of the final image are typically known. For example, when a page layout reserves a 4" x 6" space, a 4" x 6" scanned image is produced to fit.

The resolution of the scan, either input or output, will determine the amount of data that is present in the scan, e.g. the amount of data in the 4" x 6" area. If the output resolution was set at 100 pixels or dots per inch, the resulting scan file would be $(4 \times 100) \times (6 \times 100) = 240,000$ pixels or dots. If the output resolution was set at 200 pixels or dots per inch, the resulting file would be $(4 \times 200) \times (6 \times 200) = 960,000$ pixels or dots. Both images would still, however, occupy the same 4" x 6" space when used at their respective resolution settings.

So what is the basis for selecting resolution? The higher the resolution, the better the scan detail, the longer it takes to produce the scan, and the larger the resulting file size. Typically, the resolution of the scan is selected to best suit its intended use, in particular the device it will be output on. To match any output device that has 300 dots per inch, the final resolution might be selected to be 300 pixels per inch.

This simple rule does not necessarily apply for all applications. For example, when your intended output is for offset or printed reproduction, the scan resolution should be between one and two times the required printing *screen* resolution.

Final Resolution

Macintosh: Final resolution is measured in either pixels/inch (ppi), pixels/mm or pixels/cm. As you learned in the previous chapter, the number of pixels in the final scan will equal the value of this parameter multiplied by the width and the height values.

The resulting SCAN RESOLUTION and PITCH setting of using 72, 144 and 288 ppi FINAL RESOLUTION settings are shown in Figure 11.18a. The WIDTH and HEIGHT remain constant. Note, however, that the scan PITCH, the SCAN RESOLUTION and the FILE SIZE vary accordingly.

(a) 72 ppi final resolution	<table border="1"> <tr><td>Width:</td><td>4</td><td>Inches ▼</td></tr> <tr><td>Height:</td><td>6</td><td>Inches ▼</td></tr> <tr><td>Final Res:</td><td>72</td><td>Pixels/Inch</td></tr> <tr><td>Pitch:</td><td>4</td><td>Scan Res: 675 DPI</td></tr> <tr><td>Lock:</td><td><input type="checkbox"/> Aspect</td><td><input type="checkbox"/> File Size: 364.5 KB</td></tr> </table>	Width:	4	Inches ▼	Height:	6	Inches ▼	Final Res:	72	Pixels/Inch	Pitch:	4	Scan Res: 675 DPI	Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 364.5 KB
Width:	4	Inches ▼														
Height:	6	Inches ▼														
Final Res:	72	Pixels/Inch														
Pitch:	4	Scan Res: 675 DPI														
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 364.5 KB														
(b) 144 ppi final resolution	<table border="1"> <tr><td>Width:</td><td>4</td><td>Inches ▼</td></tr> <tr><td>Height:</td><td>6</td><td>Inches ▼</td></tr> <tr><td>Final Res:</td><td>144</td><td>Pixels/Inch</td></tr> <tr><td>Pitch:</td><td>2</td><td>Scan Res: 1351 DPI</td></tr> <tr><td>Lock:</td><td><input type="checkbox"/> Aspect</td><td><input type="checkbox"/> File Size: 1.4 MB</td></tr> </table>	Width:	4	Inches ▼	Height:	6	Inches ▼	Final Res:	144	Pixels/Inch	Pitch:	2	Scan Res: 1351 DPI	Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 1.4 MB
Width:	4	Inches ▼														
Height:	6	Inches ▼														
Final Res:	144	Pixels/Inch														
Pitch:	2	Scan Res: 1351 DPI														
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 1.4 MB														
(c) 288 ppi final resolution	<table border="1"> <tr><td>Width:</td><td>4</td><td>Inches ▼</td></tr> <tr><td>Height:</td><td>6</td><td>Inches ▼</td></tr> <tr><td>Final Res:</td><td>288</td><td>Pixels/Inch</td></tr> <tr><td>Pitch:</td><td>1</td><td>Scan Res: 2702 DPI</td></tr> <tr><td>Lock:</td><td><input type="checkbox"/> Aspect</td><td><input type="checkbox"/> File Size: 5.7 MB</td></tr> </table>	Width:	4	Inches ▼	Height:	6	Inches ▼	Final Res:	288	Pixels/Inch	Pitch:	1	Scan Res: 2702 DPI	Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 5.7 MB
Width:	4	Inches ▼														
Height:	6	Inches ▼														
Final Res:	288	Pixels/Inch														
Pitch:	1	Scan Res: 2702 DPI														
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 5.7 MB														

Figure 11.18a (Macintosh) Changing the FINAL RESOLUTION affects scan PITCH, SCAN RESOLUTION and FILE SIZE. (a) 72 ppi FINAL RESOLUTION. (b) 144 ppi FINAL RESOLUTION. (c) 288 ppi FINAL RESOLUTION.

Windows: Final resolution is measured in either pixels/inch (ppi), pixels/mm or pixels/cm. As you learned in the previous chapter, the number of pixels in the final scan will equal the value of this parameter multiplied by the width and the height values.

The resulting SCAN RESOLUTION and PITCH setting of using 72, 144 and 288 dpi FINAL RESOLUTION settings are shown in Figure 11.18b. The WIDTH and HEIGHT remain constant. Note, however, that the scan PITCH, the SCAN RESOLUTION and the FILE SIZE vary accordingly.

(a) 72 dpi final resolution	<table border="1"> <tr><td>Width:</td><td>4</td><td>Inches</td><td>↓</td></tr> <tr><td>Height:</td><td>6</td><td>Inches</td><td>↓</td></tr> <tr><td>Final Res:</td><td>72</td><td>dpi</td><td>↓</td></tr> <tr><td>Pitch:</td><td>4</td><td>Scan Res:</td><td>676 DPI</td></tr> <tr><td>Lock:</td><td><input type="checkbox"/> Aspect</td><td><input type="checkbox"/> File Size:</td><td>124 KB</td></tr> </table>	Width:	4	Inches	↓	Height:	6	Inches	↓	Final Res:	72	dpi	↓	Pitch:	4	Scan Res:	676 DPI	Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size:	124 KB
Width:	4	Inches	↓																		
Height:	6	Inches	↓																		
Final Res:	72	dpi	↓																		
Pitch:	4	Scan Res:	676 DPI																		
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size:	124 KB																		
(b) 144 dpi final resolution	<table border="1"> <tr><td>Width:</td><td>4</td><td>Inches</td><td>↓</td></tr> <tr><td>Height:</td><td>6</td><td>Inches</td><td>↓</td></tr> <tr><td>Final Res:</td><td>144</td><td>dpi</td><td>↓</td></tr> <tr><td>Pitch:</td><td>2</td><td>Scan Res:</td><td>1351 DPI</td></tr> <tr><td>Lock:</td><td><input type="checkbox"/> Aspect</td><td><input type="checkbox"/> File Size:</td><td>497 KB</td></tr> </table>	Width:	4	Inches	↓	Height:	6	Inches	↓	Final Res:	144	dpi	↓	Pitch:	2	Scan Res:	1351 DPI	Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size:	497 KB
Width:	4	Inches	↓																		
Height:	6	Inches	↓																		
Final Res:	144	dpi	↓																		
Pitch:	2	Scan Res:	1351 DPI																		
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size:	497 KB																		
(c) 288 dpi final resolution	<table border="1"> <tr><td>Width:</td><td>4</td><td>Inches</td><td>↓</td></tr> <tr><td>Height:</td><td>6</td><td>Inches</td><td>↓</td></tr> <tr><td>Final Res:</td><td>288</td><td>dpi</td><td>↓</td></tr> <tr><td>Pitch:</td><td>1</td><td>Scan Res:</td><td>2702 DPI</td></tr> <tr><td>Lock:</td><td><input type="checkbox"/> Aspect</td><td><input type="checkbox"/> File Size:</td><td>5.97 MB</td></tr> </table>	Width:	4	Inches	↓	Height:	6	Inches	↓	Final Res:	288	dpi	↓	Pitch:	1	Scan Res:	2702 DPI	Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size:	5.97 MB
Width:	4	Inches	↓																		
Height:	6	Inches	↓																		
Final Res:	288	dpi	↓																		
Pitch:	1	Scan Res:	2702 DPI																		
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size:	5.97 MB																		

Figure 11.18b (Windows) Changing the FINAL RESOLUTION affects scan PITCH, SCAN RESOLUTION and FILE SIZE. (a) 72 dpi FINAL RESOLUTION. (b) 144 dpi FINAL RESOLUTION. (c) 288 dpi FINAL RESOLUTION.

Scan Pitch

There are two types of scan PITCH, *integer* or *non-integer*. The scan PITCH can be any integer or non-integer between 1 and 25.

Integer Pitch, e.g. PITCH = 1, 2, 3, 4, or 5 produces data that is cleaner and scans that are *faster*, but may not be sized to your exact desired dimensions.

Non-integer Pitch, e.g. PITCH = 1.5, 2.233, or 6.1, produces scans that require *interpolation* to reach an exact size. Interpolation is the process by which the Nikon Scanner plug-in reduces the number of pixels to fit the precise resolution requested.

Whenever possible, it is recommended to use Integer Pitch settings. For example, suppose that a desired WIDTH, HEIGHT and FINAL RESOLUTION produces a PITCH of 2.05. In this case, forcing the PITCH to 2.0 while accepting the slight modification to FINAL RESOLUTION results in cleaner and faster scanning, and the final resolution can be adjusted by interpolation in post-processing.

Locking Proportions and File Size

As a convenience, you can lock a scan's proportions and file size. Once you have set the dimensions and resolution, you may want to lock these values so that they cannot be changed inadvertently when cropping the image graphically.

If you select LOCK ASPECT and/or FILE SIZE, a small lock icon will appear to the right of the value edit items. It will have a bar showing how the items are locked together, as shown in Figure 11.19.



Figure 11.19 Icon resulting from locking the ASPECT and FILE SIZE.

There is a strict relationship between the items within the sizing dialog and the crop rectangle displayed in the preview dialog. Changing items in this dialog affects the crop and vice versa. You can lock the ASPECT, keeping the ratio between the crop rectangle's width and height constant, regardless of changes to the output parameters and crop rectangle size. You can also lock the FILE SIZE, keeping the pixel count in the scan, as well as the aspect ratio, constant. This makes it easy to set final dimensions and resolution, while freeing you up to adjust the crop rectangle's position and size without changing the pixel count on the output.

For example, LOCK FILE SIZE will automatically cause the LOCK ASPECT check box to become selected. Deselecting the LOCK ASPECT check box will automatically deselect the LOCK FILE SIZE check box. The results of locking sizing parameters is shown in Figure 11.20a for Macintosh, and in Figure 11.20b for Windows.

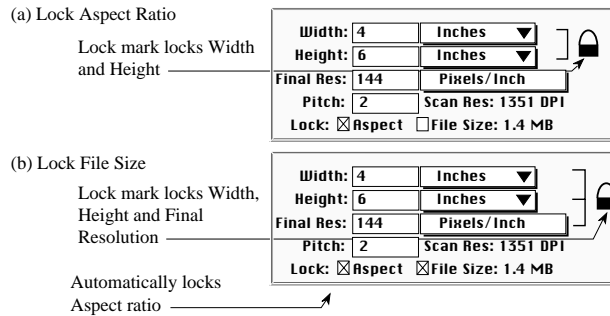


Figure 11.20a Locking sizing parameters - Macintosh. (a) Locking the ASPECT locks the WIDTH and HEIGHT. (b) Locking the FILE SIZE locks the ASPECT and the FINAL RESOLUTION.

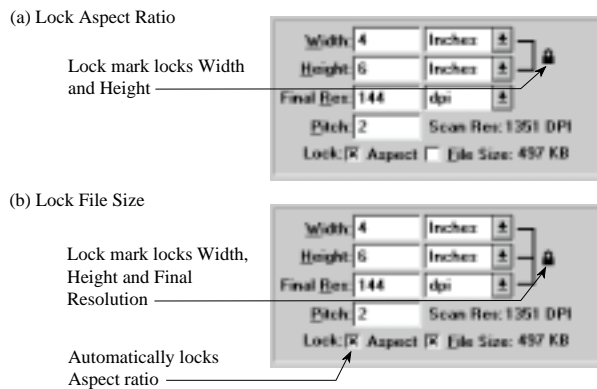


Figure 11.20b Locking sizing parameters - Windows. (a) Locking the ASPECT locks the WIDTH and HEIGHT. (b) Locking the FILE SIZE locks the ASPECT and the FINAL RESOLUTION.

Moving the Crop Rectangle

It is simple to move the crop rectangle to the desired area once the size and resolution are determined. Although not necessary, it is easiest to first lock the FILE SIZE, which automatically locks the ASPECT.

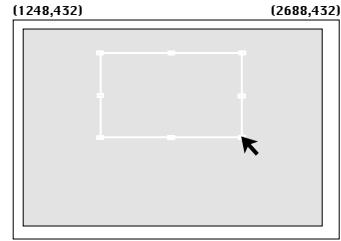
Move the cursor over the preview window and inside the current crop rectangle.

Click and drag the mouse to place the crop rectangle in the desired position. Since the locks are in effect, no dimensional changes are possible.

If the locks are not in effect, the same technique can be used, although a slip of the mouse could cause resizing of the crop rectangle.

(a) Crop rectangle

Width:	5	Inches
Height:	3	Inches
Final Res:	288	Pixels/Inch
Pitch:	1	Scan Res: 2702 DPI
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 3.6 MB



(b) Moving the crop rectangle

Width:	5	Inches
Height:	3	Inches
Final Res:	288	Pixels/Inch
Pitch:	1	Scan Res: 2702 DPI
Lock:	<input type="checkbox"/> Aspect	<input type="checkbox"/> File Size: 3.6 MB

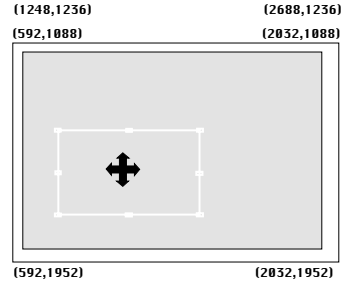


Figure 11.21a Moving the crop rectangle - Macintosh.

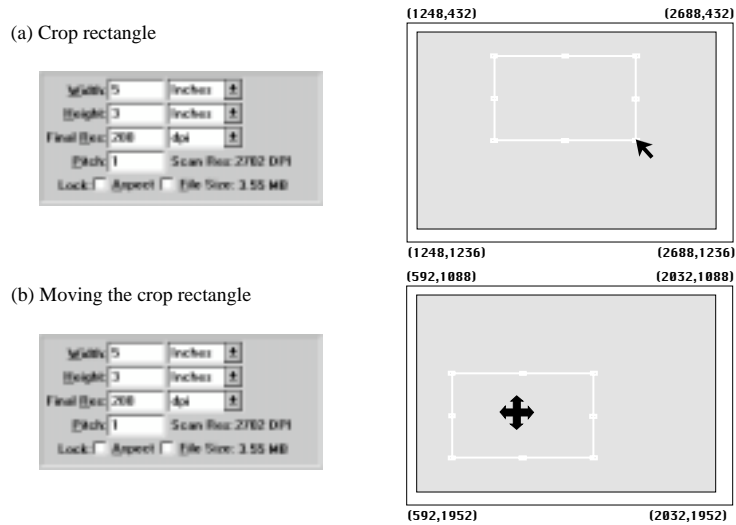


Figure 11.21b Moving the crop rectangle - Windows.

Disk Space Status

Macintosh: A status message indicating the amount of disk space available on the selected disk drive is provided, as shown in Figure 11.22a. This will enable you to confirm whether or not there is enough available disk space to save the scan you are currently working on. So, if the FILE SIZE is greater than the available DISK SPACE, you will need to increase the amount of free disk space before you continue. In any event, you need at least 3 megabytes free on your startup disk (this is the disk that appears in the upper right hand corner of your screen upon system startup) in order for the Nikon Scanner plug-in to save the preview image. The larger main dialogs create larger preview images and a larger Nikon Scanner preferences file.

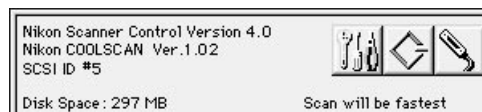


Figure 11.22a Available DISK SPACE status message – Macintosh.

Windows: A status message indicating the amount of disk space available on the selected disk drive is provided, as shown in Figure 11.22b. This will enable you to confirm whether or not there is enough available disk space to save the scan you are currently working on. So, if the FILE SIZE is greater than the available DISK FREE, you will

need to increase the amount of free disk space before you continue. In any event, you need at least 3 megabytes free on your hard disk in order for the Nikon Scanner plug-in to save the preview image. The larger main dialogs create larger preview images and a larger NKNCTRL.INI file.



Figure 11.22b Available DISK SPACE status message – Windows.

Film Type and Orientation

The Image Orientation Controls

There are two types of picture orientation, commonly called portrait and landscape. In order for the image files created by the Nikon Scanner plug-in to be oriented and displayed correctly, the plug-in has to be told the orientation of the image on the film and the film type. Otherwise, it may be necessary to flip the image either horizontally or vertically after the preview scan is executed.

Portrait/Landscape Button in Portrait Mode

The Portrait/Landscape button toggles the image orientation between landscape and portrait modes. When the button is in the portrait mode, it is displayed as seen in Figure 12.1.



Figure 12.1 Portrait/Landscape button in portrait mode.

Portrait/Landscape Button in Landscape Mode

Clicking the mouse on this button when it is in the portrait mode causes the image orientation to rotate 90 degrees into the landscape mode, as shown in Figure 12.2. Clicking the mouse on this button when it is in the landscape mode causes the image orientation to rotate 90 degrees into the portrait mode, and the button's face changes accordingly.

With Coolscan, since the film is always inserted into the scanner slot assuming a portrait mode (narrow side first), a rotation is necessary if the final scan is to be in landscape mode. When a final scan is performed in this landscape orientation, the image data will be rotated during the scan and written to disk correctly as a landscape image.



Figure 12.2 Portrait/Landscape button in landscape mode.

Flip Vertical Button

At times, the film might be inadvertently inserted into the scanner upside-down. This is easily corrected by flipping the image vertically. Clicking the Flip Vertical button, shown in Figure 12.3, flips the image up-side-down vertically. The preview image will reflect this flip, and the subsequent final scan will be in the proper orientation before being saved to disk. No interpolation occurs during this operation, and it is typically very fast.



Figure 12.3 Flip Vertical button.

Flip Horizontal Button

At times, the film might be inadvertently inserted reversed or backwards. This is easily corrected by flipping the image horizontally. Clicking the Flip Horizontal button, shown in Figure 12.4, flips the image left-to-right horizontally. The preview image will reflect this flip, and the subsequent final scan will be in the proper orientation before being saved to disk. Again, no interpolation occurs during this operation, and it is typically very fast.



Figure 12.4 Flip Horizontal button.

Portrait or Landscape

In order for the plug-in to properly display an image, you must insert it into the scanner slot narrow-side first (Coolscan) and select the correct orientation. Incorrectly setting the orientation causes the image to be viewed sideways, i.e. rotated by 90 degrees. This rotation would also be present in the final scan. In the case of Coolscan, 1/6 of the image on either side will be clipped.

As you learned in an earlier chapter, the face of the Portrait/Landscape button indicates the state of the image orientation. The image portion of the preview window indicates this as well, the portrait mode appearing taller and narrower, and the landscape mode appearing wider and shorter.

As long as the image is in the correct orientation prior to scanning, it will be displayed correctly when opened in any other application software. It also bears noting that the image data itself is never affected by changing the orientation. It is merely

transposed within the file and no interpolation occurs in the rotation.

It is possible to leave the orientation incorrect and rotate it later. However, because rotations of large files in an imaging application can be very time consuming, especially for large files, it is recommended that you perform the rotation prior to final scanning.

Film Type

There are four basic film types compatible with all Nikon scanners:

- Color Positive
- Color Negative
- Black and White Positive
- Black and White Negative

Color Positive Film

Color positive film is sometimes called *reversal* film, transparencies, or slides, and is typically mounted in a slide mount. Shining a light through a color positive film produces a 'true' image. In other words, blues in the image appear blue on the film. Blacks in the image appear opaque on the film.

Color Negative Film

Color negative film, sometimes called *print film*, is typically unmounted in strips of five or six frames. Shining a light through color negative film produces a 'negative' image. In other words, blues in the image appear orange on the film. Blacks in the image appear transparent on the film.

Color negative film has an orange base tint. This base tint is neutralized during the scanning process.

One should *always* scan negative film using the negative film type setting.

Black and White Positive Film

Black and white positive film is sometimes used. Shining a light through a black and white positive film produces a 'true' image. In other words, blacks in the image appear opaque on the film.

Black and White Negative Film

Black and white negative film is used to make black and white prints. Shining a light through a black and white negative film produces a 'negative' image. In other words, blacks in the image appear transparent on the film.

Changing the Film Type

Macintosh: The FILM TYPE pop-up menu lets you select the film type corresponding to the film being scanned. The FILM TYPE pop-up menu, as it appears in the Scan dialog is seen in Figure 12.5a, displaying the currently selected film type.



Figure 12.5a FILM TYPE pop-up menu, not selected – Macintosh.

You can easily access the different film types by clicking on the selection box portion of the FILM TYPE pop-up menu and holding the mouse button down, as shown in Figure 12.5b.

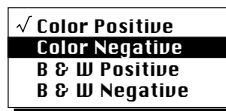


Figure 12.5b FILM TYPE pop-up menu, selected – Macintosh.

The adjacent check mark indicates the currently selected film type. By moving the mouse up and down the menu, without releasing the mouse button, you can select one of the four film types. Indicate the selected type by placing the reverse box over it, then releasing the mouse button. The FILM TYPE button will return to the single line display.

Windows: The FILM TYPE combo box lets you select the film type corresponding to the film being scanned. The FILM TYPE combo box, as it appears in the Scan dialog is seen in Figure 12.6a, displaying the currently selected film type.

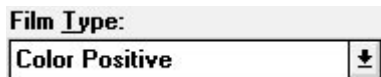


Figure 12.6a FILM TYPE combo box, not selected – Windows.

You can easily access the different film types by clicking on the selection box por-

tion of the FILM TYPE combo box and holding the mouse button down, as shown in Figure 12.6b.

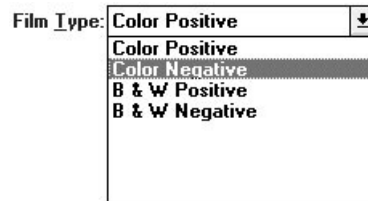


Figure 12.6b FILM TYPE combo box, selected – Windows.

The adjacent check mark indicates the currently selected film type. By moving the mouse up and down the menu, without releasing the mouse button, you can select one of the four film types. Indicate the selected type by placing the reverse box over it, then releasing the mouse button. The FILM TYPE button will return to the single line display.

Contrast, Brightness and Color Balance

The Exposure Controls

The Nikon Scanner plug-in provides a great deal of automatic and manual control over a scan's contrast, brightness, and color balance. Even more accurate control can be achieved using the Gamma Curve Editor, discussed in Chapters Fifteen and Sixteen.

The typical scanning operation involves performing an autoexposure before the preview scan, then implementing minor modifications through the manual controls.

The results of the autoexposure settings are seen in the original preview scan. Changes to the manual contrast, brightness, and color balance controls will be reflected in the preview window image after a short pause. These changes are approximations only. These manual controls have a range of 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. Keep in mind that there is a limited range in which changes to these controls will be reflected accurately in the preview image.

The best application of these controls is to greatly alter the densities and color balance of a scan. For example, if an image is too green, the Green exposure for a color positive can be decreased. Another way to counteract the overall green cast is to increase the Blue and Red exposures by equal amounts. Equal amounts of Blue and Red are equivalent to the same amount of Magenta, which is the complimentary or opposite color to Green, and will neutralize it.



Adding to any value when scanning positives will shift the color in that direction. When scanning negatives, adding to the value removes that color.

Automatic Exposure

The *autoexposure* operation is a powerful tool. All it requires of you is to make sure that the film is in place. After the scanner analyzes the entire area of the film, the resulting values will be used to center the contrast, brightness, and red, green and blue exposures. These values are never seen by the user since they are not reported to the user interface. The ranges provided for these parameters are based upon the results of the autoexposure operation.

It is strongly recommended that you allow the scanner to perform an autoexposure each time it previews a *new* slide since the autoexposure values stored for a badly-exposed slide will prevent a normally-exposed slide from being scanned properly. The *scanner* will store the results of this autoexposure calculation. As long as this film remains in the scanner, these autoexposure settings will remain relevant. As long as the

scanner has power supplied, these temporary settings will remain active until the next autoexposure cycle.

An autoexposure operation can be performed at any time by clicking on the autoexposure button.

Autoexposure Button

After you insert a new slide into the scanner, the Autoexposure button, shown in Figure 13.1, provides a means of forcing an autoexposure operation to occur. Clicking on this button causes the scanner to read the entire film area and automatically make adjustments to the contrast, brightness, and color balance controls.



Figure 13.1 Autoexposure button.

Autoexposure Check Box

The status of the **AUTO** check box indicates whether or not the Nikon Scanner plug-in will perform an autoexposure before the next scan. If the Autoexposure button is not selected, no autoexposure operation will occur before the next scan.



Figure 13.2 AUTO check box in inactive state – Macintosh and Windows.

If the Autoexposure button is selected, an autoexposure operation will occur during the next scan, depending on the status of the Autoexposure check mark.

Autoexposure Check Mark

The presence of the Autoexposure check mark next to the **AUTO** check box, as seen in Figure 13.3, indicates that the plug-in believes that an autoexposure operation has already been performed on the film in the scanner and that it has all of the necessary data to execute the scan. *No* autoexposure operation will occur before the next scan.



Figure 13.3 Autoexposure check mark indicates no autoexposure operation will occur before the next scan – Macintosh and Windows.

If the Autoexposure check mark is *not* present, as seen in Figure 13.4, this indicates that the plug-in does not have autoexposure information on the film presently in the scanner. If the check mark is not present and the Autoexposure check box is checked, an autoexposure operation *will* occur before the next scan.



Figure 13.4 AUTO check box with no Autoexposure check mark indicates an autoexposure will occur before the next scan – Macintosh and Windows.

Brightness

The plug-in's Brightness controls allow you to adjust the overall brightness of the scan.

The correct brightness setting is critical to attaining high-quality scans. This is because the dynamic range of the film is greater than the dynamic range of the imaging system, requiring tonal compression in the software.

It should be noted that the brightness control also has a global effect across the entire scan. As with contrast, accurate local control can be attained by modifying the gamma curves, which will be discussed in the following chapters.

For example, increasing brightness is a good way of increasing the overall readability of an underexposed image. Essentially, it allows more light through the film. However, care must be exercised when increasing the brightness, especially if there are large bright areas (highlights) in the film. If strong highlights are present and the brightness control is boosted, these areas might *saturate* (overexpose, or 'wash out') reducing or eliminating detail in these areas.

Similarly, problems can occur if the brightness is reduced to provide increased definition in the highlights. This can cause information in the shadows to be further underexposed, causing a loss of detail in these regions.

The approximate results of changing the brightness can be seen while the preview image is on the screen. However, as you have learned here, care should be taken when performing these adjustments.

Adjusting Brightness

Macintosh: The Brightness button in the Scan dialog, the white circle with the small lines radiating from it, enables you to set the brightness value either through the associated Brightness value edit box or Brightness slider. The Brightness value edit box can be changed by clicking in the box and entering the new value. The Brightness value can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. Clicking on the

Brightness button without releasing it invokes the Brightness slider, as shown in Figure 13.5a, which allows you to drag a white slider control to select the brightness value.

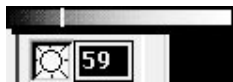


Figure 13.5a The Brightness slider control in the Scan dialog – Macintosh.

Windows: The Brightness button in the Scan dialog, the circle with the small lines radiating from it, enables you to set the brightness value through the associated Brightness value edit box. The Brightness value edit box can be changed by clicking in the box and entering the new value. The Brightness value can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF.

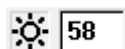


Figure 13.5b The Brightness value edit box in the Scan dialog – Windows.

Contrast

The Nikon Scanner plug-in's contrast controls allow you to adjust the overall contrast of a scan. *Decreasing* the contrast is equivalent to darkening the highlights (lightest areas) at the same time as the shadows (darkest areas) are lightened. *Increasing* the contrast is equivalent to lightening the highlights while darkening the shadows.

Using the correct contrast setting when scanning is critical to achieving good results. This is because the *dynamic range* of film is greater than the dynamic range of the scanner. That is, the film contains a wider range of densities than is reproducible by the imaging system. This is the case for *any* digital imaging system.

It should be noted that the contrast control is a *global* tone control, meaning it will effect the entire scan, not just certain densities. Accurate *local* tone control, affecting only highlights, midtones, or shadows, can be achieved by modifying the *gamma curves*. Modifying the gamma curves is discussed in Chapters Twelve and Thirteen.

For example, suppose that the darkest subject in a photo is not very dark. Further, the lightest subject in the photo is not very bright. All of the information in this photo therefore resides in the midtones (the tonal values located approximately halfway between the highlights and shadows). One way to increase the readability of the image is to increase the contrast by darkening the shadows and lightening the highlights.

As an opposite example, suppose that the photograph has very high contrast, i.e. very bright highlights and dark shadows. If the contrast is reduced, it may be easier to reproduce later on paper.

The approximate results of changing the contrast can be seen while the preview image is on the screen. However, as you have learned here, care should be taken when performing these adjustments.

Adjusting Contrast

Macintosh: The plug-in's Contrast button, the half-black, half-white circle in the Scan dialog, allows you to set the contrast value either through the associated Contrast value edit box or Contrast slider control. The Contrast value edit box can be changed by clicking in the box, or Tabbing into it, and entering the new value. The contrast value can range from -15 to +15. Clicking on the Contrast button without releasing it invokes the Contrast slider, shown in Figure 13.6a, which allows you to drag a white slider control to select the contrast value.



Figure 13.6a The Contrast slider control in the Scan dialog – Macintosh.

The Brightness control, and Red, Green and Blue exposure controls function in the same manner as the Contrast control. You can enter a number directly into the value edit box associated with each control or you can use the associated slider controls. Again, to access the slider controls, click-and-hold the selected button down and move the mouse left and right to change the graphical position of the marker in the slider bar.

Windows: The plug-in's Contrast button, the half-black, half-white circle in the Scan dialog, allows you to set the contrast value through the associated Contrast value edit box. The Contrast value edit box can be changed by clicking in the box, or tabbing into it, and entering the new value. The contrast value can range from -15 to +15.



Figure 13.6b The Contrast value edit box in the Scan dialog – Windows.

The Brightness control, and Red, Green and Blue exposure controls function in the same manner as the Contrast control. Enter a number directly into the value edit box associated with each control.

Color Balance

The *primary colors* used in scanners are red, green and blue. The Nikon Scanner plug-in's Red, Green and Blue Exposure controls enable you to directly affect the exposure time of each of the red, green and blue cycles of a scan. Increasing the red exposure is equivalent to turning up the brightness of the red light without changing the green or blue brightness. In a scanner, however, the light is not actually turned up, but rather the exposure time is increased. The effect though, is similar.

Unlike the brightness or contrast, the color controls affect one primary color at a time. However, changing a color exposure affects the overall color balance. The reason is that when a single primary color is reduced, the two other primary colors appear to be increased. For example, if red is decreased, the image appears to become more cyan. Cyan is the combination of blue and green, and is the inverse color of red. Even though the blue and green exposure values were not changed, the image may appear as if these were changed.

Simulations of the results from modifying the color controls can be seen in the preview image as the controls are modified. There is a practical range of available simulation. Your changes may not be properly reflected in the preview if you are too close to either end of the adjustment range (25-100 for Coolscan, 0 to 255 for LS-3510AF or LS-3500).

Like the brightness control, the color controls affect the entire range of the color. For example, changing the red intensity lightens the red shadows, midtones and highlights by the same amount. More accurate local control can be achieved by modifying the gamma curves, discussed in Chapters Fifteen and Sixteen.

Care must be exercised when modifying colors, as undesirable results can occur. It should also be noted that the monitor calibration and ambient light in the room can affect your results. For example, if your monitor is calibrated such that what should be a neutral gray appears to be red, you might decrease the red exposure of a scan to attain gray on the monitor. Yet, this would be inaccurate if the printer was properly color calibrated. The resulting printout would be red 'starved,' causing the image to have a cyan cast.

Macintosh only: The inverse colors of red, green and blue are cyan, magenta and yellow, respectively. Consequently, the slider controls above each of the Red, Green and Blue Exposure buttons range from the inverse color to the primary color. For example, the red slider ranges from cyan to red. The green slider ranges from magenta to green, and the blue slider ranges from yellow to blue. Use of these controls is explained in the next sections.

Red Exposure

Macintosh: The Red Exposure button, the button labeled R in the Scan dialog, lets you select the amount of red exposure in the image either through the associated

Red value edit box or through the Red/Cyan slider. The Red value edit box can be changed by clicking in the box and entering the next value. The 'redness' values can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. Clicking on the Red button without releasing it invokes the Red slider, as shown in Figure 13.7a, which allows you to drag a white slider control to select the red/cyan value.



Figure 13.7a The Red slider control in the Scan dialog – Macintosh.

Windows: The Red Exposure value edit box, adjacent to the R in the Scan dialog, lets you specify the amount of red exposure in the image. The Red value edit box can be changed by clicking in or tabbing into the box and entering the next value. The 'redness' values can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. This action is shown in Figure 13.7b.



Figure 13.7b The Red value edit box in the Scan dialog – Windows.

Green Exposure

Macintosh: The Green Exposure button, the button labeled G in the Scan dialog, lets you select the amount of green exposure in the image either through the associated Green value edit box or through the Green/Magenta slider. The Green value edit box can be changed by clicking in the box and entering the next value. The 'greenness' values can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. Clicking on the Green button without releasing it invokes the Green slider, as shown in Figure 13.8a, which allows you to drag a white slider control to select the green/magenta value.



Figure 13.8a The Green slider control in the Scan dialog – Macintosh.

Windows: The Green Exposure value edit box, adjacent to the G in the Scan dialog, lets you specify the amount of green exposure in the image. The Green value edit box can be changed by clicking in or tabbing into the box and entering the next value.

The 'greenness' values can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. This action is shown in Figure 13.8b.



Figure 13.8b The Green value edit box in the Scan dialog – Windows.

Blue Exposure

Macintosh: The Blue Exposure button, the button labeled **B** in the Scan dialog, lets you select the amount of blue exposure in the image either through the associated Blue value edit box or through the Blue/Yellow slider. The Blue value edit box can be changed by clicking in the box and entering the next value. The 'blueness' values can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. Clicking on the Blue button without releasing it invokes the Blue slider, as shown in Figure 13.9a, which allows you to drag a white slider control to select the blue/yellow value.



Figure 13.9a The Blue slider control in the Scan dialog – Macintosh.

Windows The Blue Exposure value edit box, adjacent to the **B** in the Scan dialog, lets you specify the amount of blue exposure in the image. The Blue value edit box can be changed by clicking in or tabbing into the box and entering the next value. The 'blueness' values can range from 25 to 100 for Coolscan, and 0 to 255 for LS-3510AF. This action is shown in Figure 13.9b.



Figure 13.9b The Blue value edit box in the Scan dialog – Windows.

Focusing with Coolscan



This chapter applies to Coolscan scanners only. Please proceed to the next chapter if you are using a model LS-3510AF scanner, which features automatic focusing.

Focus Controls

Coolscan has a self-centering mechanism that automatically positions the film into the center of its focal region, also called its 'depth of field.' This applies to film in the film strip holder and film mounted in slide mounts. This assumes, however, that the film is mounted in the center of the mount's thickness. It also assumes that the slide mount thickness can be accommodated by the scanner.

Even with Coolscan's automatic focusing operations, it will sometimes be necessary to fine focus the scanner to achieve optimum results. The focus wheel on the front panel of the scanner allows you to fine focus in two different ways.

The first involves viewing an indicator during a scan. This is called the *Metered Focus* method. As Coolscan examines the film, you can adjust the focus wheel on the front of the scanner. The object is to adjust the focus until the meter shows the maximum possible level. A solid line indicates the highest meter level for that focus session. At this point, the scanner is focused. No image is displayed during this focus operation.

The second focusing technique, called *Visual Focus*, involves positioning the cursor over the preview window, at which point a magnifying glass cursor appears. By positioning this cursor over the region of interest and clicking the mouse button Coolscan will perform a constant high-resolution scan in the area you have selected. As you change the focus control, you can see the results in the preview window. You can easily determine the proper focus by selecting an area that contains high contrast, such as the edge of an object in your slide. Clicking the STOP button ends the focus session.



To realize the maximum optical definition Coolscan is capable of, always insert the film into the scanner with its emulsion side facing upwards.

Selecting the Focus Method (Macintosh only)

The focus method is specified in the Tools dialog. To access the Tools dialog, click on the Tools button (the button with the little wrench, screwdriver, and pliers) in the Main Scan dialog. The state of the SCANNING FOCUS selection box in this dialog determines the currently active focusing method. The default setting is the Metered Focus method, indicated by the lack of a check mark in the SCANNING FOCUS check box. Conversely, the Visual Focus method is indicated by having a check mark in the SCANNING FOCUS check box.

Metered Focus Method

Click on the FOCUS button in the Scan dialog, as seen in Figure 14.1. This initiates the Metered Focus method. This will prompt the appearance of the Focus Level Meter.



Figure 14.1 The Focus button – Macintosh and Windows.

Focus Level Meter

The Focus Level Meter dialog, seen in Figure 14.2, should now appear on your screen. You can now adjust the focus wheel on the front of the scanner. As the wheel is moved you can see the resulting changes to the meter on your screen. As Coolscan repetitively scans the selected spot, the Focus Level Meter's movements indicate the results of a focus measure. The meter value, indicated by the black bar, indicates the sharpness of focus. The optimal focus is achieved by positioning the meter indicator as far to the right as possible.

Remember, the best focus that Coolscan can achieve is dependent on the sharpness of the image. Some images may not contain sharp details to focus on. In such cases, focus on the grain of the film using the Visual Focus method.

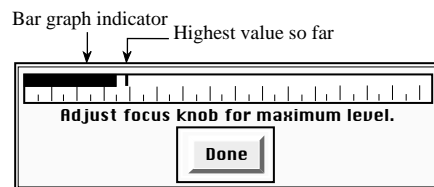


Figure 14.2 The Focus Level Meter dialog.

A summary of the Metered Focus method is illustrated in Figure 14.3a for Macintosh and Figure 14.3b under Windows.

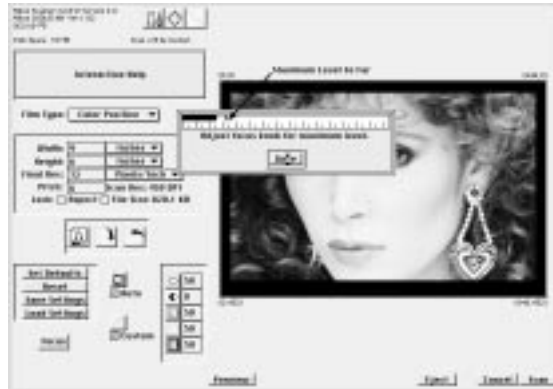


Figure 14.3a (Macintosh) The Scan dialog in the Metered Focus mode. The user clicks on the FOCUS button. The cursor is then placed in the preview window and clicked on the area to be focused on. A meter bar is displayed allowing the user to adjust the focus until the maximum level is indicated.



Figure 14.3b (Windows) The Scan dialog in the Metered Focus mode. The user clicks on the FOCUS button. The cursor is then placed in the preview window and clicked on the area to be focused on. A meter bar is displayed allowing the user to adjust the focus until the maximum level is indicated.

Clicking the DONE button exits the focus operation.

Visual Focus Method

Macintosh: First, invoke the preview scan. Next, click on the FOCUS button in the Scan dialog, as seen in Figure 14.1. If the Focus Level Meter appears, you are in the wrong focus mode for this method. Go back to the Tools dialog and make sure that the SCANNING FOCUS check box is checked.

The Visual Focus method enables you to position a magnifying cursor over a region of interest within the preview window. Position the cursor to indicate the desired area for focusing, then click to set the current position. This will cause a maximum zoom setting to be sent to the scanner and a region of the film surrounding the position of the magnifying cursor will be repetitively scanned. This region will then fill the preview window. During the focus operation, the FOCUS button changes to a STOP button. Clicking on the STOP button ends the Visual Focus operation.

The Scan dialog box is shown in Figure 14.4a, during a Visual Focus operation.



Figure 14.4a The Scan dialog in Visual Focus mode – Macintosh. The user clicks on the FOCUS button, then positions the magnifying cursor over the region of interest and clicks. The film is repetitively scanned with a highly magnified scan and displayed in the preview window, allowing the user to fine focus.

Windows: First, invoke the preview scan. Next, while holding down the Control key, click on the FOCUS button in the Scan dialog, as seen in Figure 14.1. During the focus operation, the FOCUS button changes to a STOP button.

The Visual Focus method enables you to position a magnifying cursor over a region of interest within the preview window. Position the cursor to indicate the desired area for focusing, then click to set the current position. This will cause a maximum zoom setting to be sent to the scanner and a region of the film surrounding the position of the magnifying cursor will be repetitively scanned. This region will then

fill the preview window. Next, position the focus wheel to achieve the best sharpness. You must click the CANCEL button to stop the Visual Focus scanning. Clicking on the STOP button ends the Visual Focus operation.

The Scan dialog box is shown in Figure 14.4b, during a Visual Focus operation.

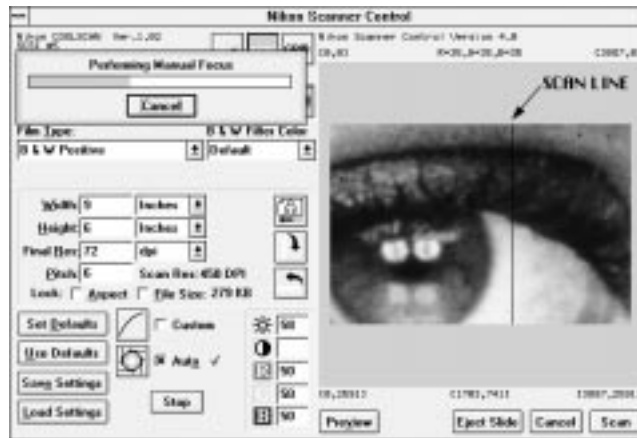


Figure 14.4b The Scan dialog in Visual Focus mode – Windows. While holding down the Control key, the user clicks on the FOCUS button, then positions the magnifying cursor over the region of interest and clicks. The film is repetitively scanned with a highly magnified scan and displayed in the preview window, allowing the user to fine focus.



A blurry or ‘soft’ original image cannot be made sharper using the focus control. In fact, out of focus images are much harder to focus on. Use the Visual Focus method to focus on the film grain.

Gamma Curve Controls

Gamma Curve Controls

Gamma is the measure of contrast in photographic images. For the most accurate control of the red, green, and blue exposures associated with the scanner, the Nikon Scanner plug-in features adjustable *gamma curves*. Editing the gamma curves is accomplished in the Gamma Curve Editor dialog, which is described in Chapter Sixteen.

Gamma Curve Editor Button

The Gamma Curve Editor dialog is accessed by clicking the Gamma Curve Editor button in the Scan dialog, shown in Figure 15.1. Once in the Gamma Curve Editor dialog you can modify the gamma curves. When you exit from the Gamma Curve Editor dialog, you return to the Scan dialog.



Figure 15.1 The Gamma Curve Editor button.

Custom Check Box

For the modified gamma curves to be used, they must first be downloaded to the scanner. The gamma curves will be sent to the scanner before the next scan occurs if the `CUSTOM` check box in the Scan dialog is checked. When checked, clicking on this box will disable this function and remove the check mark.



Figure 15.2 The `CUSTOM` check box in active state – Macintosh and Windows.

Scanner Gamma Curves

General: The scanner uses a set of gamma curves to adjust the color data acquired from the film, before sending the data to the computer. The scanner is initialized with a set of default gamma curves. These gamma curves can be changed by sending new gamma curves to the scanner. These new gamma curves are called *Custom* curves.

Just one set of gamma curves can reside in the scanner at a time. If either a color

positive or negative film type is selected, there are four gamma curves, represented by the *Red*, *Green*, *Blue* and *Master* curves. If either a black and white positive or negative film type is selected, there is only one gamma curve, represented by the *Monochrome* curve.

If the gamma curves are modified in the Gamma Curve Editor dialog, and if the Gamma Curve Editor dialog is quit using the **DONE** button (as opposed to the **CANCEL** button), the Nikon Scanner plug-in anticipates that you wish to download these new curves to the scanner before the next scan. The plug-in will indicate to you that it will send these curves to the scanner before the next scan by placing a check in the **CUSTOM** check box.

Macintosh: The plug-in remembers the state of custom gamma curves. When you exit the plug-in, these curves will be saved in the preferences file. The next time the plug-in is run, these custom curves will be loaded.

Note that you can return to the factory default gamma settings at any time by deleting the plug-in preferences file, which is located in the preferences folder.

Windows: Note that you can return to the factory default gamma settings at any time by deleting the plug-in's **NKNCTRL.INI** file, which is located in the "Nikon" directory.

Changing Your Mind

If you decide that you don't want to send new gamma curves to the scanner, you can abort the operation by clicking in the **CUSTOM** check box, removing the check mark.

Similarly, if the plug-in has custom gamma curves available, you can reselect these after deselecting them. This is accomplished by clicking in the **CUSTOM** check box after the check was removed. For example, suppose that you have changed the gamma curves and quit the Gamma Curve Editor dialog by clicking on **DONE**. This will cause the **CUSTOM** check box to be checked. You can un-check this box again by clicking on it. This check box can be toggled as many times as is necessary. The custom curves will not be altered, just switched on or off.

The Gamma Curve Editor Dialog

The Gamma Curve Editor dialogs, seen in Figures 16.1a, 16.1b, 16.2a and 16.2b, provide precise controls for manipulating the gamma curves associated with the scanner.



Figure 16.1a The large Gamma Curve Editor dialog – Macintosh.



Figure 16.1b The large Gamma Curve Editor dialog – Windows.

The Gamma Curve Editor dialog consists of the preview window, curve window, a set of general control buttons, curve manipulation buttons, and color buttons.



Figure 16.2a The small Gamma Curve Editor dialog – Macintosh.

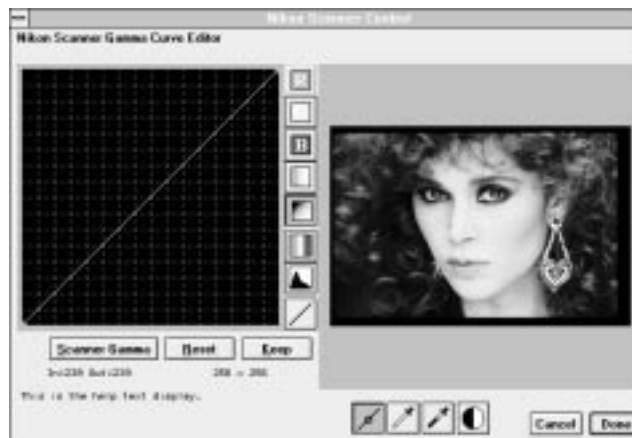


Figure 16.2b The small Gamma Curve Editor dialog – Windows.

The Interactive Help Button (Macintosh only)

If at any time you require help in the Gamma Curve Editor dialog, you can click on the INTERACTIVE HELP button, seen in the top portion of Figure 16.3, to view short help messages relevant to each control. The messages will appear in a help message box in the space normally occupied by the INTERACTIVE HELP button. For example, if the

arrow cursor is placed over the DISK SPACE status message in the Scan dialog, the message box would appear as seen in the bottom portion of Figure 16.3.

If enabled, the help messages can be disabled by clicking in the help message box.

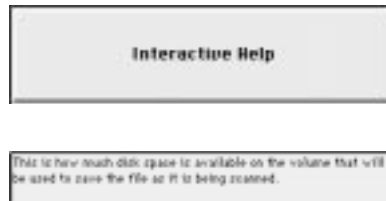


Figure 16.3 The INTERACTIVE HELP button, also the help message box.

Gamma Curves

Selecting the proper gamma curve(s) is essential to high-quality scanning. In many cases, the factory default gamma curves will yield excellent results. These default gamma curves are well suited to the widest variety of film possible. However, under certain circumstances, you may want to use other gamma curves.

Gamma curves can be generated inside the Nikon Scanner plug-in or in several other graphics imaging applications. The plug-in can read any Adobe Photoshop gamma curves, saved from the Curves dialog in Photoshop.

Gamma curves in the scanner include the individual color gamma curves, the Monochrome gamma curve, and the Master gamma curve. When a color film type is selected, the Red, Green and Blue (RGB) gamma curves are used in conjunction with the Master gamma curve. When a black and white film type is selected, the Monochrome curve is used in conjunction with the Master gamma curve.

Gamma curves are loaded by the scanner and applied to the scan data before the final data is sent to the computer.

Custom and Default Gamma Curves

Macintosh: There are four different sets of gamma curves available to you in the Nikon Scanner plug-in. These are the *factory default gamma curves*, the *default custom gamma curves*, the default custom gamma curves embedded in the plug-in's default settings files, and the custom gamma curve files found in the Gamma Curve Editor dialog. The factory default gamma curves *cannot* be modified, while the latter three types can.

Windows: There are two different sets of gamma curves available to you in the Nikon Scanner plug-in. These are the *factory default gamma curves* and the *custom*

gamma curves, found in the Gamma Curve Editor dialog. The factory default gamma curves *cannot* be modified, while the custom curves can.

Where Gamma Curves Reside (Macintosh only)

The gamma curves reside in several locations. These include the factory default gamma curves embedded in the plug-in's preferences file, the default custom gamma curves embedded in the plug-in's preferences file, the custom gamma curves embedded in the plug-in's settings files, and the custom gamma curves stored on disk as gamma files.

A data flow diagram is presented in Figure 16.4. The goal is to use the best gamma curves available to the scanner for a particular image. As you can see, there are several ways to load gamma curves into the scanner via the Nikon Scanner plug-in.

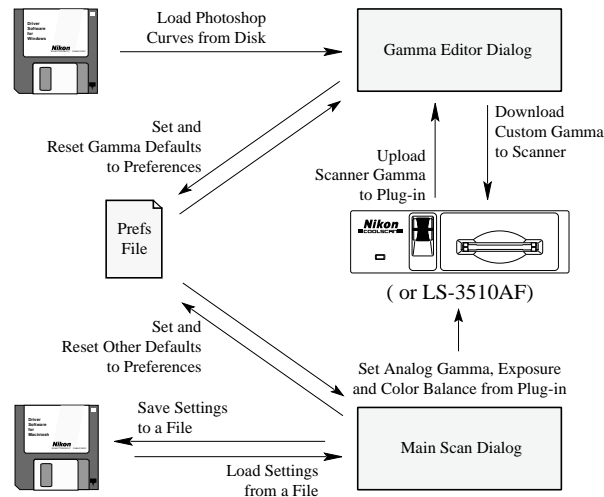


Figure 16.4 The gamma curve data flow diagram – Macintosh.

Sending Gamma Tables to the Scanner

The factory default gamma curves reside in the scanner, so it is not necessary to send them to the scanner. Conversely, default custom gamma curves or gamma 'tables' must be sent to the scanner if they are to be utilized.

The important point to understand is that the gamma curves sent to the scanner are the ones currently active in the Scan dialog. These might be the factory default curves which are loaded into the Nikon Scanner plug-in at start-up, the default custom

curves, the custom curves embedded in the plug-in's settings files, or curves created in the Gamma Curve Editor dialog.

Custom Check Box

The CUSTOM check box in the Scan dialog can be clicked on or off at any time. If the CUSTOM box is checked, the default custom gamma curves are sent to the scanner before a scan is initiated. The custom curves will only be sent to the scanner if the CUSTOM check box is checked in the Scan dialog.

If you do not want to use the default custom gamma curves, the CUSTOM check box should be un-checked. No custom curves are sent to the scanner if the CUSTOM check box is un-checked. Instead, the scanner will use its factory default gamma curve settings.

Factory Default Gamma Curves

Nikon has included predetermined default gamma curves, which are resident in the Nikon scanner's ROM. Note that the factory default gamma curves are permanent, and there is no way to change their value.

Default Settings (Macintosh only)

The *default settings* are loaded by the plug-in whenever it is launched, or any time the RESET button in the Scan dialog is selected. The default settings, however, should not be confused with the *factory default settings*. The default settings reside in the Nikon Scanner plug-in's preferences file.

If the plug-in does not find a preferences file upon start-up, which contains the default settings, it creates a preferences file and loads it with the factory default settings. So, in this scenario, the default settings would be identical to the factory default settings.

At any time, you can save the custom gamma curves currently in the Scan dialog as the default custom gamma curves in the default settings file. This is accomplished by first clicking the SET DEFAULTS button in the Scan dialog. The custom gamma curves in the Scan dialog will be written into the preferences file, overwriting the current default gamma curves in the default settings file. Note, however, that saving these custom curves to the default settings file will also save the settings of the other parameters in the Scan dialog, such as film type.

Using the default settings can often save time, as they can be applied repeatedly in order to attain consistent results across many different images. To load the default settings, click the RESET button in the Scan dialog. This should not be confused with the RESET button found in the Gamma Curve Editor dialog.

To restore the original factory default settings to the preferences file, delete the preferences file and restart the plug-in.

Load Settings and Save Settings

As you learned in the previous section, the default settings file contains a complete set of default custom gamma curves. The default settings file also contains information on the film type, crop rectangle, and other parameters.

The Nikon Scanner plug-in also features the ability to save and recall additional sets of default settings at any time through the **SAVE SETTINGS** and **LOAD SETTINGS** buttons in the Scan dialog. In both cases, a standard file dialog will appear requesting the name and location pertaining to the file. These dialogs are shown in Figures 16.5a, 16.5b, 16.6a and 16.6b for Macintosh and Windows.

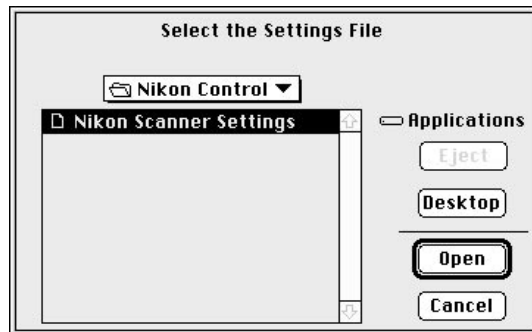


Figure 16.5a The LOAD SETTINGS dialog – Macintosh.



Figure 16.5b The LOAD SETTINGS dialog – Windows.

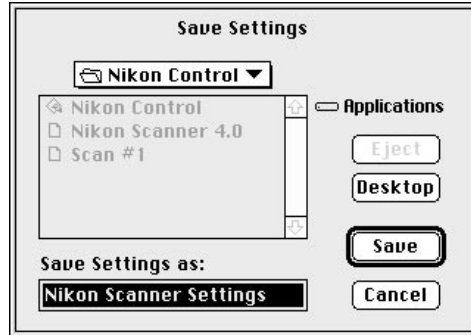


Figure 16.6a The SAVE SETTINGS dialog – Macintosh.

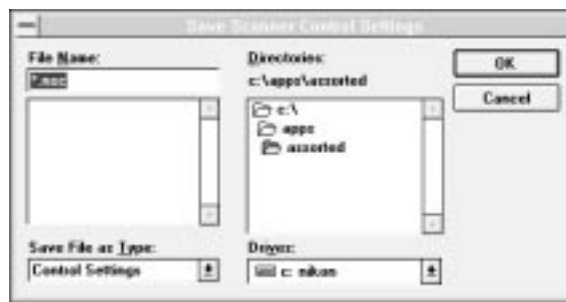


Figure 16.6b The SAVE SETTINGS dialog – Windows.

Again, the gamma curves embedded in any of these settings files become the new *default custom gamma curves*, until you select another settings file or the factory default settings. Note, however, that clicking the LOAD SETTINGS button does *not* check the CUSTOM check box in the Scan dialog. Therefore, even though a set of default custom gamma curves are read into the plug-in, these will *not* be sent to the scanner unless the CUSTOM check box is checked.

Loading Curves from Gamma Files

Like settings files, gamma curves can be created and saved as gamma curve files in your imaging application, e.g. Photoshop, and loaded back into the Nikon Scanner plug-in through the Gamma Curve Editor dialog.

Entering the Gamma Editor

Clicking the GAMMA EDITOR button in the Scan dialog opens the Gamma Curve Editor dialog.

Loading the Factory Default Gamma Curves

If you have sent custom gamma curves to the scanner during a scanning session, the active gamma curves were overwritten. To reload the default gamma curves back into the Gamma Curve Editor dialog, simply click the SCANNER GAMMA button.

If the Option key (*Macintosh*) or Control key (*Windows*) is held down while the SCANNER GAMMA button is clicked, as shown in Figure 16.7a for Macintosh and Figure 16.7b for Windows, all three (R,G,B) curves will be read from the scanner. Similarly, if the Master curve is active when the SCANNER GAMMA button is clicked, all of the curves will be read from the scanner.



Figure 16.7a Reading gamma curves from the scanner, key command – Macintosh.



Figure 16.7b Reading gamma curves from the scanner, key command – Windows.

Loading Custom Gamma Curves (Macintosh only)

Custom gamma curves created in your imaging application can be loaded by clicking on the LOAD button in the Gamma Curve Editor dialog. Once clicked, a file dialog will be presented prompting you for the location and name of the desired gamma file, as shown in Figure 16.8.

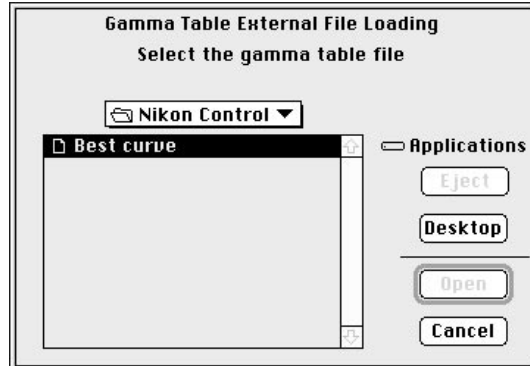


Figure 16.8 The Gamma Table loading dialog – Macintosh.



Custom gamma curves can be created in Photoshop only by saving them from the “Curves” dialog, *not* from “Levels” or other dialogs. Only curves stored as coefficients for a B-spline curve generator can be loaded by the plug-in. Photoshop stores curves from the Curves dialog using this method. Other methods, such as bitmap, are not compatible.

If the Option key is held down while the LOAD button is clicked, as shown in Figure 16.9, only the Master curve will be loaded.



Figure 16.9 The LOAD gamma curve(s) button/keystroke – Macintosh.

Custom gamma curves can also be loaded from a settings file by clicking on the LOAD SETTINGS button in the Scan dialog.

Resetting the Gamma Curves

When working in the Gamma Curve Editor dialog, it is possible to reset the gamma curves to their original values by clicking on the RESET button, shown in Figure 16.10. The original values are those in effect at the time that the Gamma Curve Editor dialog is invoked. This should not be confused with the RESET button found in the Scan dialog.

If the Option key (*Macintosh*) or Control key (*Windows*) is held down while the RESET button is clicked, all of the curves will be reset.



Figure 16.10 The RESET gamma curve(s) button – Macintosh and Windows.

Viewing the Gamma Curves

The gamma curves consist of *primary* and *master* curves. If a color film type is selected, the primary curves are Red, Green and Blue (RGB). If a black and white film type is selected, the primary curve is Monochrome. In either case, a Master curve is present. Gamma curves sent to the scanner always consist of primary and master curves.

Each of the Red, Green and Blue gamma curves is unique. The Master curve provides a simple means of adjusting all of the primary curves equally. Thus, you do not have to adjust each primary curve individually, as illustrated in Figure 16.11.

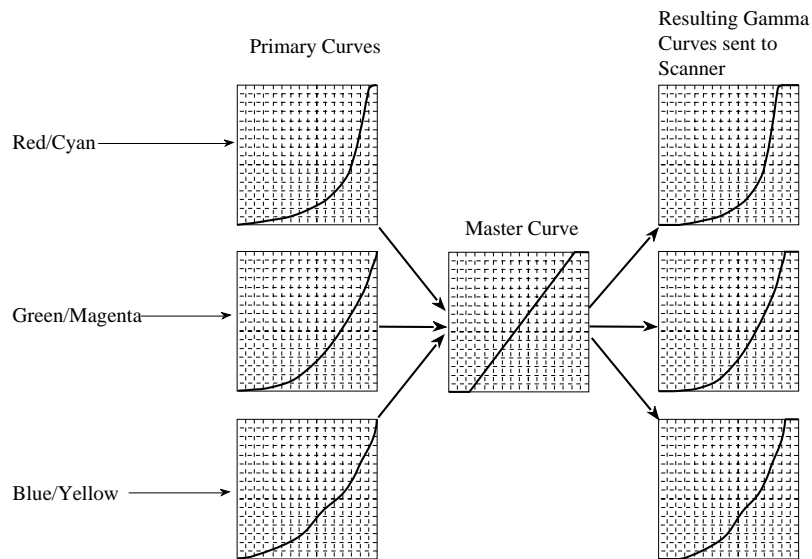


Figure 16.11 The resulting gamma curves sent to the scanner are a combination of the primary (red/cyan, green/magenta, blue/yellow) gamma curves and the Master curve.

Red/Cyan, Green/Magenta and Blue/Yellow (RGB) Gamma Curves

The Red/Cyan, Green/Magenta and Blue/Yellow gamma curves can be viewed individually by clicking on their respective buttons in the Gamma Curve Editor dialog. The appropriate gamma curve is then displayed in the curve window. It remains active until another gamma curve button is selected. A typical curve is shown in Figure 16.12, in this case the Red/Cyan gamma curve.

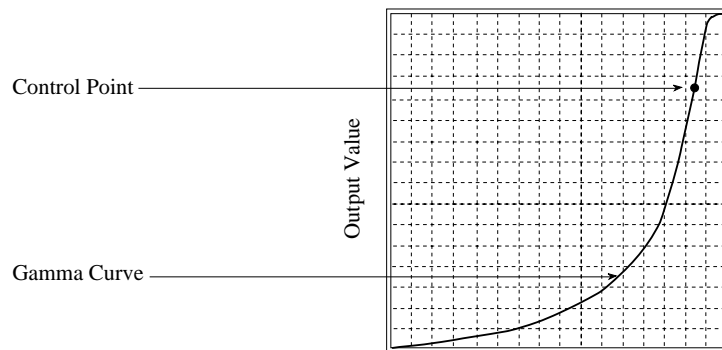


Figure 16.12 The Red/Cyan gamma curve shown graphically in the curve window.

This two-dimensional graph represents the *input/output transfer function*. The horizontal axis represents the input, or original gamma levels. The vertical axis represents the output, or new gamma levels. The bottom of the gamma curve represents the shadow values in an image. The middle area represents the midtone values, and the top of the curve represents the highlight values in an image.

The input and output values on 8-bit scanner models range from 0 to 255. The input values on 12-bit scanner models range from 0 to 4095, while the output values are still limited to the range of 0 to 255.

A diagonal line connecting the lower-left and upper-right corners would represent a linear transfer function. For example, an input value of 100 would produce an output value of 100. Similarly, a 200 input would produce a 200 output, and so on. A horizontal line running along the bottom border would map all inputs into a zero output, consequently creating a black image.

Monochrome Gamma Curve

The Monochrome gamma curve is viewed by clicking on the Monochrome button in the Gamma Curve Editor dialog, shown in Figure 16.13. The Monochrome curve is identical to the color curves, but is active only when a Monochrome film type is selected. The resultant Monochrome gamma curve sent to the scanner is the combina-

tion of the Monochrome primary gamma curve and the Master curve.



Figure 16.13 The Monochrome gamma curve button.

Master Gamma Curve

The Master gamma curve is viewed by clicking on the Master curve button in the Gamma Curve Editor dialog, shown in Figure 16.14. This control is only active when a color film type is selected in the Scan dialog. Adjustments to the Master curve are applied to all of the primary curves before they are sent to the scanner, as shown in Figure 16.11. For example, raising the brightness of the Master gamma curve would raise the brightness of the red, green and blue content in the image. The Master curve is initialized as a diagonal linear function representing a 1:1 input/output relationship.



Figure 16.14 The Master gamma curve button.

Red, Green, and Blue (RGB) Gamma Curves

At times it is desirable to view all of the gamma curves simultaneously. These include the Master curve, and the R, G, and B primary gamma curves. This is accomplished by clicking and holding the RGB button in the Gamma Curve Editor dialog, shown in Figure 16.15. As long as the button is held down, all of the curves will be displayed. A typical set of curves is shown in Figure 16.16.

This control is only active when a color film type is selected in the Scan dialog.



Figure 16.15 The RGB gamma curve button.

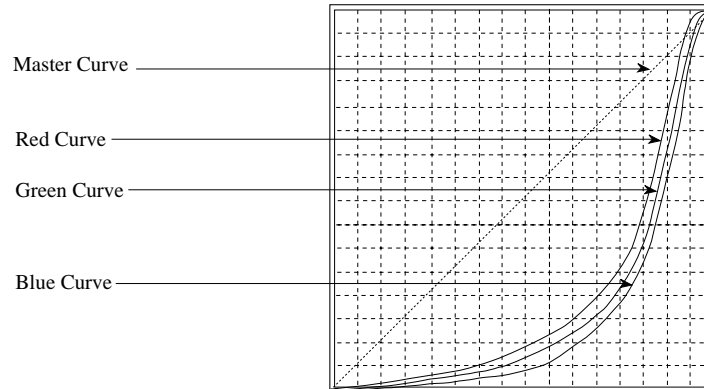


Figure 16.16 Display of the R,G,B and Master gamma curves.

Viewing the Histogram

At times it may be useful to view the *histogram* of the preview image. A histogram is the statistical representation of the densities in an image. This is accomplished by clicking and holding the Histogram button in the Gamma Curve Editor dialog, shown in Figure 16.17. As long as the button is held down, the histogram will be displayed. A typical histogram is displayed in Figure 16.18.

This control is active when either a monochrome or color film type is selected in the Scan dialog. The histogram is viewable only while the mouse button is held down.



Figure 16.17 The Histogram button.

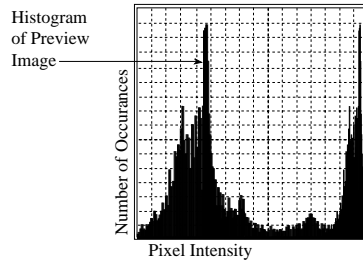


Figure 16.18 The histogram of a preview image.

The histogram's horizontal axis represents the pixel intensity, the high density (darker) values appearing on the left and the low density (lighter) values on the right. The vertical axis represents a scaled version of the number of occurrences of each pixel value. The histogram therefore represents a graphical view of the brightness of an image.

Adjusting the Preview Image

In order to modify the gamma curves accurately and effectively, it is necessary to understand the nature of the film being scanned. It is possible with the Nikon Scanner plug-in to perform gradation correction of the image data in the preview window. This involves setting *control points* on the gamma curves, selecting the *white point* and *black point*, and performing *automatic contrast adjustment*.

Setting Control Points on the Gamma Curves

In Figure 16.20, a control point is seen superimposed on the Master gamma curve. This control point provides a means to relate densities in the preview window to a point on the Master gamma curve. All pixels in the preview window have colors that correspond to points on the Master gamma curve. By clicking the Marker button in the Gamma Curve Editor dialog, shown in Figure 16.19, then placing the mouse over the preview image, an arrow cursor will appear.



Figure 16.19 The gamma curve Marker button – Macintosh and Windows.

As you move the cursor across the preview image, a temporary marker is displayed on the active gamma curve and the R,G,B component values of the pixels are displayed

in a text message beneath the gamma curve window. If the mouse is clicked, a control point is placed on the gamma curve for reference. This is illustrated in Figure 16.20.

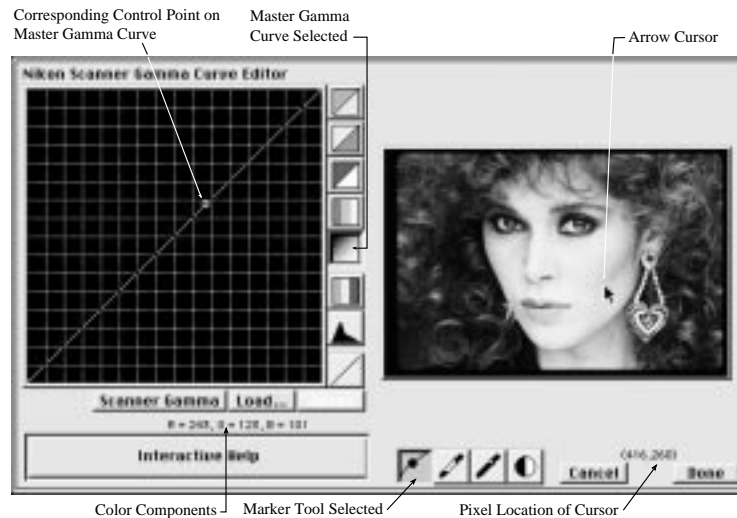


Figure 16.20 Setting Markers on the Master gamma curve.

This process can be repeated to place additional control points on the Master gamma curve for reference. For example, you could select a point in the shadows, in the midtones, and in the highlights, thus leaving three reference markers on the gamma curve.

Setting the Black Point

The Black Point represents the darkest point in the image.

The Black Point is typically selected such that all values in the image that are darker than this point can be 'mapped,' or converted to black without disrupting the quality of the image. For example, suppose that a black area in the image is represented by a 10 in the scanned data. Values 0–9 would be wasted since no pixel in the image would have any value lower than 10, unless there are no blacks in the original image. By setting the Black Point to 10, a re-mapping of the data would occur such that a value of 10 from the scanner would consequently produce a 0.

When the Black Point is selected, the active gamma curve is automatically adjusted to reflect this selection. For example, suppose that the original Master curve was a diagonal linear 1:1 mapping and the Black Point selected corresponded to the Black Point in the top graph in Figure 16.21. The resulting Master curve would be changed as seen in the bottom graph in Figure 16.21.

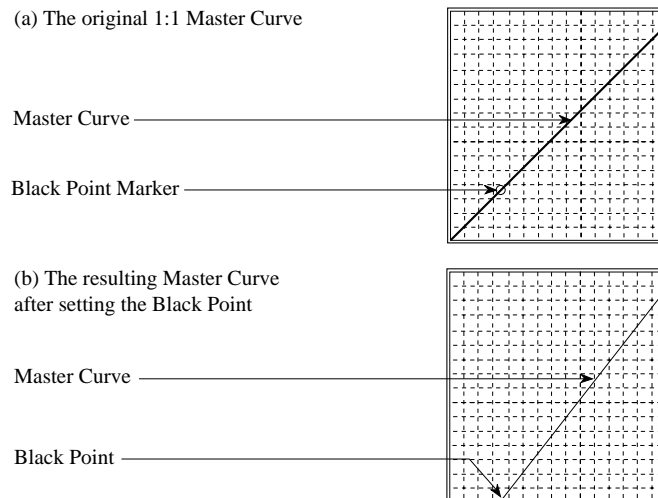


Figure 16.21 Setting the Black Point.

This tool can be used with any gamma curve, although it is most effective when used with the Master gamma curve.

After the Black Point button is clicked, shown in Figure 16.22, position the mouse cursor over the image in the preview window and select a pixel value to be used as the darkest point in the image. This will be the Black Point, or reference point for darkness. In addition, the pixel's location and RGB component values will be displayed, as described in the "Marker Button" section of this manual.



Figure 16.22 The Black Point button – Macintosh and Windows.

When you decide on the pixel you want to use as the image's Black Point, clicking the mouse forces the gamma curves to use this value as the minimum value in the preview window. Any pixels darker than the black point will be set to the minimum value. The result of this new curve is approximated in the preview window.

Setting the White Point

The White Point represents the lightest point in the image, thus serving the reverse function of the Black Point. Like the Black Point, selection of a White Point

reduces the tonal range of the image data so as not to waste any of its tonal range on light areas that are not actually present in the film.

The White Point is typically selected such that all values in the image that are lighter than this point can be 'mapped,' or converted to white without disrupting the quality of the image.

Selection of the White Point and Black Point is illustrated in the Master curve of Figure 16.23. Note that all pixels in the image darker than the Black Point will be mapped to Black, while all points lighter than the White Point will be mapped to white.

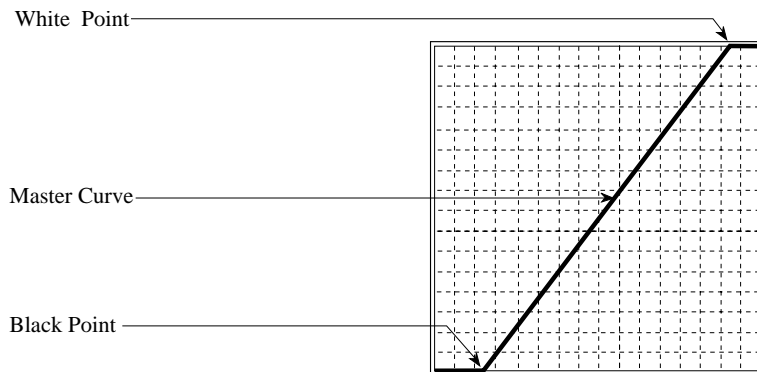


Figure 16.23 The White and Black Point set in the Master curve.

When the White Point is selected, the active gamma curve is automatically adjusted to reflect the Black Point.

After the White Point button is clicked, shown in Figure 16.24, position the mouse cursor over the image in the preview window and select a pixel value to be used as the lightest point in the image. This will be the White Point, or reference point for darkness. In addition, the pixel's location and RGB component values will be displayed as described in the Marker button section.



Figure 16.24 The White Point button – Macintosh and Windows.

When you decide on the pixel value you want to use as the image's White Point, clicking the mouse forces the gamma curves to use this value as the minimum value in the preview window. Any pixels lighter than the White Point will be set to the minimum value. The result of this new curve is approximated in the preview window.

This tool can be used with any gamma curve, although it is most effective when used with the Master gamma curve.

Automatic Contrast Adjustment (Automatic Black Point and White Point Selection)

If you prefer, the Nikon Scanner plug-in is capable of selecting optimal Monochrome Points for you. The *automatic contrast adjustment* control in the plug-in will usually produce excellent results. Simply click the Contrast Adjust button, shown in Figure 16.25, in the Gamma Curve Editor dialog. The image data within the crop rectangle is analyzed to produce the Black Point and White Point. The active gamma curves will automatically be modified.



Figure 16.25 The Contrast Adjust button.

Modifying the Gamma Curves

Modifying the gamma curves is relatively easy, but modifying them *correctly* is not. While the effects of altering the Master curve are relatively straightforward, the relationships between the Red/Cyan, Green/Magenta and Blue/Yellow gamma curves are far more complex, and the result more difficult to predict.

The gamma curves can be modified manually or automatically. The manual mode involves selecting and moving points on the gamma curves with the mouse, thereby graphically reshaping the curve.

A semi-automated technique involves the White Point and Black Point selection, which was discussed in a previous section. This will simplify the process somewhat. It is also possible to use control points to assist in correctly adjusting the gamma curves. As you learned in the preceding section, the automatic contrast adjustment control is a fully automated technique for selecting the image's Black Point and White Point.

Graphically Altering a Gamma Curve

The individual gamma curves in the gamma curve window can be manually altered by clicking the mouse at points on the gamma curve and dragging, thus reshaping the curve. The primary gamma curves are accessed by clicking on the appropriate button in the Gamma Curve Editor dialog:

Macintosh:

Red/Cyan gamma curve button: the top-most button in the center of the Gamma Curve Editor dialog, allows adjustment of the red-to-cyan gamma curve.

The Green/Magenta gamma curve button: immediately below the Red/Cyan button, allows adjustment of the green-to-magenta gamma curve.

The Blue/Yellow gamma curve button: immediately below the Green/Magenta button, allows adjustment of the blue-to-yellow gamma curve.

Windows:

Red gamma curve button: the R button in the Gamma Curve Editor dialog, allows adjustment of the red gamma curve.

Green gamma curve button: the G button in the Gamma Curve Editor dialog, allows adjustment of the green gamma curve.

Blue gamma curve button: the B button in the Gamma Curve Editor dialog, allows adjustment of the blue gamma curve.

These controls are only active when a color film type is selected in the Scan dialog.

You will notice that changes to the shape of the gamma curves will cause corresponding changes to the tonal quality of the image, as seen in the adjacent image preview window. As the curve is altered, a curve-fitting software algorithm redraws the new curve.

As mentioned earlier, the bottom portion of the gamma curve corresponds to the image's shadow areas. The middle portion corresponds to the image's midtones, and the top portion to the highlights. An example is shown in Figure 16.26, in which the original gamma curve is shown as the lighter line. Two marker points were placed on this gamma curve, one in the shadows region of the curve and one in the highlights region of the curve. By moving the highlight marker to the right and the shadow marker up and to the left, the gamma curve is redrawn and shown as the darker curve.

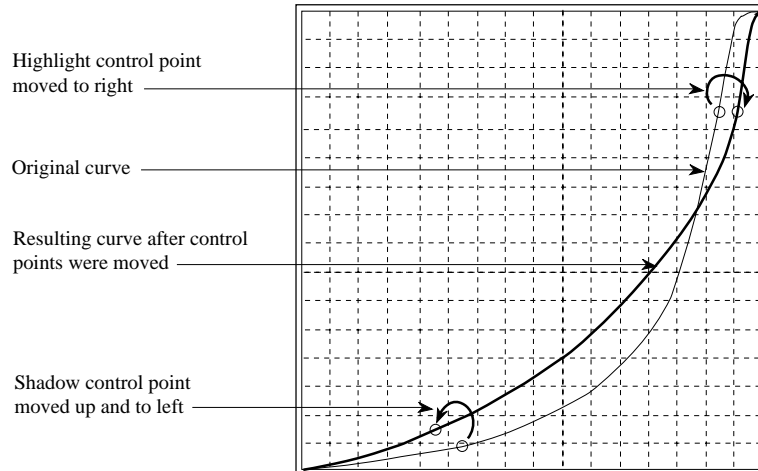


Figure 16.26 Graphically altering a gamma curve.

This technique, while providing the finest control over the image, will require a good deal of trial and error to achieve the best results. Depending on how critical your results are and how much time you have to achieve them, you may want to rely on the scanner's automated gamma controls instead.

Forcing a Gamma Curve to Linear

In some cases, a linear gamma curve offers a better starting point for adjustments than the default gamma curve. Clicking the Force Linear button in the Gamma Curve Editor dialog, shown in Figure 16.27, 'forces' whichever gamma curve is active to a linear, or 1:1 state.



Figure 16.27 The Force Linear button.

Exiting the Gamma Curve Editor Dialog

There are two ways to exit the Gamma Curve Editor dialog, thereby returning control to the Scan dialog. These are CANCEL and DONE. In short, the difference between the two is that CANCEL does not save the results from the current gamma curve editing session, while DONE does. In addition, DONE assumes that you want the new gamma curves to be sent to the scanner as custom gamma curves.

Exiting Without Saving Results of the Editing Session

Often the results of a gamma curve editing session are instructional, yet undesirable. When this is the case, you will want to discard these resulting curves, as opposed to saving them. This is easily accomplished by clicking on the CANCEL button in the Gamma Curve Editor dialog, seen in Figure 16.28. No changes will then be recorded. The next time that the Gamma Curve Editor dialog is invoked, the gamma curves will be identical to the curves opened before the last session.



Figure 16.28 The CANCEL button, for saving current gamma curves – Macintosh and Windows.

Exiting and Saving Results of the Editing Session

You can exit the Gamma Curve Editor dialog while also sending the various gamma curves to the scanner before the next scan. This is accomplished by clicking on the DONE button, shown in Figure 16.29. No data is sent to the scanner from the Gamma Curve Editor dialog *after* DONE is clicked. Instead, the CUSTOM check box found in the Scan dialog box is checked (see Chapter Fifteen). If the CUSTOM box remains checked, the curves generated within the Gamma Curve Editor will be sent to the scanner. If the check box is clicked, the check mark will disappear and the curves generated within the Gamma Curve Editor will *not* be sent to the scanner.



Figure 16.29 The DONE button in the Gamma Curve Editor dialog – Macintosh and Windows.

Nikon Control Application Software – Macintosh

Nikon Control is a simple to use, yet effective scanning application providing complete control of Nikon scanners. While it is a stand-alone program, it utilizes the Nikon Scanner plug-in, just like other imaging applications, such as Photoshop.

The Nikon Control application is menu driven, and utilizes standard file dialogs. Among its features, Nikon Control allows you to scan and save images, and zoom-in on and zoom-out of areas of interest within scanned images. Complete scanning control is provided via the Nikon Scanner plug-in, described in detail in this manual.

Launching Nikon Control

The Nikon Control application is launched by double clicking on its icon, shown in Figure 17.1.



Figure 17.1 Launching Nikon Control.

Scan Windows

Nikon Control is based on three elements: a simple menu system, the Nikon Scanner plug-in, and *scan windows*. The scan windows are standard resizable, scrollable document windows. A scan window will contain a full-crop image upon performing a scan. A typical scan window is shown in Figure 17.2.



Figure 17.2 A typical scan window.

Status Bar

The Status bar shows you information about the image currently displayed. The information is the Height and Width (always in pixels) and the resolution and size of the file.

The Main Menu

The Nikon Control Main menu, shown in Figure 17.3, consists of the Apple menu, the FILE menu and the EDIT menu.



Figure 17.3 The Nikon Control Main menu.

The Apple Menu

The Apple menu contains the ABOUT NIKON CONTROL menu item, and items in your Apple Menu Items folder (RAM) or Desk Accessories (System 6), as seen in Figure 17.4.



Figure 17.4 The Apple menu.

When selected, the ABOUT NIKON CONTROL dialog provides pertinent information regarding the Nikon Control application and the Nikon Scanner plug-in, as shown in Figure 17.5.



Figure 17.5 The ABOUT NIKON CONTROL dialog.

The File Menu

The FILE menu, seen in Figure 17.6, contains commands to perform scans, close scan windows, save new scans to a disk file, eject the film from the scanner, and quit the application.



Figure 17.6 The FILE menu.

New Scan

The Nikon Scanner plug-in's Scan dialog will appear when Nikon Control is first launched. The Command “⌘” – “N” keyboard shortcut will invoke the NEW SCAN command. The plug-in's Scan dialog is shown in Figure 17.7.

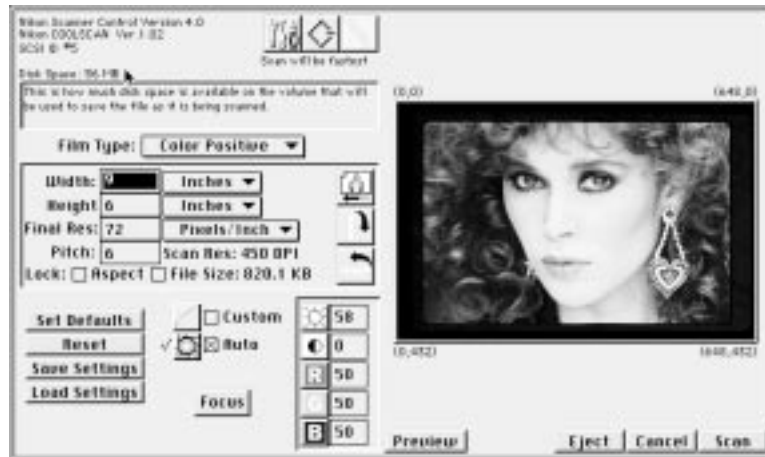


Figure 17.7 The Nikon Scanner plug-in's Scan dialog.

Close

A scan window can be closed by selecting the FILE menu's CLOSE command, or by clicking the standard close box in the upper-left corner of the window. If the image in the window resulted from a new scan and has not been saved to disk, a query dialog,

shown in Figure 17.8, will appear. The Command “⌘” – “W” keyboard shortcut will also invoke the CLOSE command.

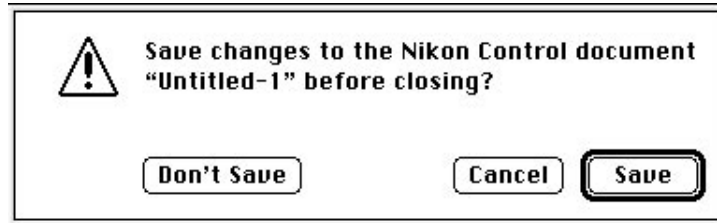


Figure 17.8 Closing or saving a scanned image dialog.

Save As...

The SAVE AS... command causes the image in the active scan window to be saved as a file. The Save As... dialog appears, prompting you to enter a file name and select a file format. PICT and TIFF 5.0 formats are supported, which will allow you to import images created with your scanner to a wide variety of imaging and page layout software packages. The Save As... dialog is shown in Figure 17.9.

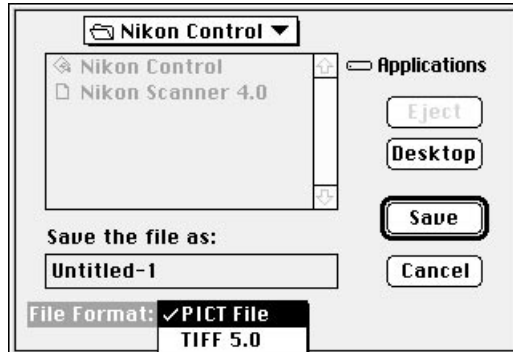


Figure 17.9 The Save As... dialog.

Eject

You can eject the film from the scanner’s film slot at any time that scanning is not in progress by selecting the EJECT command from the FILE menu. The Command “⌘” – “E” keyboard shortcut will also invoke an eject.

Quit

You can quit the Nikon Control application at any time that scanning is not in progress by selecting the QUIT command from the FILE menu. You will be prompted to save the images in any scan windows that are opened, but not yet saved. The Command “⌘” – “Q” keyboard shortcut will also invoke the QUIT command.

The Edit Menu

The Nikon Control EDIT menu, shown in Figure 17.10, consists of UNDO (last command), ZOOM IN, ZOOM OUT, DOUBLE ZOOM, HALVE ZOOM, SET ZOOM 1:1 and ORIGINAL SCAN ZOOM.

Edit	
Undo Zoom In	⌘Z
Zoom In	⌘+
Zoom Out	⌘-
Double Zoom	⌘2
Halve Zoom	⌘/
Set Zoom to 1:1	⌘1
Original Scan Zoom	⌘0

Figure 17.10 The EDIT menu.

Undo/Redo (Last Command Used)

The UNDO/REDO (LAST COMMAND USED) command enables you to revert to the last window state, regardless of which menu selection was made in the edit menu. All Edit menu items are supported. Command “⌘” – “Z” will invoke this function.

Zoom In

The ZOOM IN command enables you to magnify the view of the image in the active scan window.

The ZOOM IN command can be invoked in two ways:

1. Select the ZOOM IN command from the EDIT menu.
2. Simultaneously strike Command “⌘” – “+” on the keyboard.

Zoom Out

The ZOOM OUT command enables you to reduce the magnification of the view of the image in the active scan window.

The ZOOM OUT command can be invoked in two ways:

1. Select the ZOOM OUT command from the EDIT menu.
2. Simultaneously strike Command “⌘” – “-” (the minus sign) on the keyboard.

Double Zoom

The DOUBLE ZOOM command enables you to increase the magnification of the view of the image in the active scan window by 200%.

The DOUBLE ZOOM command can be invoked in two ways:

1. Select the DOUBLE ZOOM command from the EDIT menu.
2. Simultaneously strike Command “⌘” – “2” on the keyboard.

Halve Zoom

The HALVE ZOOM command enables you to decrease the magnification of the view of the image in the active scan window by 50%.

The HALVE ZOOM command can be invoked in two ways:

1. Select the HALVE ZOOM command from the EDIT menu.
2. Simultaneously strike Command “⌘” – “/” on the keyboard.

Set Zoom to 1:1

The SET ZOOM TO 1:1 command enables you to view the image in the active scan window at 72 dpi.

The SET ZOOM TO 1:1 command can be invoked in two ways:

1. Select the SET ZOOM TO 1:1 command from the EDIT menu.
2. Simultaneously strike Command “⌘” – “1” on the keyboard.

Original Scan Zoom

The ORIGINAL SCAN ZOOM command enables you to view the image in the active scan window at the original zoom factor. This will allow you to view the entire image.

The ORIGINAL SCAN ZOOM command can be invoked in two ways:

1. Select the ORIGINAL SCAN ZOOM command from the EDIT menu.
2. Simultaneously strike Command “⌘” – “0” (zero) on the keyboard.

Nikon Control Application Software – Windows

Nikon Control is a simple to use, yet effective scanning application providing complete control of Nikon scanners. While it is a stand-alone program, it utilizes the Nikon Scanner plug-in, just like other imaging applications, such as Photoshop.

The Nikon Control application is menu driven, and utilizes standard file dialogs. Among its features, Nikon Control allows you to scan and save images, and zoom-in on and zoom-out of areas of interest within scanned images. Complete scanning control is provided via the Nikon Scanner plug-in, described in detail in this manual.

Launching Nikon Control

The Nikon Control application is launched by double clicking on its icon, shown in Figure 18.1.



Figure 18.1 Launching Nikon Control.

Scan Windows

Nikon Control is based on three elements: a simple menu system; the Nikon Scanner plug-in; and *scan windows*. The scan windows are standard resizable, scrollable document windows. A scan window will contain a full-crop image upon opening a file, or performing a scan. A typical scan window is shown in Figure 18.2.



Figure 18.2 A typical scan window.

The Main Menu

The Nikon Control Main menu, shown in Figure 18.3, consists of the FILE menu, the EDIT menu and the WINDOW menu.



Figure 18.3 The Nikon Control Main menu.

The File Menu

The FILE menu, seen in Figure 18.4, contains commands to perform scans, open existing scanned image files into scan windows, close scan windows, save new scans to a disk file, and exit the application.

File	
N ew Scan... F2	
O pen	Ctrl+O
C lose	Ctrl+F4
S ave	Ctrl+S
Sa v e A s ...	
A bout	
E xit	Alt+F4

Figure 18.4 The FILE menu.

New Scan

The Nikon Scanner plug-in's Scan dialog is invoked when NEW SCAN is selected from the FILE menu. The F2 keyboard shortcut will also invoke the NEW SCAN command.

Open

Selecting this menu item will bring up the standard file open dialog. Only Targa and Windows Bitmap file formats are supported. Multiple files may be selected by using the Control and Shift keys. Holding down the Shift key will allow you to select a range of files. Holding down the Control key will allow you to toggle the selection of specific files. A typical Open dialog is shown in Figure 18.5.

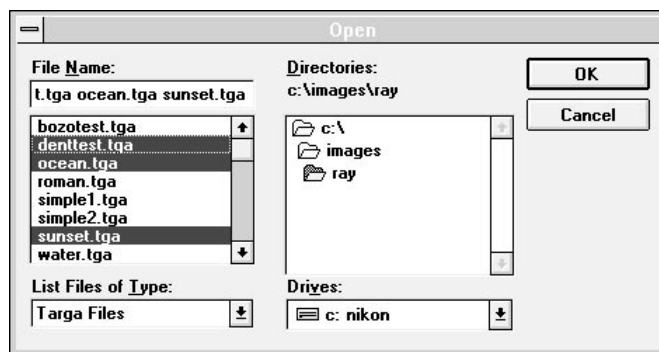


Figure 18.5 The OPEN FILE dialog.

Once a file is selected, a scan window is opened to accommodate the size of the image file. If the image size is larger than the available screen resolution, a maximum size scan window will be opened with scroll bars to allow you to view the entire image.

Close

A scan window can be closed by selecting the FILE menu's CLOSE command, or by clicking the standard close box in the upper-left corner of the window. If the image in the window resulted from a new scan and has not been saved to disk, a query dialog, shown in Figure 18.6, will appear. The Control – F4 keyboard shortcut will also invoke the CLOSE command.



Figure 18.6 Closing or saving a scanned image dialog.

Save

The SAVE command causes the image in the active scan window to be saved as a file. If the image has not been previously named and saved as a file, the SAVE AS... dialog will appear. The Control – S keyboard shortcut will also invoke the SAVE command.

Save As...

The SAVE AS... command causes the image in the active scan window to be saved as a file. The SAVE AS... command is typically used when you have modified a pre-existing file and want to save it as a new file, thus leaving the original file intact. Before performing the actual save, the SAVE AS... dialog appears prompting you to enter a file name and file format. The SAVE AS... dialog is shown in Figure 18.7.



Figure 18.7 The SAVE AS... dialog.

About

The ABOUT command will bring up a dialog showing the software version, copyright information and customer support information.

Exit

You can exit the Nikon Control application at any time that scanning is not in progress by selecting the EXIT command from the FILE menu. You will be prompted to save the images in any scan windows that are opened, but not yet saved. The Alt – F4 keyboard shortcut will also invoke the EXIT command.

The Edit Menu

The EDIT menu, seen in Figure 18.8, contains the COPY command, which is invoked by holding down the Control and “C” keys at the same time. Selecting this menu item will copy the image in the currently active window to the clipboard. If the entire image does not fit into memory, an error will be reported and the operation will fail. Most applications have a provision for importing .BMP or .TGA files. If the copy fails, the image should be saved and imported into the other application in this manner. If your system is running in 386 Enhanced Mode you can successfully copy the maximum size image to the clipboard by increasing the size of the swap file (using the 386 Enhanced Control Panel) to 40 megabytes. The COPY command is only available if an image is loaded in the window.



Figure 18.8 The EDIT menu.

The Window Menu

Cascade

The CASCADE menu item will arrange the windows that are not icons so that the title bar of each window is visible. This option is only available if an image is loaded.

Tile

The TILE menu item will arrange the windows that are not icons so that all of them are visible. This option is only available if an image is loaded.

Arrange Icons

The ARRANGE ICONS menu item will arrange the windows that are currently displayed in minimized form into rows across the bottom of the application window. This option is only available if an image is loaded.

Zoom In

The ZOOM IN command enables you to magnify the view of the image in the active scan window up to 8 times the original view.

The ZOOM IN command can be invoked in three different ways:

1. Select the ZOOM IN command from the WINDOW menu.
2. Simultaneously strike Control and "+" on the keyboard.

3. Place the cursor in the active scan window. The cursor will change shape to a magnifying glass with a "+" sign in the center. This is the Zoom In cursor, shown in Figure 18.9.



Figure 18.9 The Zoom In cursor.

Zoom Out

The ZOOM OUT command enables you to reduce the magnification of the view of the image in the active scan window up to 8 times the original view.

The ZOOM OUT command can be invoked in three different ways:

1. Select the ZOOM OUT command from the WINDOW menu.
2. Simultaneously strike Control and “-” (the minus sign) on the keyboard.
3. Place the cursor in the active scan window. The cursor will change shape to a magnifying glass with a “-” sign in the center. This is the Zoom Out cursor, shown in Figure 18.10.

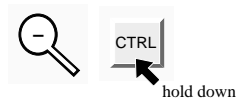


Figure 18.10 The Zoom Out cursor.

The “-” sign will disappear from the center of the Zoom Out cursor when it has reached maximum reduction.

Fit In Window

The FIT IN WINDOW command will zoom the currently active image anywhere from actual size out to 1:8 and resizes the window so that the entire image is visible. This option is only available if an image is loaded.

Autosize Window

The AUTOSIZE WINDOW command will attempt to resize the currently active window so that the entire image is visible. If the image is larger than the application window’s workspace, the window is sized to fill the workspace. This option is only available if an image is loaded.

Information

Selecting the INFORMATION menu item will show statistics about the currently active image. The display includes vital information about the image, as seen in Figure 18.11. The F3 key will invoke the Information command. This option is only available if an image is loaded.

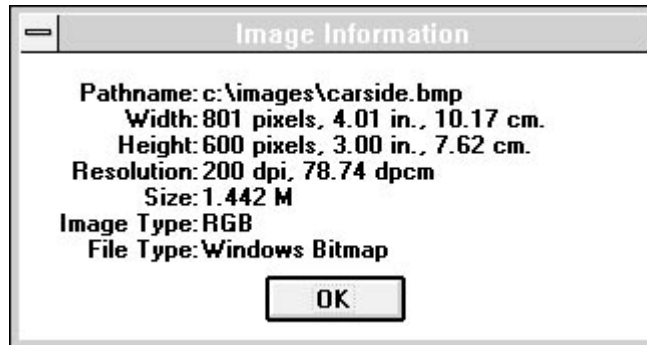


Figure 18.11 The Information Window.

Selecting the Active Scan Window

If you have multiple scan windows open at the same time, you will see each one listed if you pull down the **WINDOW** menu. You can select the window you want to be active by placing the menu scroll bar over it, then releasing the mouse button.

Troubleshooting – Macintosh

Following are some common problems you may encounter in the installation and operation of your scanner. Corrective action for each problem is listed by order of most likely cause. If a corrective action does not solve the problem, proceed to the next listed corrective action. If the problem persists after exhausting all of the suggested corrective actions, contact Nikon Technical Support at (516) 547-4311, or via FAX at (516) 547-0305 for assistance. Nikon Technical Support can also be contacted through the following electronic information services at the corresponding addresses:

AppleLink	Nikontech
PressLink	Nikon.Tech
America Online	Nikontech
Internet	Nikontech @ AOL.COM

• Problem: After installing the scanner, my Macintosh is displaying the flashing question mark when I start up.

Action: You most likely have a SCSI address conflict that is preventing your system from recognizing the disk used to start the system.

1. Shut the system off, remove the scanner, then restart.

If the system starts normally, check the SCSI ID number of all disk drives and other attached SCSI devices. Make sure that no device has the same SCSI ID number as the scanner. If so, power off all SCSI devices and reset their ID numbers accordingly. Reconnect the scanner, power-up, and proceed.

2. If the Macintosh still is displaying the flashing “?” you may have a termination problem. Make sure that you have a terminated device at the end of the SCSI chain. Macintosh IIfx systems require a special *black* terminator. One is supplied with every IIfx system. If you are installing a Coolscan, do *not* use the gray terminator that ships with Coolscan to terminate a IIfx system. Doing so may result in damage to your Macintosh’s motherboard.

3. You may wish to eliminate all non-essential items from the SCSI chain and try restarting again.

4. You may have to rearrange your SCSI devices and cables on the SCSI chain until you find a combination that works.

5. You may have to remove SCSI devices with DB-25 connectors.

6. You may need to contact the vendors of your other SCSI devices to determine if they are internally terminated. Generally, you should not have more than one terminated device on your SCSI chain. Certain devices and arrangements may require more than one terminator. However, these instances are rare.

You should contact Nikon Technical Support if you are experiencing severe difficulty and have worked through the preceding corrective steps without success.

- **Problem: The scanner is not found by the Nikon Scanner plug-in.**

Action: Attempt to locate the scanner on the SCSI bus by first clicking on the Tools icon. Once inside the Tools dialog, attempt to manually address the scanner by clicking on the SCSI icon and the ALWAYS FIND DEVICE button. Once you have determined the scanner's SCSI address, set that address in this dialog, click the DONE button, then set the scanner's defaults.

- **Problem: The plug-in fails to find the scanner when I click FIND DEVICE.**

Action: Proceed with the following corrective action:

1. You may need to power on all of your SCSI devices *before* starting your computer. If this fails to correct the problem, the scanner may be defective, or you may have a rare conflict on your SCSI bus.

2. You may have two SCSI devices set to the same SCSI ID number, such as the Nikon scanner and an external hard drive. Make sure that no two SCSI devices are set to the same SCSI ID number.

3. Try starting your Macintosh with the Shift key held down (System 7) in order to disable all of your Extensions. Then, try using the scanner. If the scanner functions normally, you should examine the contents of your Extensions and Control Panel folders to make sure that you don't have outdated or incompatible software. "Inits" used with some removable cartridge drives may cause SCSI difficulties. Some utilities that display the active drive number may also cause problems.

It is best to start with nothing but Apple-issue system files installed. Have your scanner up and running, then start reinstalling your accessory files. You may need to change the order in which these files are loaded. You can do so by adding an "A" or a "Z" to the very beginning of the file name to change the loading order (Apple system software loads these files in alphabetical order).

- **Problem: I can't find the Nikon Scanner plug-in in my third-party application software.**

Action for Adobe Photoshop 2.01 Users: All plug-ins (including Nikon's) must be in the same folder as the Photoshop Prefs files, "PS Prefs." If the ACQUIRE menu is not available, locate *all* copies of the PS Prefs file, delete them, and *empty the trash*. If the trash is not emptied, Photoshop will follow the PS Prefs file to the trash and use it!

The next time you start Photoshop you will be asked where the PS Prefs file is. Click on the NEW button and then SAVE the new PS Prefs file into your Photoshop plug-ins folder. You should then be able to find the Nikon Scanner plug-in in the ACQUIRE menu.

Action for Adobe Photoshop 2.5 Users: Using the PREFERENCES menu in Photoshop, set the proper plug-in folder.

Action for ColorStudio Users (Version 1.5 or later): Hold down the Command key when launching ColorStudio. You will be asked to identify your plug-in folder. Once you copy the Nikon Scanner plug-in to this folder you will be able to scan directly into ColorStudio.

- **Problem: I can't get the software installation to finish.**

Action: You may have an extension conflict. Restart your Macintosh with the Shift key held down, then run the Installer again.

- **Problem: When I attempt to run the Nikon Scanner plug-in software through Fractal Design Painter I can't activate any buttons.**

Action: Before attempting to use the Nikon Scanner plug-in with Painter close all open windows and palettes.

- **Problem: When I try to scan negative film on Coolscan I get an error 32208.**

Action: The strip film holder is not inserted properly. Remove, then re-insert the film strip holder, making sure that it is in firmly.

- **Problem: My Centris 610/650/660AV or Quadra 800/840AV 'hangs' at the**

completion of a scan.

Action: Version 4.0 of the Nikon Scanner plug-in software will not operate properly on these particular systems. Check your distribution diskette for the version number, then contact Nikon for a software update.

- **Problem: I can't open TIFF files created by Coolscan Control in other applications.**

Action: Use *Nikon Control* for saving TIFF files. TIFF files created in Coolscan Control can only be opened by Photoshop 2.0.1.

- **Problem: When I open the Nikon Scanner plug-in for my GPIB scanner my system locks up.**

Action: Check the version number of your NB-Handler. Version 4.4 of the NB-Handler is not compatible with Nikon products. Contact National Instruments at 1-800-433-3488 to obtain a later version.

- **Problem: If I open SCSI Probe or other software that lists SCSI devices while scanning in Photoshop 2.5, the scan stops.**

Action: When scanning in the background, do not use software that sends an Inquiry on the SCSI bus. This would include SCSI Probe, most disk utilities, and back-up software.

Troubleshooting – Windows

Following are some common problems you may encounter in the installation of your scanner. Corrective action for each problem is listed by order of most likely cause. If a corrective action does not solve the problem, proceed to the next listed corrective action. If the problem persists after exhausting all of the suggested corrective actions, contact Nikon Technical Support at (516) 547-4311, or via FAX at (516) 547-0305 for assistance. Nikon Technical Support can also be contacted through the following electronic information services at the corresponding addresses:

AppleLink	Nikontech
PressLink	Nikon.Tech
America Online	Nikontech
Internet	Nikontech @ AOL.COM

- **Problem: The Nikon Software Installer reports that it cannot read my third-party application disks during the installation, but when I run the third-party installer outside of the Nikon Installer the disks are read with no problem.**

Action: This problem is due to an error in reading different density media. We advise you to install your third-party software first, then update the scan drivers with the Nikon Installer disk.

- **Problem: My system won't boot after I install the SCSI controller card in my PC or compatible.**

Action: You have an interrupt conflict. For Coolscan, refer to the section in the Installation Guide on setting the SCSI card configuration, which will direct you on how to assign one of three possible interrupts to your SCSI host card. For LS-3510-AF/LS-3500, refer to the technical guide accompanying your particular SCSI controller card.

You may have a conflict with a video card driver, or a driver from another installed hardware device. The SCSI controller card accompanying Coolscan will run in a large number of PCs with no change in settings required.

Please contact Nikon Technical Support if you are unable to resolve the problem.

- **Problem: When I launch Microsoft Windows I am returned to the “C:” prompt.**

Action: Windows may not be properly installed. Try launching Windows with the following command: “Win/s.” If Windows runs in standard mode, you should reinstall it, as well as your other drivers. Also, make sure your system is properly configured to use the 386 enhanced mode.

- **Problem: I’ve installed the Nikon Scanner Drivers in my Aldus PhotoStyler and now I can’t use my other scanner.**

Action: PhotoStyler can only support one scanner driver at a time. If you have sufficient disk space, create a duplicate of the PhotoStyler directory. Then, set up one copy for the Nikon scanner, and use the other copy for your other scanner.

- **Problem: My Coolscan cannot be found by the Nikon Scanner Driver.**

Action: Check the messages displayed on your screen as your system is first starting up. Pay particular attention to the Trantor ASPI driver. It should indicate the SCSI ID and type of device as it is loading. In the unlikely event that Coolscan has not completed the power-up diagnostics, you may need to reboot your system so that Coolscan is recognized. Please contact Nikon Technical Support if this occurs.

Action: Check that you have all cables firmly attached to Coolscan.

For *LS-10E* units, it is advised to fasten the connector’s wire clips in order to firmly attach the SCSI cable and terminator to the back of Coolscan. SCSI cables will sometimes ‘walk’ away from the connector, leaving the impression that the cable is firmly seated, while in fact, it is not.

For *LS-10* units, make certain that the SCSI ribbon cable has not been punctured or crushed when you reinstalled your PC’s case. Assure that the SCSI ribbon cable is firmly seated at both ends. Check the position of the configuration switch for termination “ON,” as indicated in Figure 3.4 in Chapter Three of the Coolscan Installation Guide.

- **Problem: Scanning is very slow.**

Action: The scanner will provide the best possible performance if enough RAM is available to contain the entire scan. Eight megabytes of RAM will yield reasonable performance. The host application (e.g. Nikon Control, Picture Publisher or Photoshop)

starts to use virtual memory when there is no more RAM available. In this case, you will notice an increase in disk activity and a decrease in overall scanning speed.

- **Problem: My SCSI hard disk is unreliable since I installed Coolscan.**

Action: You should be interfacing Coolscan with the included SCSI controller card. Nikon cannot guarantee compatibility with every ASPI-compliant SCSI controller card and hard disk driver software. You will not see any speed increase by using a different SCSI controller card, as the included SCSI card can receive image data faster than Coolscan can generate it.

- **Problem: I get a system error when I'm scanning.**

Action: Make note of the exact error message that appears, then contact Nikon Technical Support. It will help if you have the following file information in front of you before you call:

Contents of:
Config.sys
Autoexec.bat
Win.Ini

- **Problem: I am getting an error code 203 or 208 while scanning with Coolscan.**

Action: Enable the jumper on the Trantor T-130 SCSI Controller Card for “Zero Wait States” and/or assign an interrupt. Please contact Nikon Technical Support if you require assistance.

- **Problem: Communication with my internally-mounted Coolscan seems erratic.**

Action: Contact Nikon Technical Support for instructions on enabling termination power on Coolscan internal models.

Glossary of Computer Imaging Terms

A/D Conversion	analog to digital signal conversion.
absolute address	the x and y pixel coordinates in a pixel map using global coordinates in a locally cropped area of a larger image.
analog gamma function	a non-linear function used in analog signal processing.
aspect ratio	the ratio of width to height in an image.
analog signals	these electrical signals represent or are “analogous” to real world events such as a sound or pattern of light. An “analog” is a simile or representation of something else.
ASCII	a coding system used to represent characters using binary storage.
aband sequential	color pixels stored in separate planes in the same file, or as separate files. Sometimes called planar, screen, or field sequential.
binary	a number system which uses a base of two. Used for the majority of computing systems, since electrical logic circuits are easily constructed with a small positive (+) voltage to signify On, or True, and a negative (-) or 0 voltage used to represent Off or False.
bit	A binary digit representing 0 or 1, true or false, plus or minus.
binary images	these are high contrast, bit-mapped images, used to represent line art and typography.
byte sequential	color stored in triplet pixels for RGB, HSV, etc., or quadruplet pixels for RGBA, YMCK, etc.
buffer capacity	the available space to store information in any system. “Buffer” usually refers to intermediate storage for processes that would otherwise bottleneck a system.

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bus	a parallel connecting scheme for multiple devices.
calibrate	to measure the results of the imaging process on a known color/gray scale target and real life subjects. This quantitative measurement is called sensitometry, where we measure the values of the input and output. We can then define a function for the changes that are introduced by the imaging system. This transfer function can then be used to "calibrate" the imaging system.
CCD	charge-coupled device. This is a solid state memory unit with storage cells that can accumulate electron charges.
CCD gain	the voltage gain on the CCD in the scanner.
clamping level	the lower voltage limit of the CCD output can be clamped at a particular point, allowing the black level of the image to be established so that regardless of the exposure increase, the black level stays the same. This is a non-linear type of amplification.
CPU	central processing unit.
cropping	trimming an image.
color correction	the process of balancing the color of an image.
color models	<p>there are many ways to describe color. Color spaces are three dimensional, that is they consist of units of measurement along three different axis. We generally talk about three common characteristics.</p> <ol style="list-style-type: none">1) Luminance (brightness, lightness, darkness, or value): the color's shade from dark to light.2) Chrominance (chroma, color, hue): the color's name.3) Saturation (purity, degree of gray contamination): the color's strength or intensity resulting from the quantity of neutral or gray that is mixed with the color. <p>The common color spaces are: RGB, YMC, YMCK, HSV, HSL, HSI, YUV, YIR, CIE, L*a*b, CIE, L*u*v, etc. Colors can also be</p>

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	specified using Pantone®, just one of many color matching systems.
contrast	the difference between the lightest and darkest shades in a picture. The slope of the function of exposure versus density is, in effect, the contrast, also called gamma.
decimal	a number system which uses a base of ten. First appeared as the Arabic number system, it also includes various types such as integers, real and imaginary numbers, etc.
daisy chain	a series of devices connected together with a beginning and end-point, unlike an endless loop.
digitized	the process of converting a continuously variable signal into a quantized representation, usually binary.
DIP switch	dual in-line pin switch.
dither	to mix different tonal values or shades together in a pattern to smooth the transition between two different tonal areas. To create the appearance of more gradations by blending small components of different shades alternately together.
dither pattern	a two-dimensional matrix used in the dithering process. This commonly measures from 2x2 up to 8x8 cells, with different values in each cell. As the dither matrix grows, more shades can be simulated, but the image will appear less and less defined (sharp) as small details of high contrast pixels are spread over a wider area.
driver	an intermediate software or firmware controller for various input/output devices connected to a computer, and the application running on it.
emulsion	The light sensitive coating in photographic film or paper. The side of the film bearing the emulsion or image layer is usually slightly matte (non-reflective) when viewed with an oblique light source, compared to the base or non-emulsion side. Can also be determined from the readability of the manufacturers identification markings. When these ID's are readable, the emulsion side is facing away from you.

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four-color process	the use of four subtractive pigment-based primaries, Yellow, Magenta Cyan, and black, to reproduce the full spectrum in print. Can also be achieved with three color process, Yellow, Magenta, and Cyan, which are the complement (opposite) to the three additive primaries, Blue, Green, and Red.
exposure shift	a change in a lighter or darker direction.
GCR	gray component replacement is the use of black ink to substitute for common quantities of colored inks. In other words, when the print has a large gray area that is being reproduced using approximately equal quantities of cyan, magenta, and yellow ink, the common component of the three colors can be replaced with a similar density of black ink. Also called 'achromatic' reproduction.
gray balance	the relative proportion of primary colors, additive or subtractive, needed to produce a neutral tone from dark to light intensities.
HEX or (h)	a number system which uses a base of 16. Where we use the first ten numbers in the arabic system and continue on with letters: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F.
hue	a discrete, fully saturated color, is given a name. This name is its "hue". The same hue is referred to by different descriptors depending on the color model being used.
handshaking	the process of acknowledging transmission and reception of data through hardware or software.
interleaved	refers to a color pixel storage structure where the RGB elements of the pixel are all present in consecutive order at one memory location for that pixel. Non-interleaved or planar means that the red, green and blue pixels are stored in different planes or files. See band sequential, byte sequential, line sequential, full chunky, chunky planar, and full planar.
irradiation	photons entering a light sensitive film emulsion tend to 'bounce

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	around' resulting in diffusion of sharp lines and loss of definition. This can be minimized with thinner emulsions and a light absorbing base under the sensitized layers.
high-key	describes an image where most if not all of the subject matter has a density range from midtones to highlights. A predominantly light picture.
line-sequential	where color is stored in RGB, YMCK, etc. lines of pixels instead of bytes or planes. Sometimes called row sequential for a horizontal raster.
luminance	see color models.
low-key	describes an image where most if not all of the subject matter has a density range from midtones to shadows. A predominantly dark picture.
LUT	look-up-table — used to transpose one value into another via some predetermined scheme.
LSB	least significant bit — the right-most bit in a binary code.
mapping	assigning colors to particular areas of an image based on shade or some other description. Often used to produce visually continuous tone color images when there are very few colors available in the palette to do so.
moire	an undesirable visible interference pattern created when dot screens overlap at certain frequencies. This pattern can be eliminated (subdued) through trial and error and compromise. The angles and frequencies of the four process screens must be manipulated to reduce the effect.
MSB	most significant bit — the left-most bit in a binary code.
Photometry	the process of reading densities through photoelectric conversion.

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	Also related to sensitometry or densitometry which can also be performed using visual matching.
pixel	the smallest discrete element in a picture, usually square, in a digital system. Short for picture element. These elements can also be irregular shapes and randomly spaced like silver halide grains in a photographic emulsion. Also called pel.
PostScript®	a page description language authored by Adobe Systems. It is used extensively in the desktop publishing industry to translate digitally stored images, raster and object types, to a raster-oriented printing device, such as a laser printer or laser typesetter.
progressives	a four color ink proof made on press, where each plate is printed separately and in various combinations with the other three so that the four color images can be properly evaluated for dot gain and the overall quality of the color separations. Also called “progs”.
prescan	photometry performed by the scanner before a screen preview.
pseudo-color images	when colors are assigned to monochrome shades to give meaning to areas in the picture. Often used in satellite imagery to define vegetation and geological information. Can also refer to simple tinting of monochrome images, like oil-coloring B&W prints.
RAM	Random Access Memory.
raster	a lattice of parallel lines used to represent an image by varying the brightness of points on each line. The raster is a regular pattern of thin, horizontal, equally spaced bars.
refractive index	the factor by which a material, such as glass or water, causes light wave/particles to change velocity. This change in velocity is a change in direction rather than speed, since the speed of light is constant. The result is that light waves change direction when they pass through a boundary from one material, such as air, to another, such as glass or water. This change can be viewed directly, as when a magnifying lens bends light, or when water magnifies the part of an object which is submerged. The change in angle can be calculated from this

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	<p>“index of refraction”. Certain materials having a higher density, will bend light more than others. Different types of glass can possess larger or smaller indices of refraction.</p>
registration	<p>the accurate placement or line-up of discrete image elements, in superimposition such as in multiple pass scanning or four-color printing plate registration. This term is also used to refer to the downloading of commands to the LS-3510AF memory.</p>
resolution	<p>the fine-line definition or resolving power of an imaging system. A measure of optical performance. Also refers to the number of dots or pixels used to define an image. The more dots per unit of measure, the higher the resolution.</p>
reversal films	<p>film emulsions that have been designed to be exposed and developed as a negative, and then reversed by chemical or light-induced fogging, to produce a positive image from the unprocessed portions of the negative. The negative image is then bleached away, leaving a positive silver layer for black and white, or three silver layers with color couplers for a color image. For color, the silver is bleached away, leaving the color couplers which are then developed out to become color dyes.</p>
screen	<p>a lattice of lines used to create mechanical halftones in the photographic process. These halftones are mostly generated digitally these days.</p>
shading compensation	<p>the CCD element normalization process in the scanner which compensates for different CCD element sensitivities to light in a linear array.</p>
slice level	<p>the threshold which is used to set a pixel either white or black, when converting from continuous tone or grayscale shaded originals.</p>
slide mount	<p>a paper or plastic frame used to hold film for projection or viewing purposes.</p>

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stage	the moving platform used to mount the slide or film strip holder in the scanner.
subsampling	the process of reducing the number of discrete pixels in an image by throwing certain ones away or averaging several together to form a single one.
tone wedge jump	posterization caused by having too few bits to represent the number of tones needed in an image.
vector conversion	the conversion of information from scalar to vector. Vector information is defined as having magnitude and direction. In other words, a point in space can be defined in a cartesian coordinate system, and there is a vector pointing towards that location in space. In imaging, we can convert a pixel from a value at a particular x, y location, to a vector number which defines its magnitude as well as its spatial location in one number. This system is used extensively to mathematically represent randomly shaped objects so that computers can “draw” them.

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