Nikon

TWAIN Driver

Nikon Scan Windows

User's Manual

Contents

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1. Overview

Thank you for purchasing your Nikon scanner. This manual explains how to use Nikon scanners with Nikon Scan Windows for IBM PC/AT or compatible computers. Please read the documentation thoroughly to ensure proper operation and the best results from your scanner.

Note for Windows 95 users: *The instructions in this manual are based on the Nikon Scan Windows 3.1 version. The dialog boxes of the Windows 95 version differ from those of the Windows 3.1 version.*

Nikon Scan Windows conforms to the TWAIN scanner interface specification, and provides the following functionality:

- Nikon Scan Windows supports the AX-110 (ScanTouch 110) and AX-210 (ScanTouch 210) flatbed scanners and the LS-20 (COOLSCAN II), LS-1000 (SUPER COOLSCAN), and LS-4500AF film scanners. The AX-1200 flatbed scanner is not supported by Nikon Scan.
- Scanners supported by Nikon Scan can be operated by launching the Nikon Scan TWAIN driver from the Nikon Control Windows application provided with this product.
- Scanners supported by Nikon Scan can also be operated by launching the Nikon Scan TWAIN driver from the acquire menu within other applications compatible with Acquire plug-ins, such as Adobe Photoshop.
- With the optional AF-10 Auto Document Feeder mounted on the AX-110 or AX-210 or the optional SF-100 Auto Slide Feeder mounted on the LS-1000, images can be automatically and sequentially scanned by launching this software from within the Nikon Control application. Consecutive and automated scanning might also be supported by other imaging applications, but Nikon cannot ensure complete compatibility.

Note: *The operating procedures for the LS-20 and LS-1000 are identical except that the LS-20 does not support the optional Auto Slide Feeder. Differences between these scanners and the LS-4500AF are described in Appendix A, Features Specific to the LS-20 and LS-1000, and Appendix B, Features Specific to the LS-4500AF. Features specific to the AX-110 and AX-210 are described in Appendix C. Please be sure to read the appropriate appendix for the scanner you are using.*

Note: *The illustrations in this manual are based on the windows and menus displayed when the selected scanner is the LS-1000. Depending on the scanner selected, the items displayed in Nikon Scan's Main dialog box and its associated menus may differ slightly from those shown here. Please consult the appropriate appendix for the scanner you are using.*

2. Before You Begin

2.1 System Requirements

Nikon Scan Windows 3.1 version

To run Nikon Scan Windows 3.1 version, the following minimum hardware and software is required:

- IBM PC/AT or compatible with i386SX or better
- MS-DOS 5.0 or later
- MS-Windows 3.1 or later
- 8MB or more of RAM
- 1MB or more of hard disk capacity (a 300MB or larger hard disk is recommended)
- SCSI board with ASPI driver (Adaptec 1505 and 2940 are recommended.)
- VGA (640 x 480 pixels) monitor or better
- Monitor with 16.7M colors, 64K colors, 32K colors, 256 colors, 256 grayscale, 16 grayscale

Nikon Scan Windows 95 version

To run the Windows 95 version of Nikon Scan, the following minimum hardware and software is required:

- IBM PC/AT or compatible with i386DX or better
- MS-Windows 95
- 8MB or more of RAM
- 1MB or more of hard disk capacity (a 300MB or larger hard disk is recommended)
- SCSI board with ASPI (Adaptec 1505 and 2940 are recommended.)
- VGA (640 x 480) monitor or better
- 8-bit or more of video card and monitor with 16.7M colors, 64K colors, 32K colors, 256 colors

2.2 Software Installation

The Install disk provided with this product contains the Nikon Scan Windows TWAIN driver and the Nikon Control Windows application.

To begin using the Nikon Scan TWAIN driver, you must first install Nikon Scan, as described in the Installation section of the Nikon Control manual provided with this product.

Nikon Control is easy-to-use application that acquires images from the scanner via the Nikon Scan Windows TWAIN driver. Use Nikon Control to scan a number of images consecutively with an optional autofeeder attachment fitted to the AX-110 or AX-210 flatbed scanners or to the LS-1000, or use it as your basic scanning application, if you do not have any plug-in compatible software available. The procedures for using Nikon Control are covered in the *Nikon Control Windows User's Manual*.

3. Basic Operations

Connect the scanner as described in the hardware manual. First turn on any peripheral devices, including your scanner(s), then turn on the PC.

If you are using a Nikon film scanner, be sure to always remove the strip film holder from the film slot before turning the scanner on.

Refer to the hardware manual provided with the product for details on how to insert and position the media to be scanned.

If an SCSI board has not been installed, install one as described in the directions supplied with the board. When installing the SCSI board for the first time, be careful not to set I/O addresses, interrupt numbers, and DMA channels that conflict with the I/O, interrupt and DMA settings of other cards, such as video graphics adapters, and so on. Before installing the SCSI board in the PC, confirm that the PC is powered off.

3.1 Launching and Quitting

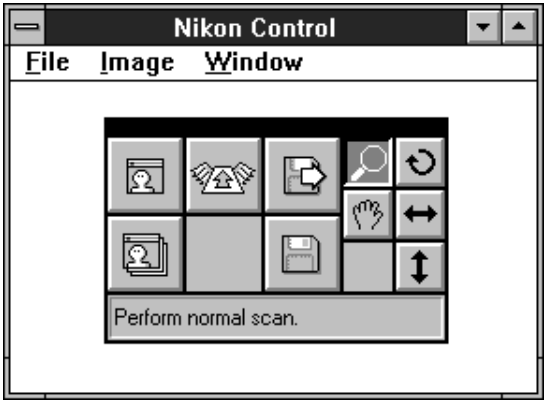
The Nikon Scan Windows TWAIN driver can be launched from an imaging application, or from within Nikon Control, as described in detail below.

Launching

Step 1

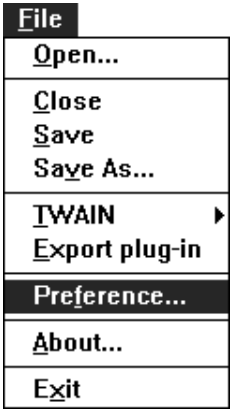
Start up Windows 3.1 and launch Nikon Control.

After Nikon Control is launched, the following **Control palette** appears in the Nikon Control window.

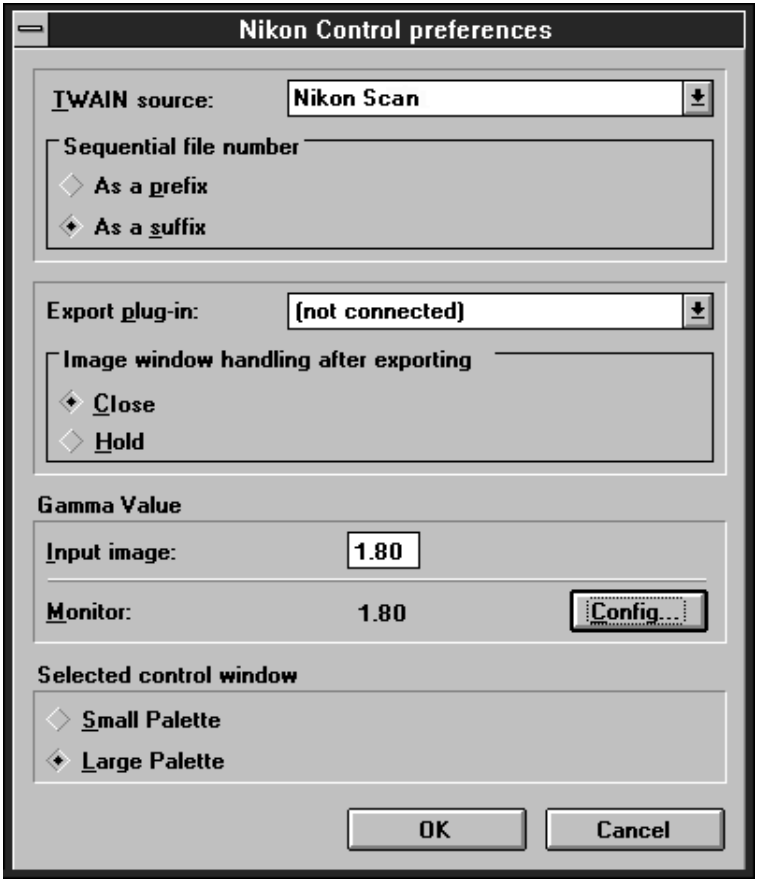


Step 2

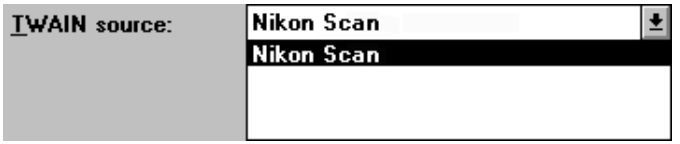
Select the TWAIN driver by choosing **Preference…** from the **File** menu.



The Nikon Control Preferences window appears.

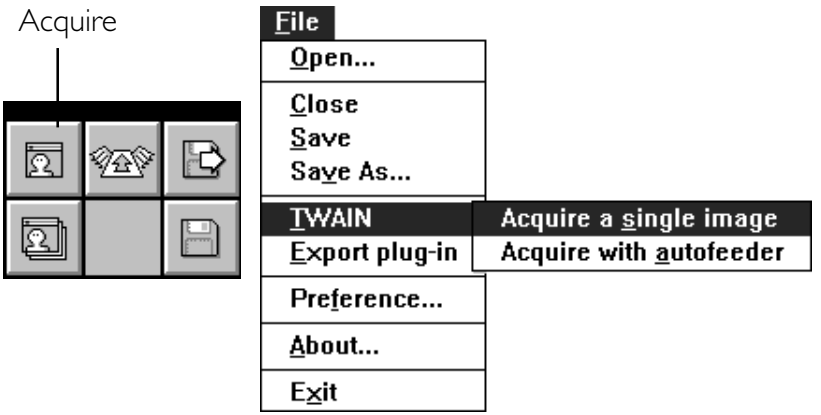


Select the required TWAIN driver from the **TWAIN Source** pop-up menu.

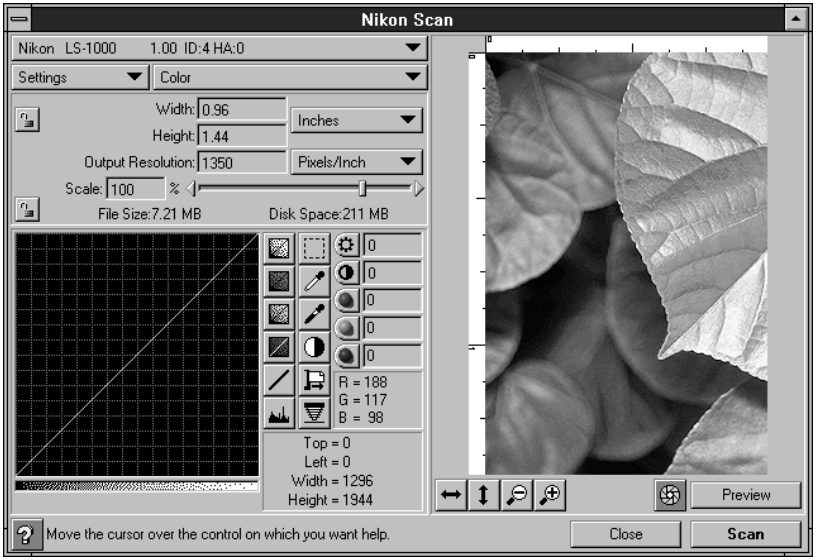


Step 3

Click the **Acquire** button on the Control palette, or choose **Acquire a single image** from the **File** menu.



The Nikon TWAIN Source window will appear.



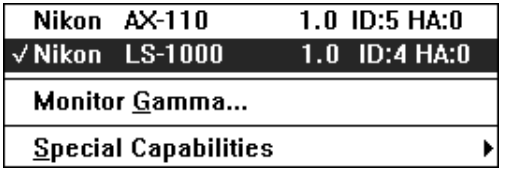
Quitting

Clicking the **Close** button in the Nikon TWAIN Source window will return you to Nikon Control, or to your current imaging application.

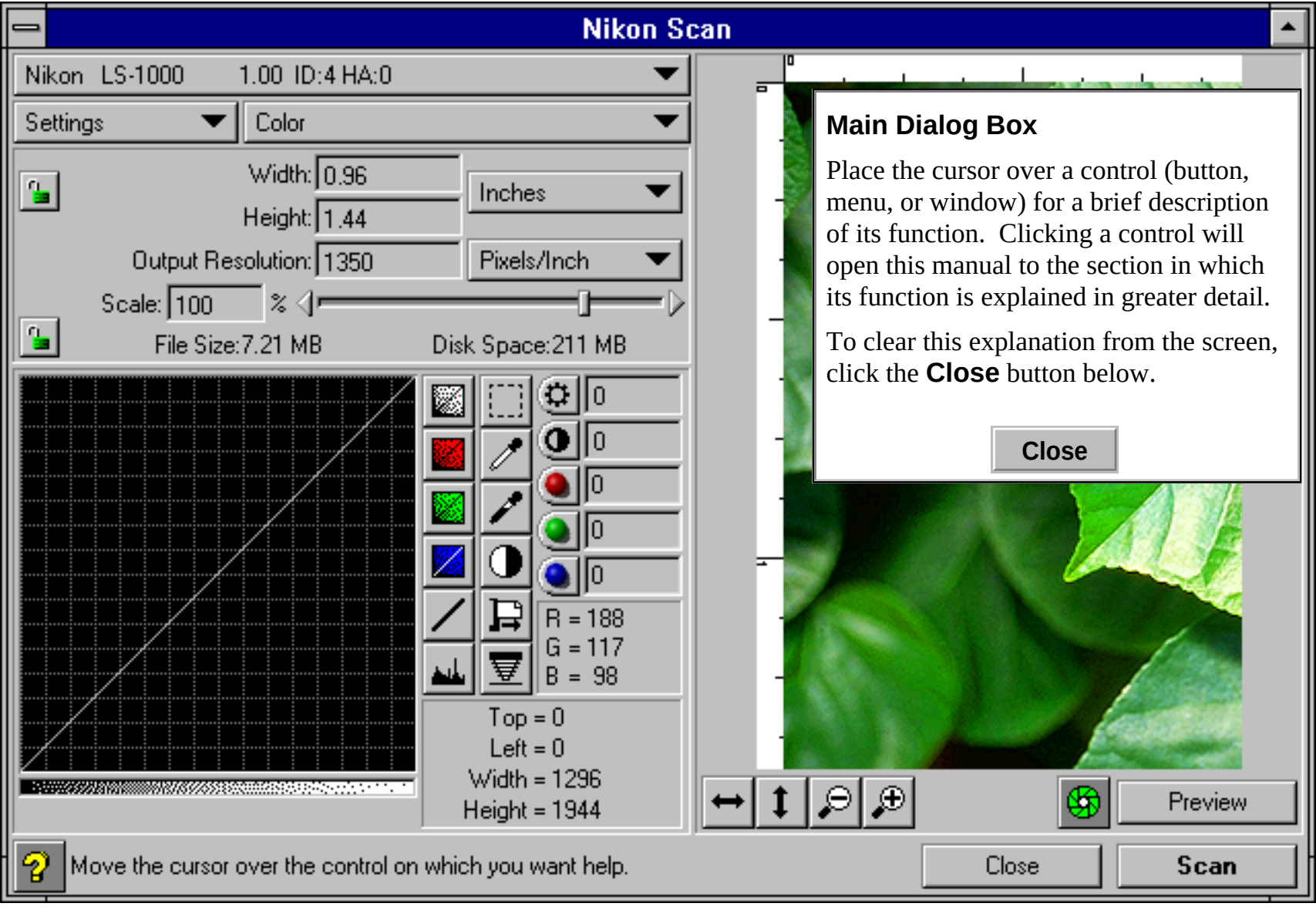
3.2 Main Dialog Box

Nikon Scan will automatically detect which scanners are connected, and display the Main dialog items and menus appropriate for the scanner you select. (The Main dialog box items will vary slightly, depending on the selected scanner.)

If multiple Nikon scanners are connected and powered on, first choose the scanner you are going to use from the pop-up menu at the top left corner of the Main dialog box. Only scanners supported by Nikon Scan will be visible in this pop-up menu. HA is an abbreviation for "Host Adapter", and the number next to it is the SCSI ID of the scanner.

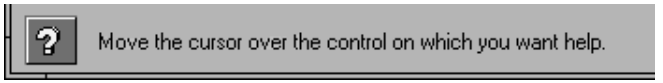


Note: *Depending on what devices are actually connected to your computer, the options which will appear in the pop-up menu above may differ from those shown here.*


Nikon Scan
Nikon LS-1000 1.00 ID:4 HA:0
Settings
Color
Width: 0.96
Height: 1.44
Inches
Output Resolution: 1350
Pixels/Inch
Scale: 100 %
File Size:7.21 MB
Disk Space:211 MB
0
0
0
0
0
R = 188
G = 117
B = 98
Top = 0
Left = 0
Width = 1296
Height = 1944
Main Dialog Box
Place the cursor over a control (button, menu, or window) for a brief description of its function. Clicking a control will open this manual to the section in which its function is explained in greater detail.
To clear this explanation from the screen, click the Close button below.
Close
Preview
Move the cursor over the control on which you want help.
Close
Scan

Interactive Help

Clicking the Help button at the bottom left of the window activates the Interactive Help function. Passing the cursor over a window item automatically displays appropriate Help text in the message display area.



The Interactive Help display disappears when the Help button is clicked again.

Control Menu

The Control menu offers the following functions;

Restore:	Restores the Main dialog box to its original size when it has been enlarged with the **Maximize** command
Move:	Lets you move the Main dialog box
Size:	Lets you re-size the Main dialog box
Maximize:	Enlarges the Main dialog box to fill the screen
Close:	Closes the Main dialog box
Switch To…:	Lets you activate another window
About…:	Displays the About window

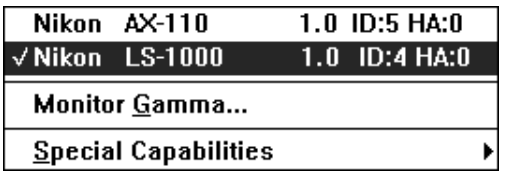
3.3 Basic Scanning

This section gives a brief description of the standard acquisition procedure after the Main dialog box is displayed. The individual buttons and menus are explained in detail in the following chapters.

Choosing the Scanner

Nikon Scan will automatically detect which scanners are connected, and display the Main dialog items and menus appropriate for the scanner you select. The Main dialog box items will vary slightly, depending on the selected scanner.

If multiple Nikon scanners are connected and powered on, first choose the scanner you are going to use from the pop-up menu at the top left corner of the Main dialog box. Only scanners supported by Nikon Scan will be visible in this pop-up menu.



Note: *Depending on what devices are actually connected to your computer, the options which will appear in the pop-up menu above may differ from those shown here.*

Positioning Media

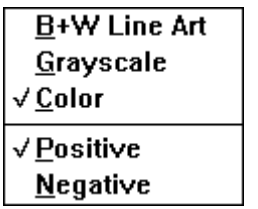
Insert or position the media to be scanned as described in your scanner's hardware manual.

Ejecting Film (film scanners only)

To eject film, click the button shown below. If you are using the optional SF-100 Auto Slide Feeder with the LS-1000, clicking this button will eject the current slide and set the next one. If you are using the LS-4500AF, you can also eject film by pressing the scanner's Eject button.

Media Type

Choose the media type to be scanned.

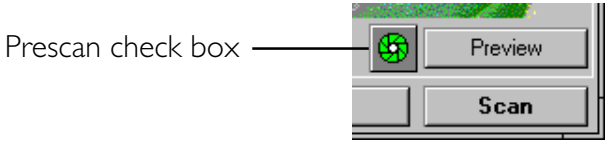


Note: *The above menu may differ depending on the scanner and options used. Please see the appendix appropriate to the scanner you are using.*

Preview

Clicking the Preview button starts a preview operation.

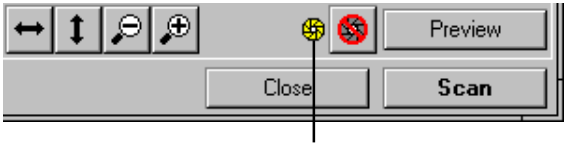
Before the preview process begins, a prescan operation will be carried out if the **Prescan** check box is turned on.



PRESCAN ON PRESCAN OFF

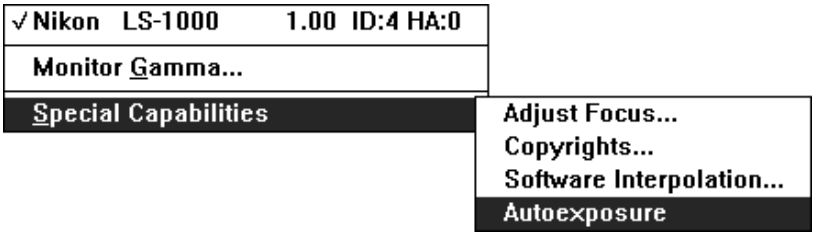
Note: *Even if the prescan check box is turned on, the LS-4500AF will not conduct a prescan operation if the cropping area has not been changed.*

If the **Prescan** check box is turned off when a prescan is required, the following indication will appear.



This indication appears when a prescan operation has not been carried out

In this case you can carry out the prescan operation after the preview is completed by choosing **Autoexposure** from the **Special Capabilities** menu.



Note: *Depending on the scanner you have selected, the options which appear in the pop-up menu above may differ from those shown here. Please see the appendix appropriate to the scanner you are using.*

When the preview operation is completed, an image is displayed in the Preview display area.

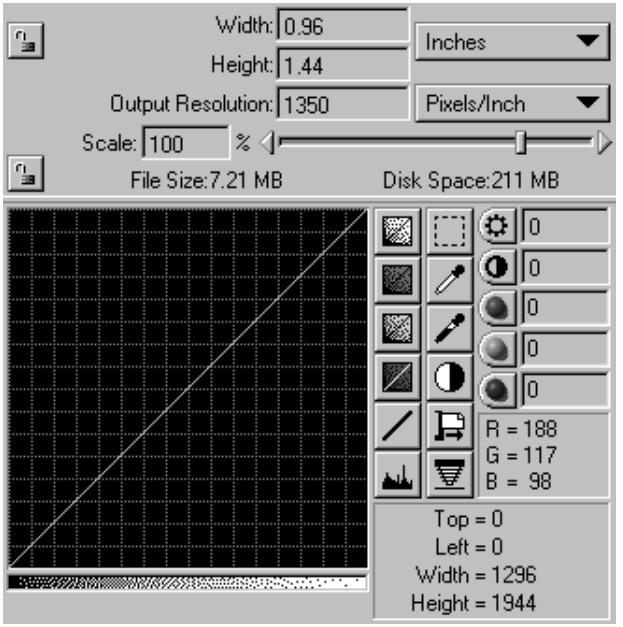
Cropping

Using the mouse, click and drag a bounding box to specify a rectangular crop area in the preview image display area.

Using the four buttons shown below, the image displayed in the preview area by the preview operation can be flipped vertically or horizontally, and enlarged or reduced.

Setting Size, Resolution, and Image Adjustment

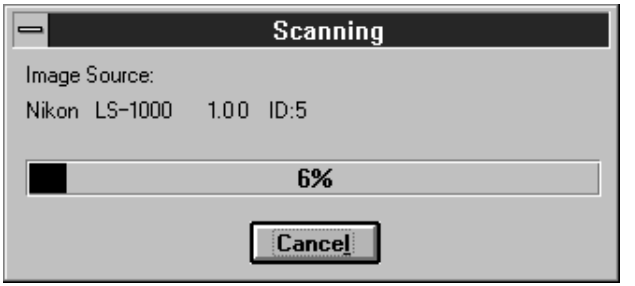
You can change settings such as the resolution, scale, contrast, gamma curve, and other parameters, as required.



Scanning

When the **Scan** button is clicked, scanning is carried out in accordance with the settings made, and the acquired image is passed to the imaging application, or to Nikon Control.

While scanning is in progress, the following window is displayed.



Clicking the **Cancel** button stops scanning.

4. Scanning Conditions

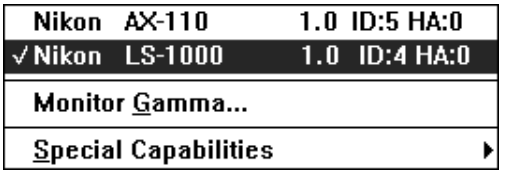
Except where otherwise noted, the operating procedures covered in the present chapter are identical for all scanners supported by Nikon Scan. Features specific to each model are covered in Appendix A, Features Specific to the LS-20 and LS-1000, Appendix B, Features Specific to the LS-4500AF, and Appendix C, Features Specific to the AX-110 and AX-210.

4.1 Choosing the Scanner

Nikon Scan will automatically detect which scanners are connected, and display the Main dialog items and menus appropriate for the scanner you select. The Main dialog box items will vary slightly, depending on the selected scanner.

If multiple Nikon scanners are connected and powered on, first choose the scanner you are going to use from the pop-up menu at the top left corner of the Main dialog box. Only scanners supported by Nikon Scan will be visible in this pop-up menu.

The names and SCSI IDs of the connected scanners are shown in the menu. HA is the abbreviation of Host Adapter, and the number next to it is the ID number of the SCSI board.

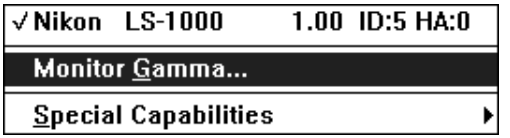


Note: *Depending on what devices are actually connected to your computer, the options which will appear in the pop-up menu above may differ from those shown here.*

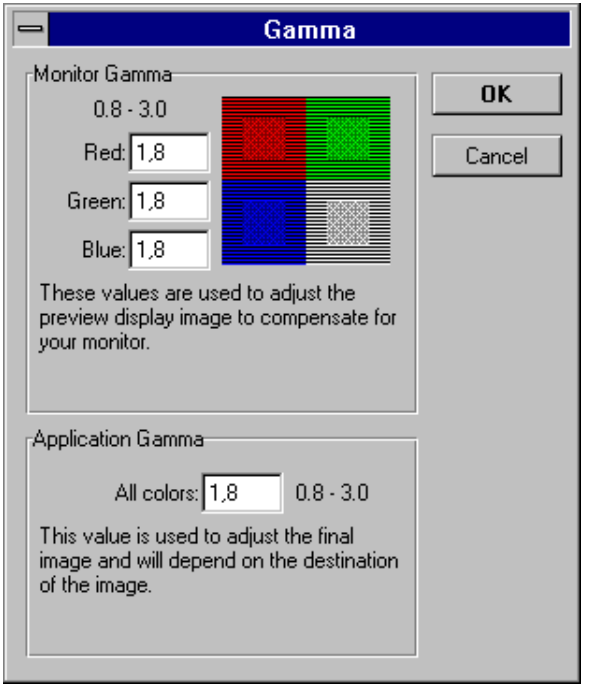
4.2 Setting the Gamma Value

You can adjust the Monitor Gamma values for red, green, and blue, and the Application Gamma value.

When setting the Gamma values, choose **Monitor Gamma…** from the pop-up menu at the top left corner of the Main dialog box.



The Gamma window then appears.



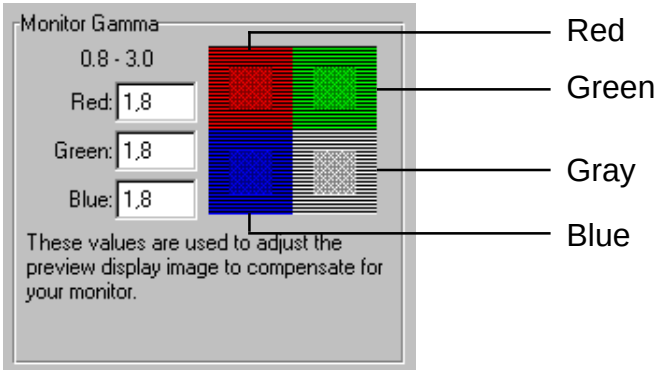
Meaning of the Buttons

Cancel: Discard settings and return to Main dialog box.

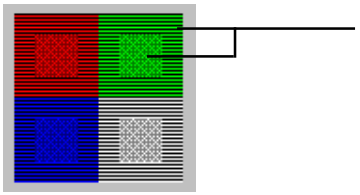
OK: Save settings and return to Main dialog box.

Monitor Gamma

The Gamma dialog box allows you to adjust the appearance of the preview image within Nikon Scan. Changing these values will not modify the actual image data obtained in a scanning operation.



Set the gamma values for each of the red, green and blue patches so that the outer and inner rectangles match as closely as possible.



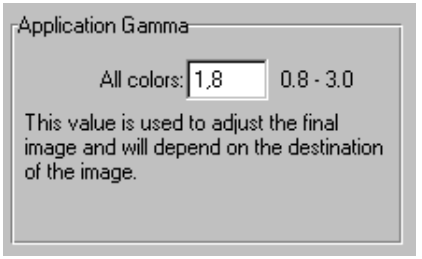
Setting visually matching densities for each pair of color patches should also result in the display of matching inner and outer gray density patches. However, this may not always be the case, depending on the monitor used. You can adjust the match of the gray patches by changing the RGB gamma settings again. However, if you correct the overall density gradation this way, the RGB color balance may no longer be optimally represented on the monitor.

Adjustment range: 0.8 to 3.0

Note: *The monitor gamma values entered here are only used to correct for the display of preview images within Nikon Scan. As these parameters are not used to compensate the display of final scanned images by your host application software, nor for other application software, you should adjust the monitor gamma settings for each application you use with Nikon Scan, with the gamma correction tools provided by those applications.*

Application Gamma

Application Gamma stores a correction value used to process final scanned image data as it is passed from Nikon Scan to the host application.



Adjustment range: 0.8 to 3.0

Note: *In the Windows environment, Monitor Gamma is handled within individual applications, rather than globally by the operating system. Adobe Photoshop provides a Calibration dialog (from the Preferences menu) to set a specific Gamma value. To display image data correctly within Photoshop, the image coming from Nikon Scan must first be compensated. The value entered here will process and adjust the image data through the scanner's 8, 10, or 12-bit LUT (look-up-table), taking full advantage of the bit-depth specification of the scanner model connected.*

4.3 Positioning Media

Insert or position the media to be scanned as described in your scanner's hardware manual.

4.4 Ejecting Film (film scanners only)

To eject film, click the button shown below (this button is not displayed when an AX-110 or AX-210 flatbed scanner is selected). If you are using the optional SF-100 Auto Slide Feeder with the LS-1000, clicking this button will eject the current slide and set the next one.

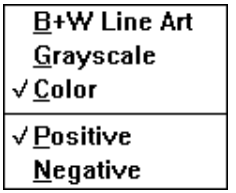
Note: *With the LS-4500AF, you can also eject film by pressing the scanner's Eject button.*

After the film eject button has been clicked, a prescan operation will be carried out automatically.

4.5 Choosing the Media Type

Media Type Selection

Choose the type of media to be scanned.



Note: *The above menu may differ depending on the scanner and options used. Please see the appendix appropriate to the scanner you are using.*

Choose one of the following from the upper part of the Media Type menu.

B+W Line Art: To scan black and white binary images

Grayscale: To scan grayscale images

Color: To scan color images

Choose one of the following from the lower part of the Media Type menu.

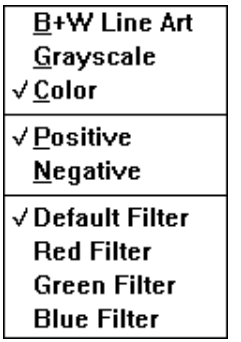
Positive: To scan positive images

Negative: To scan negative images

Filter Selection

With some images good results can be obtained by using a different color filter from the default filter in grayscale scanning, and a filter selection function is provided for this purpose. This function can be used to produce grayscale and B+W Line Art scans, and is useful for 'dropping out' unwanted colors, such as document stains, etc.

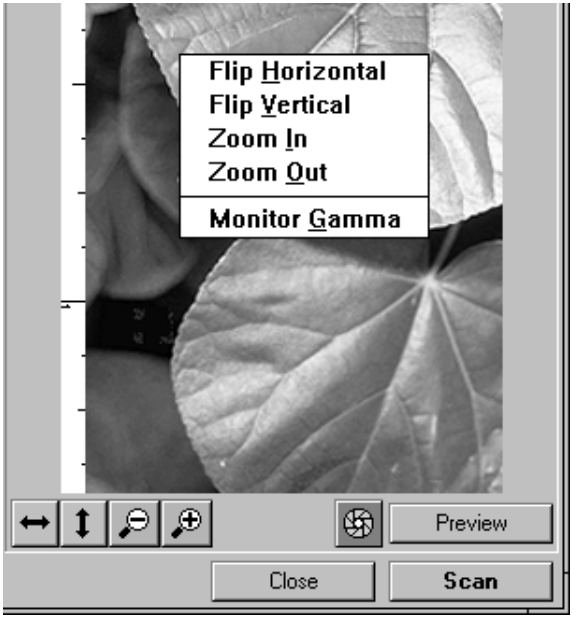
If you pull down the Media Type menu while holding down the **Ctrl** key on the keyboard, the filter selection menu will appear at the end of the Media Type menu.



Choose the filter you want to use from the menu.

4.6 Crop/Preview Area Buttons and Menu

The preview image acquired after clicking the **Preview** button is displayed in the crop/preview area.

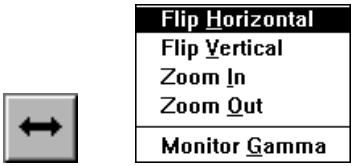


Locating the cursor on the preview area and clicking the right-hand button of the mouse brings up the pop-up menu.

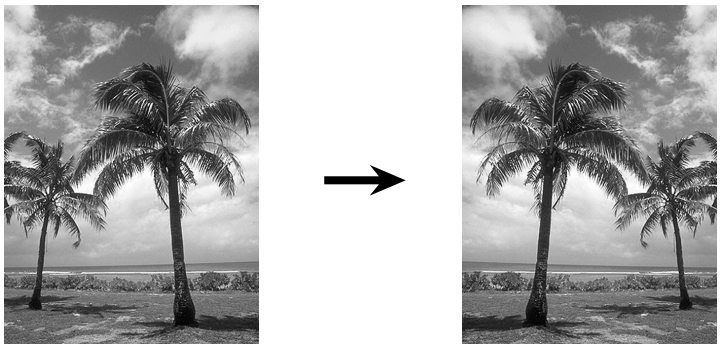
Using the four buttons below the preview area, or selecting the items in the pop-up menu, the image displayed by the preview operation can be flipped vertically or horizontally, and zoomed in or out.

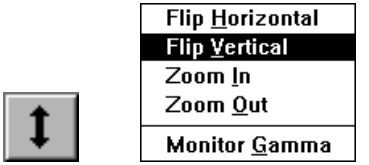
Note: *The pop-up menu contains the* **Monitor Gamma** *item. This function is identical to that of* **Monitor Gamma** *in the pop-up menu at the top left corner of the Main dialog box. For details concerning the Monitor Gamma setting, refer to Section 4.2.*

Flip



The entire preview area display (including any existing crop marquis) is flipped horizontally.

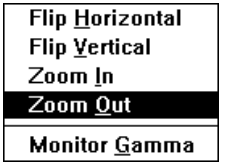


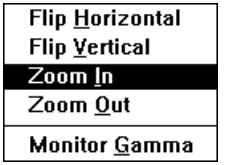


The entire preview area display (including any existing crop marquis) is flipped vertically.

When the original image is flipped horizontally or vertically, the corresponding Flip button appears to have been pressed, and will remain in a depressed position, as shown below. Clicking the button again restores its original appearance.

Zoom





When the Zoom-in button is clicked or the **Zoom In** command is chosen, the crop area fills the entire Preview area. After a Zoom-in operation, the original display is restored by clicking the Zoom-out button or choosing the **Zoom Out** command.

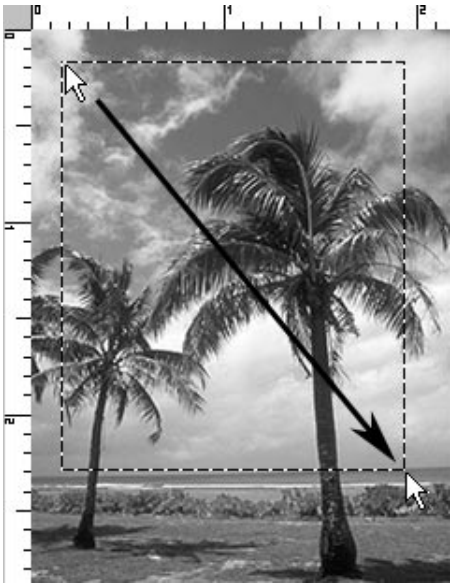
4.7 Cropping

You can use your cursor in the crop/preview area, to set up a new crop, or to move or change the size of the current crop area.

Establishing a New Crop

After the preview image is displayed, locate the cursor at any starting point on the preview (the top left is shown in the example), and then drag the cursor to another location (bottom right in the example), thus forming a rectangle, which is referred to as 'marquis' of 'marching ants'.

Note: *'Dragging' means moving the mouse while holding down the mouse button.*

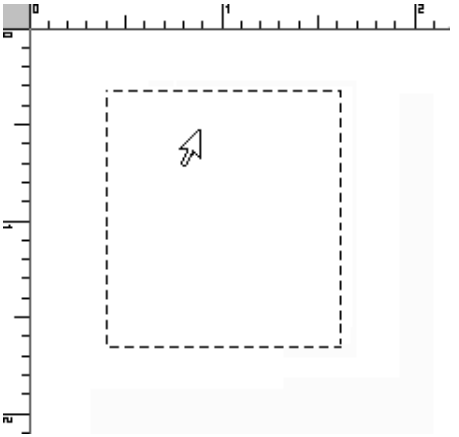


The entire preview area can be re-selected by double-clicking anywhere in the preview window.

Note: *For reasons involving the compression and display of the preview image, there may be a slight difference between the crop area specified on the screen and the area that is actually scanned. When cropping an image, allow sufficient safety margin to ensure that important element are not cropped out.*

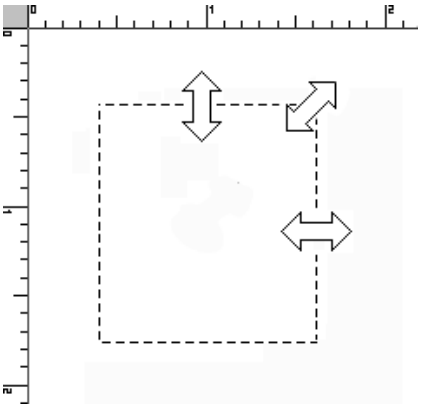
Moving the Crop Area

To change the position of the crop rectangle, simply locate the cursor so that it is inside the frame and then drag the frame to the desired position.



Changing the Size of the Crop Area

To change the size of the crop area, drag a side or corner of the crop frame. When a side is dragged, the area will change only in the vertical or horizontal direction. When a corner is dragged, the size of the area will change both vertically and horizontally. Note the type of cursor used for each change.

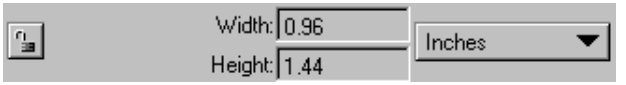


4.8 Crop Size Controls

These controls let you set the output size, output resolution, and scale.

Dimensions

The scanned output size can be specified by entering width and height values. If an unacceptable value is entered, it will be displayed in red. When the size is changed by cropping the Preview, the numbers displayed in the size value edit boxes will also change at the same time.

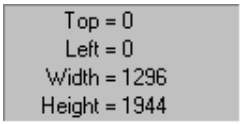


The units for width and height can be selected from the pop-up menu. When this selection is changed, the values in the boxes are converted to the equivalent new units.

Selection	Unit
Pixels	Pixel
Inches	Inch
cm	Centimeter
mm	Milimeter
Picas	Pica
Points	Point

Note: *If the unit is changed, the ruler and location display also change accordingly.*

Cropping Coordinates



The location of the current crop is given by the absolute numerical position of its top and left sides. The distance, in pixels, from the top to the bottom of the crop is displayed as the pixel height, the distance from the left to the right side of the crop as the pixel width. These coordinates are displayed in pixels, regardless of the units selected for Width and Height (and corresponding ruler display) in the size control area.

Output Resolution

Enter the desired resolution in the "Output Resolution" field in the dialog box in order to set the output resolution. The resolution specified here refers to the output resolution of the scanned image; enter a value suitable for the final purpose of the scan.

If an unacceptable value is entered, it will be shown in red.

The units for resolution can be selected from the pop-up menu. When this selection is changed, the value in the box is converted to the new units.

Selection	Unit
Pixels/Inch	Pixels/Inch
Pixels/cm	Pixels/Centimeter
Pixels/mm	Pixels/Milimeter
Pixels/Picas	Pixels/Pica
Pixels/Point	Pixels/Point

Scale

'Scale' means the relative scale of the output resolution or size, and input resolution or size. If input and output size and resolution are the same, the scale is 100%. The Scale value can be specified either by entering a value or by dragging the slider with the mouse. If an unacceptable value is entered it will be shown in red. The Scale is always shown as a percentage increase from the original size, to the final scanned size.

Modifying the size of the crop rectangle while the width and height aspect ratio is locked will change the Scale value, not the final output width and height values.

File Size and Disk Space

The file size and amount of free disk space are shown below the Scale.

Note: *If the file size calculated from the size, resolution, and scale settings is too large to be saved within the available disk space, the value will be highlighted in yellow.*

Note: *You should check the File Size and Disk Space available before starting a final scan. If the required space for a scan exceeds the available space, the file size needed will be displayed in highlighted text.*

Padlock Icons

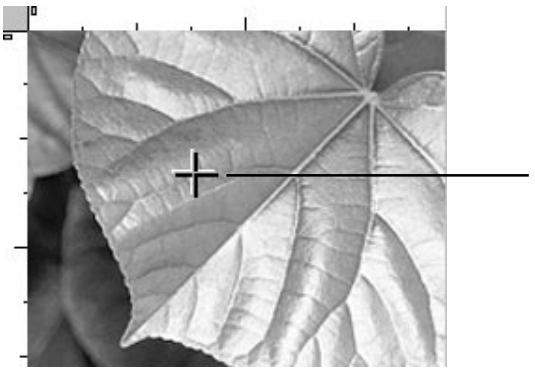
The width/height aspect can be locked by clicking the padlock icon located to the left of the width and height input boxes (the icon will change from green to red when clicked). If a new value is entered for either width or height when the aspect ratio is locked, the other value will automatically be changed to maintain the specified aspect ratio.

The padlock icon to the left of the File Size information item will lock in the file size, permitting the size and resolution to change in proportion to each other without changing the final quantity of scan data—the total number of pixels scanned. Locking file size simultaneously locks the width/height aspect ratio.

4.9 Autofocus (film scanners only)

The focus of the image can be adjusted by clicking the **Autofocus** button shown below (this button is not displayed when an AX-110 or AX-210 flatbed scanner is selected).

You can choose a location in the image as the focus position by clicking this button while simultaneously holding down the **Ctrl** key. If you click the **Autofocus** button without specifying a focus position, the autofocus position chosen will be either the center of the image, or, if no autofocus position has been specified since the start of the current session, the center of the current crop.

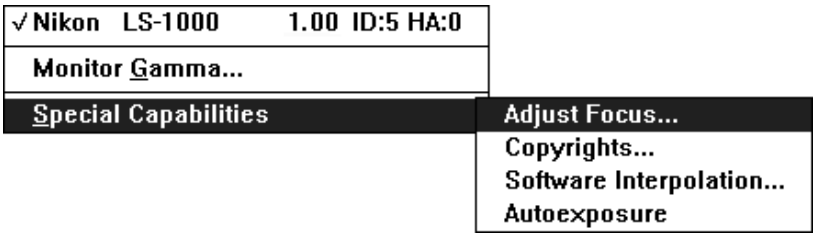


You can cancel the focus position cursor by clicking the **Return to crop** button.

4.10 Adjust Focus (film scanners only)

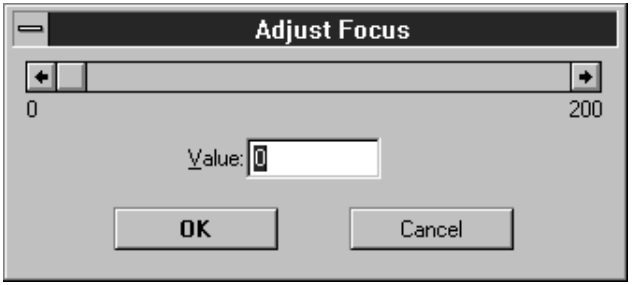
This function allows you to adjust focus to compensate for warping of the film or for differences in the thickness of slide mounts.

To use the Adjust Focus function, choose **Adjust Focus…** from the **Special Capabilities** submenu (the **Special Capabilities** submenu is located on the pulldown menu at the top left corner of the Main dialog box). The Special Capabilities menu for the AX-110 and AX-210 does not include the Adjust Focus function.



Note: *The menu for the LS-4500AF differs from that shown above. See Appendix B.*

When the Adjust Focus function is chosen from the **Special Capabilities** submenu, the following dialog box appears.



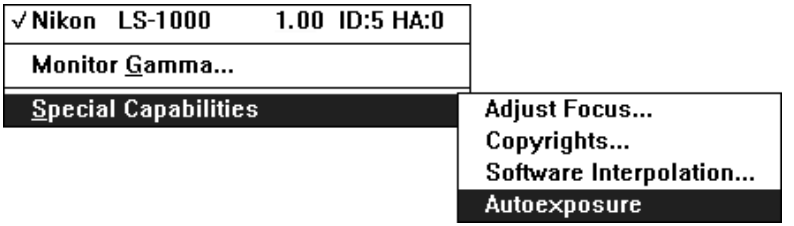
Drag the slider or input the desired value, then click the **OK** button.

Note: *The values shown at the ends of the slider bar will vary depending on the autofocus position and the scanner model. The autofocus position always has a value of zero.*

4.11 Autoexposure

The Autoexposure function can be used to perform a prescan after a preview operation has been completed.

If you click the **Preview** button when the **Prescan** check box is turned off or while holding down the **Ctrl** key, the prescan operation will not be carried out. In this case, you can perform a prescan operation after preview by selecting **Autoexposure** from the **Special Capabilities** submenu.



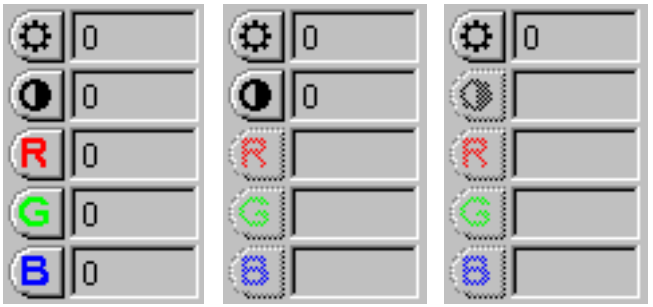
Note: *The pop-up menu shown above is for the LS-1000. The corresponding pop-up menus for the LS-4500AF and for the AX-110 and AX-210 are different. Please see the appendix appropriate to the scanner you are using.*

The prescanning operation begins immediately on your selecting the Autoexposure function from the **Special Capabilities** submenu.

5. Image Compensation

This chapter explains how to adjust continuous tone brightness, line art threshold, contrast, and color balance. All these settings are made using buttons or text edit boxes. The results of compensation can be checked with a preview scan.

The appearance of the Main dialog box varies with the Media Type, as shown below.



Color Grayscale B&W Line Art

Note: *When a monitor with 32K colors or more is used, the R, G, and B buttons are shown in their respective colors.*

5.1 Brightness / Threshold

This control is used to set the brightness for a Color or Grayscale image, or the threshold value for a B&W Line Art image.

When this button is clicked, a slider bar pops up. The value is set by dragging the slider to the left or right while holding down the mouse button. The same result can be achieved by entering a value directly in the box to the right of the button.

When the slider is dragged in the plus direction, the images will be brighter and the black point will begin to float above maximum black. When dragged in the minus direction, the images will become darker and dimmer.

For a B&W Line Art image, the set value is the threshold value.

Brightness adjustment range: -100 to 100

Threshold adjustment range: 0 to 255

5.2 Contrast

This control is used to set the contrast for Color or Grayscale images. A contrast setting is not used for B&W Line Art images.

When this button is clicked, a slider bar pops up. The value is set by dragging the slider to the left or right while holding down the mouse button. The same result can be achieved by entering a value directly in the box to the right of the button.

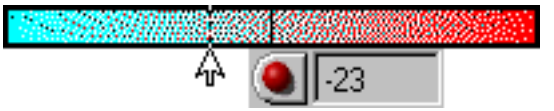
When the slider is dragged in the plus direction, the black point and white point input values will be restricted, thus steepening the tone curve and producing punchier images with less gradation subtlety. When dragged in the minus direction, the black output values will be raised and the white point output values lowered, thus flattening the tone curve and producing flatter images with more gradation subtlety.

Adjustment range: -100 to 100

5.3 Color Balance

The color balance is adjusted using three controls for Red, Green, and Blue. These three controls only appear when 'Color' has been set for the Media Type.

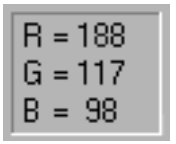
When one of these buttons is clicked and held down, a slider bar pops up. The value is set by dragging the slider to the left or right while holding down the mouse button. The same result can be achieved by entering a value directly in the box to the right of the button.



You can adjust overall color balance by emphasizing or de-emphasizing each of the three primary colors of the scan. Unlike brightness compensation, in which the amount of the Red (R), Green (G), and Blue (B) components in the image are changed simultaneously, affecting the brightness of the image as a whole, color balance adjustment permits individual compensation for each of these colors.

Adjustment range: -100 to 100

5.4 Level Display



RGB values or CMY percentages at the cursor position are displayed while the cursor is over the crop/preview area. The values can be switched between absolute RGB pixel values (in 8-bit level equivalent) and CMY percentages, by clicking within the boundary surrounding the density display area.

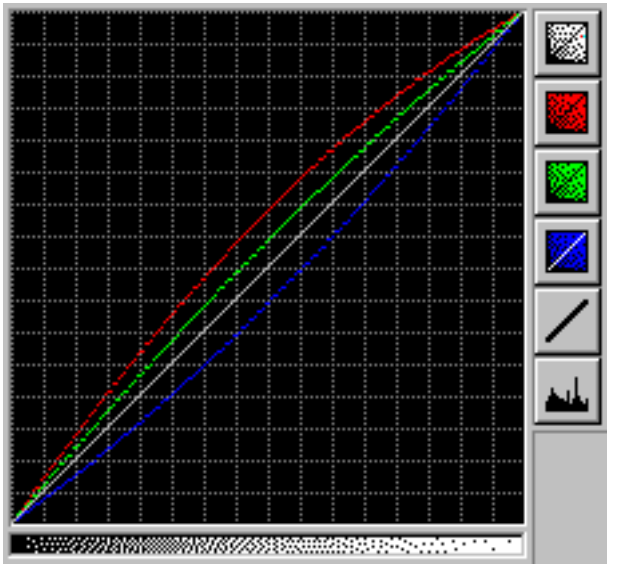
For grayscale images, the L (luminance in 8-bit level equivalence) or K (the black density percentage) value at the cursor position is displayed.

6. Gamma Curves

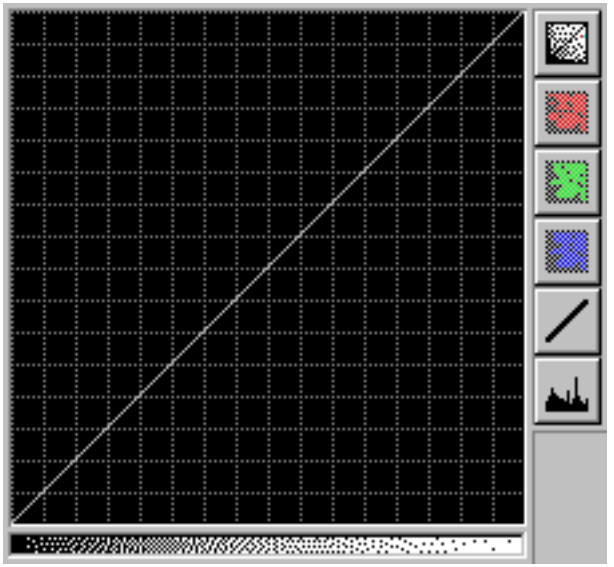
Selective gamma curve editing is essential for the highest-quality scanning. In many cases, the factory default gamma curves will yield excellent results. These default gamma curves are well suited to the widest variety of original media. However, under certain circumstances, you may want to use other gamma curves.

6.1 Viewing the Gamma Curves

When the Media Type is 'Color', four gamma curves are displayed.



When the Media Type is ‘Grayscale’, only one gamma curve is displayed.



When the Media Type is set to ‘Color’, you can edit one master curve and three primary curves, i.e., for Red, Green, and Blue. When the Media Type is set to 'Grayscale', you can edit a grayscale curve only.

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.

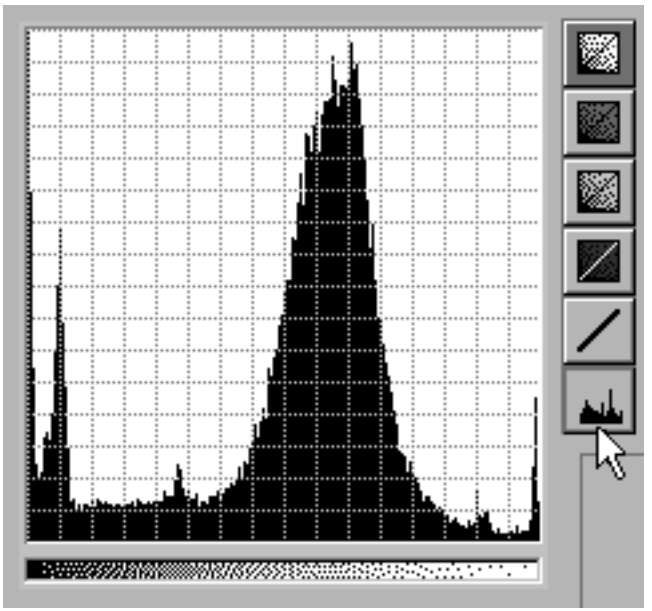
This two-dimensional graph represents the input/output transfer function. The horizontal axis represents the input, or original gamma levels. The vertical axis represents the output, or new gamma levels.

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, an input value of 200 would produce an output value of 200, and so on. A horizontal line running along the bottom border would map all inputs into a zero output, consequently creating a black image. A line beginning at the top left corner, and ending in the bottom right corner, would produce a negative image.

6.2 Viewing the Histogram

At times it may be useful to view the histogram of the preview image. A histogram is a statistical representation of the densities in an image. A histogram will be displayed when the Histogram button is clicked and held. This control is active when either Grayscale or Color is selected as the Media Type in the Main dialog box.

The histogram will be displayed as long as the button is held down.



The histogram's horizontal axis represents the pixel intensity or brightness, the darker values appearing on the left and the lighter values on the right. The vertical axis is a statistical representation of the number of occurrences of each pixel value over the entire image. The histogram therefore represents a graphical and statistical view of the overall brightness of an image.

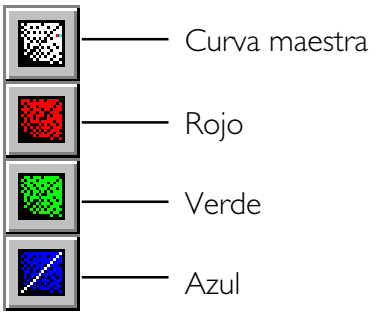
6.3 Modifying the Gamma Curves

Modifying the gamma curves is relatively easy, but modifying them *correctly* is not. While the effects of altering the master curve are straightforward, the relationships between the Red, Green and Blue gamma curves are far more complex, and much more difficult to control.

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

Specifying the Gamma Curve

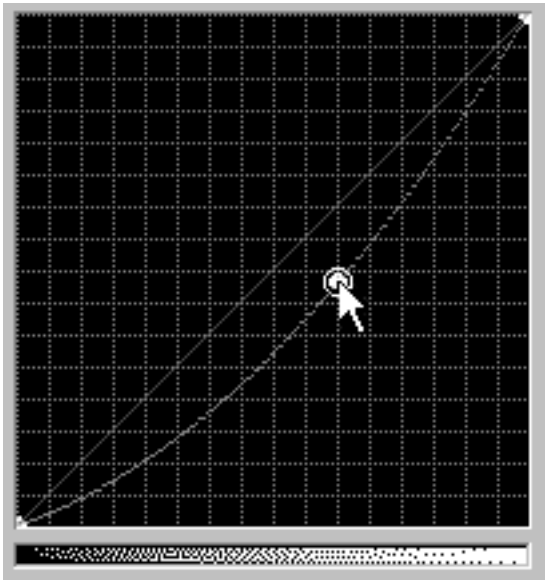
To the right of the graph are four buttons—from top to bottom, the Master Curve button, and the Red, Green, and Blue Curve buttons. The Grayscale Curve button appears only when the Media Type is set to Grayscale.



When one of these buttons is clicked, the gamma curve corresponding to that button is selected for editing. This mode is maintained until another button is clicked.

Graphically Altering the Gamma Curves

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.



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

Forcing the Gamma Curves to Linear

To reset curves to a linear state, clicking the Linear button shown below 'forces' whichever gamma curve is active to linear. Ctrl-clicking the Linear button will force all three gamma curves to linear.

Choosing the **Reset Color Controls** command from the Settings menu will force the master, Red, Green, and Blue gamma curves to linear, and brightness and contrast, R, G, and B adjustment values to zero.

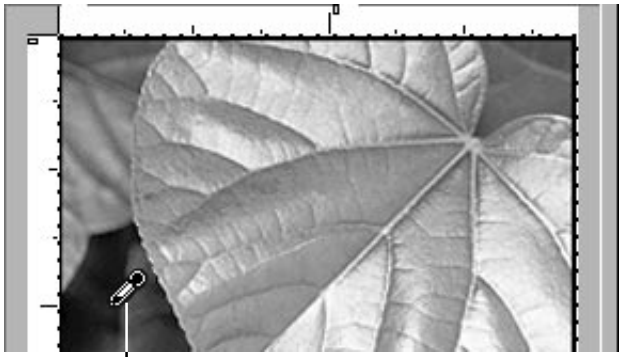
Setting the Black Point

The Black Point represents the darkest point in the image. Since the density range of the original media might exceed the dynamic range of the scanner, the scanner's tonal range needs to be used as efficiently as possible. The Black Point is typically selected so that all values in the image that are darker than this point can be mapped, or converted to black without affecting the quality of the image.

For example, suppose that the darkest area within the image, *that you know to represent a true black*, has a value of 10 in the scanned data. Values 0–9 would be wasted since no pixel in the image would have a value lower than 10. By setting the Black Point to 10, the data would be re-mapped so that a value of 10 from the scanner would produce a 0. All the data values would then be meaningful.

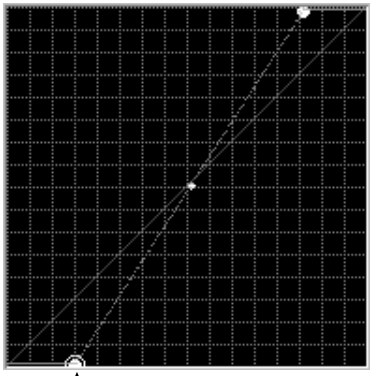
To set the Black Point, click the Black Point button.

After the Black Point button is clicked, 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. Watch the Pixel Value display closely as you move the cursor across the image to enable you to choose the right value to modify. If you are unsure, then zoom in on the area of interest to enhance the detail and increase the accuracy of your selection.



Black Point eyedropper cursor

The pixel you select will become the new Black Point, or reference point for maximum black (often called 'dmax', for 'maximum density'). When the Black Point is selected, the active gamma curve is automatically adjusted to reflect this selection. This tool can be used with any gamma curve, although it is most effective when used with the master gamma curve, as it provides a 'neutral' black point, which is normal for many images.



New Black Point

When you decide on the pixel you want to use as the Black Point of the image, 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. Observe the increase in contrast, and also the reduced White Point, covered in the next section.

The Black Point cursor can be restored to its 'cropping' state, from the 'eyedropper' state, by clicking the **Return to Crop** button.

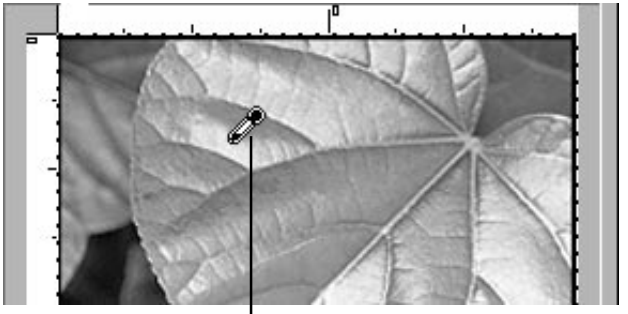
Setting the White Point

The White Point represents the lightest point in the image, thus providing a function opposite to that of the Black Point. Like the Black Point, however, selection of a White Point reduces the tonal range of the scanner so as not to waste any of its tonal range on light areas that are not actually present in the original.

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

To set the White Point, click the White Point button.

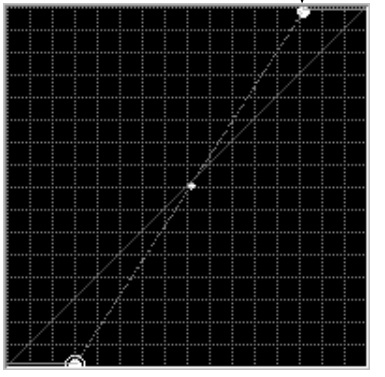
After the White Point button is clicked, position the mouse cursor over the image in the preview window and select a pixel value to be used as the lightest point in the image. Watch the Pixel Value display closely as you move the cursor across the image to enable you to choose the right value to modify. If you are unsure, then zoom in on the area of interest to enhance the detail and increase the accuracy of your selection.



White Point eyedropper cursor

The pixel you select will be mapped to the new White Point, or reference point for maximum lightness, (often called 'dmin', for 'minimum density'). When the White Point is selected, the active gamma curve is automatically adjusted to reflect this selection. This tool can be used with any gamma curve, although it is most effective when used with the master gamma curve, as it provides a 'neutral' white point, which is normal for many images.

New White Point



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

The White Point cursor can be restored to its 'cropping' state, from the 'eyedropper' state, by clicking the **Return to Crop** button.

Automatic Contrast Adjustment

If you prefer, the Nikon Scan TWAIN driver is capable of selecting optimal neutral Black and White Points for you. The Automatic Contrast Adjustment control in the TWAIN driver will usually produce excellent results. Simply click the Contrast Adjust button.

The software will analyze the portion of the preview image contained within the cropped region of the preview, and automatically select an optimum Black Point and White Point. The active gamma curves will be modified automatically.

Note that this may sometimes lead to undesirable color balance. If for example, the original image is of a predominantly 'warm toned' scene, such as a sunset, then the neutral highlight produced by Autocontrast, or the White point eyedropper, would be too 'cold' for the subject matter of the image.

7. Saving and Loading Settings

Using the **Settings** pop-up menu, you can save the settings you have made, or load previously saved settings. This may be convenient for repetitive scanning at particular crops and resolutions, or when using a complex gamma correction to improve reproduction.

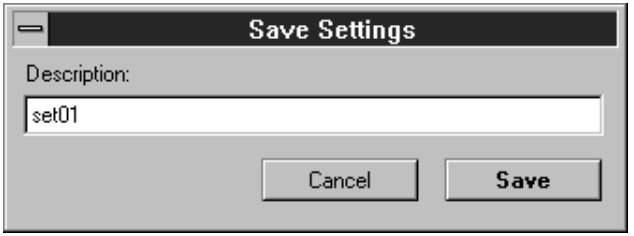
Settings include the following items:

- Scanner selection, media type, width and height units, width value, height value
- Aspect and file size locked/unlocked status, output resolution value, magnification value
- Master, R, G, and B curves, brightness and contrast, R, G, and B adjustment values
- Orientation, horizontal and vertical flip status, help ON/OFF status, crop area size and location

7.1 Saving Settings

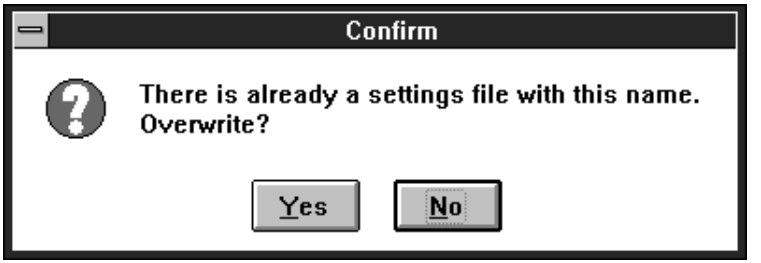
You can save the current Main dialog box settings in the Settings menu of Nikon Scan.

When **Save…** is chosen from the Settings menu, the Save Settings window appears to let you name the new settings.



When you enter a name and click the **Save** button, the settings are saved in the system under that name.

If settings have previously been saved using the entered name, the following dialog box will appear when you click the **Save** button.



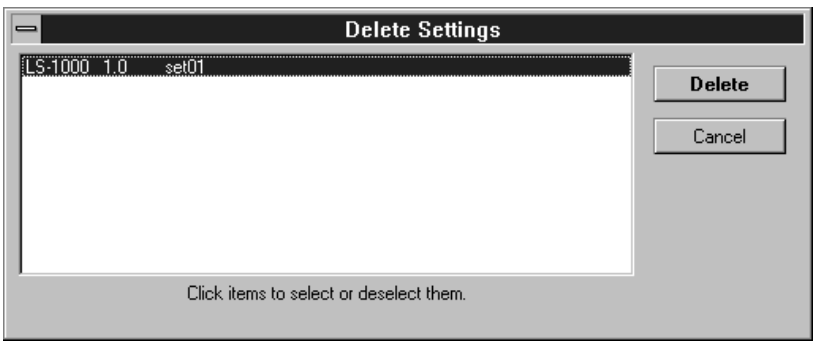
If you want to overwrite the previous settings, click the **Yes** button. If you want to keep the previous settings, click the **No** button and enter a different name for saving the new settings.

If you pull down the Settings menu after performing the save, you will see that the name under which the settings were saved to the system has been added at the end of the menu. If there are a number of settings, the names of all the settings are displayed.

7.2 Deleting Settings

You can delete saved settings using Delete Settings function.

When **Delete…** is chosen from the Settings menu, the Delete Settings window appears to let you specify the name to be deleted.



To delete the settings, choose the names to be deleted and click the **Delete** button. You can delete more than one setting at a time.

When the settings are deleted, the name displayed at the end of the Settings menu is also deleted.

7.3 Recalling Settings

Settings saved in the system include factory default settings and last session settings as well as user settings.

Factory Defaults are set when the product is shipped, and cannot be changed or deleted.

Last Session settings are saved automatically when you quit the program. **Last Session** settings cannot be deleted.

You can recall Factory Defaults, Last Session settings, or settings saved with the Save Settings function. These are displayed at the end of the Settings menu.

When you choose the settings to be recalled, those settings are immediately loaded into the Main dialog box.

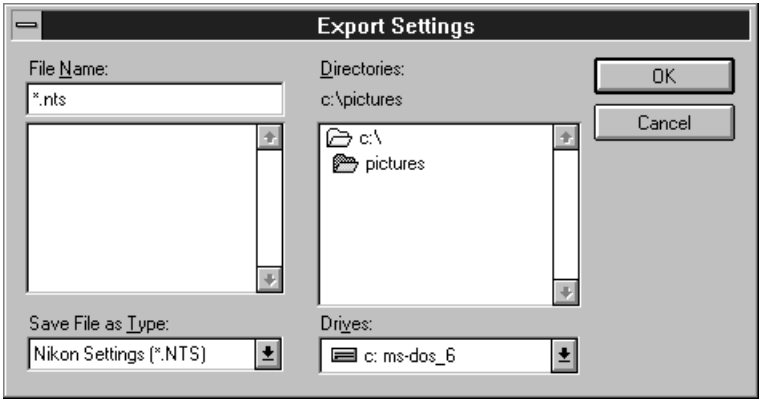
Note: *Last Session will not be displayed on the first use after installation.*

7.4 Exporting Settings

You can save the current Main dialog box settings to a file using the Export Settings function. Unlike the **Save…** function, which saves settings in the system, the Export Settings function saves them to a file that can be located anywhere you can navigate to using the standard file dialog box. A file to which settings have been saved using the Export Settings function can be read using the Import Settings function.

To save the current settings to a file, choose **Export…** from the Settings menu. We recommend that you save your 'mission critical' settings data using **Export…**.

The Export Settings window appears when **Export…** is selected.



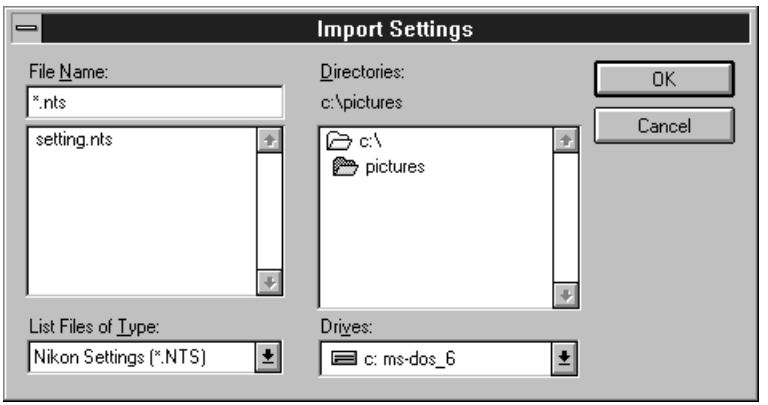
When you click the **OK** button after specifying the drive and directory to be saved to, and entering the file name, the current settings are saved to that file.

7.5 Importing Settings

Using the Import Settings function, you can read the contents of a file saved with the Export Settings function into the Main dialog box.

To read the contents of a file, choose **Import…** from the Settings menu.

The Import Settings window will then appear.



When you click the **OK** button after opening the directory containing the settings and specifying the file, the contents of that file are read.

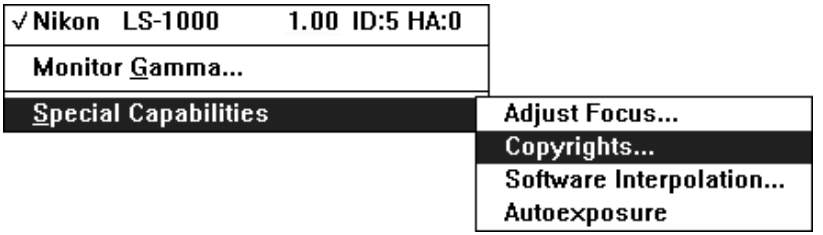
7.6 Reset Color Settings

You can reset the modified gamma curves and image compensation.

Choosing the **Reset Color Controls** command from the Settings menu will force the master, Red, Green, and Blue gamma curves to linear, and brightness and contrast, R, G, and B adjustment values to zero.

8. Copyright Information and the About Window

Copyright Information

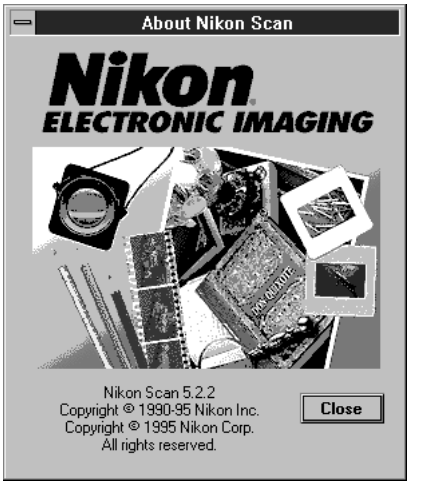


When **Copyrights…** is chosen from the **Special Capabilities** menu, the Copyrights window appears.

The Copyrights window disappears when the **Cancel** button is clicked.

About Window

When **About…** command is chosen from the Control menu, the About window appears.



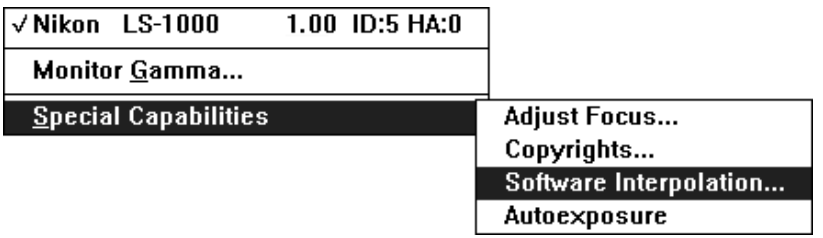
The About window disappears when the **Close** button is clicked.

Appendix A: Features Specific to the LS-20 and LS-1000

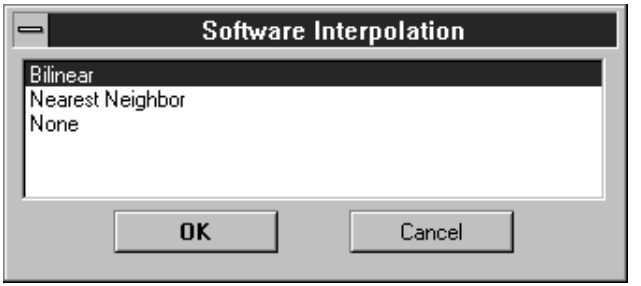
Except that the LS-20 does not support the optional SF-100 Auto Slide Feeder, the operating procedures for the LS-20 and LS-1000 are identical. This following section describes features specific to the LS-20 and LS-1000.

A.1 Software Interpolation

Software Interpolation is used to provide precise image scaling and resolution.



When **Software Interpolation…** is chosen from the **Special Capabilities** menu, the Software Interpolation window appears.



You can choose any one of the following from this window.

Bilinear: Interpolation with emphasis on accuracy

Nearest Neighbor: Interpolation with emphasis on high-speed processing

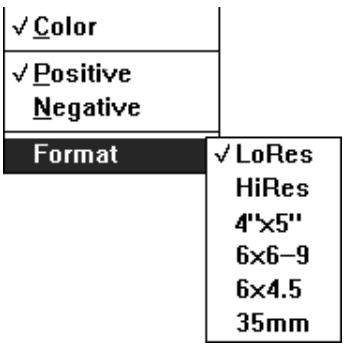
None: No interpolation is performed

Appendix B: Features Specific to the LS-4500AF

The following sections describe features specific to the LS-4500AF.

B.1 Film Format

The film format to be scanned can be chosen from the Media Type menu. Resolution, maximum scanning area, and prescan area are automatically altered to reflect the format selected.



Choose any one of the following from the menu above.

Lores: Uses the low resolution (1000 x 2000 dpi) optical system

Hires: Uses the high resolution (3000 x 3000 dpi) optical system for 35mm film using a single frame holder

4"x5": 4˝ x 5˝ film (low resolution)

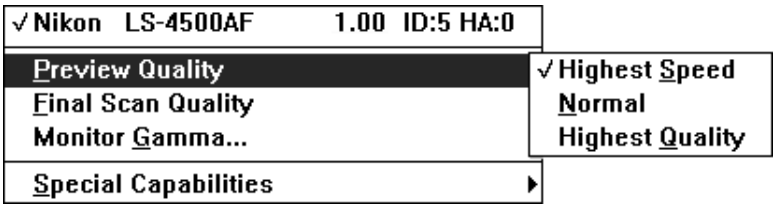
6x6--9: Film measuring from 6 x 6 to 6 x 9 (low resolution)

6x4.5: 6 x 4.5 film (low resolution)

35mm: 35mm film (high resolution)

B.2 Preview Quality

Setting Preview Quality allows you to choose whether preview operations are to be performed in high speed or high quality mode.



Select one of the following from the **Preview Quality** submenu.

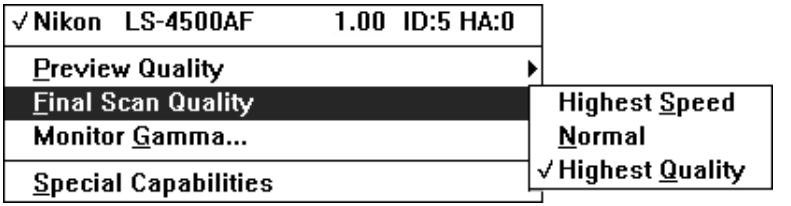
Highest Speed: Preview with emphasis on speed

Normal: Normal preview

Highest Quality: Preview with emphasis on quality

B.3 Final Scan Quality

Setting Final Scan Quality allows you to choose whether scanning is to be performed in high speed or high quality mode.



Select one of the following from the **Final Scan Quality** submenu.

Highest Speed: Scan with emphasis on speed

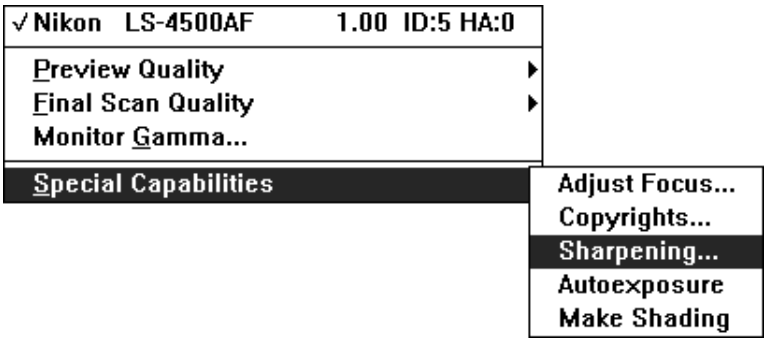
Normal: Normal scan

Highest Quality: Scan with emphasis on quality

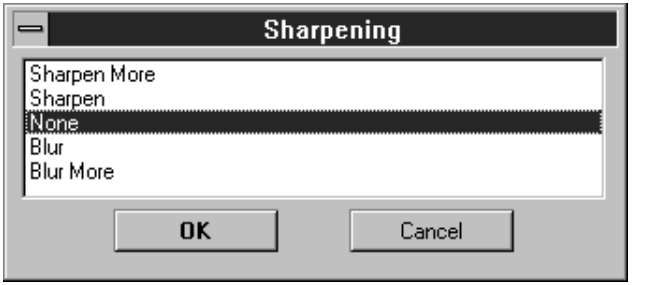
Under normal circumstances the best choice is **Highest Quality**.

B.4 Sharpening

It is often necessary to sharpen images prior to reproduction since there are usually losses in definition when going to press. To enhance edge contrast, choose **Sharpening…** from the **Special Capabilities** menu.



The Sharpening window appears.



Choose one of the following from the Sharpening window.

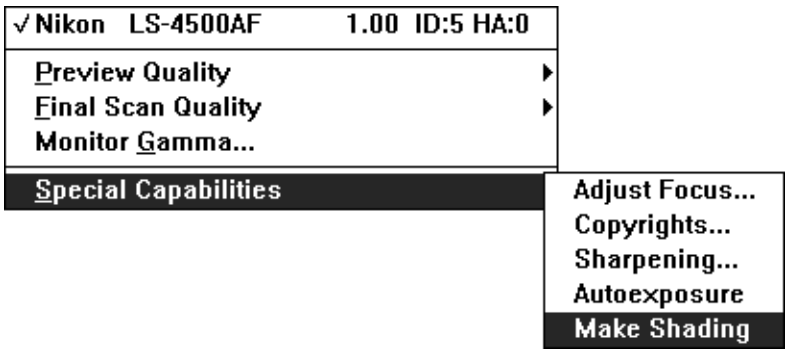
- Sharpen More
- Sharpen
- None
- Blur
- Blur More

B.5 Make Shading

After replacing the lamp, you must perform lamp calibration using the Make Shading function before you can operate the scanner (to replace the lamp, follow the directions given in the LS-4500AF hardware manual).
You must use this function whenever you replace the lamp.

Note: *The film holder must be ejected before this function is used, as otherwise lamp calibration will not proceed correctly.*

The pop-up menu at the top left corner of the Main dialog box includes the **Special Capabilities** submenu. The Make Shading function is executed immediately on your selecting **Make Shading** from the **Special Capabilities** submenu.

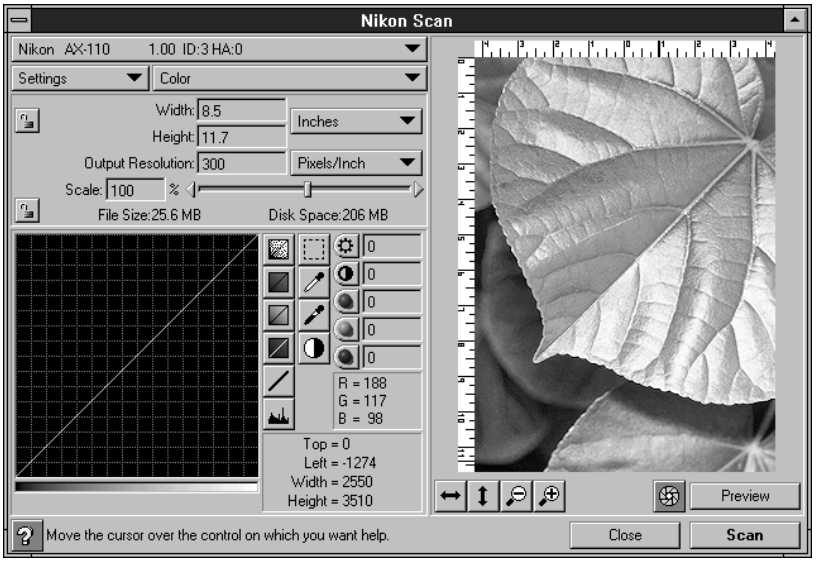


Appendix C: Features Specific to the AX-110 and AX-210

The following sections describe features specific to the AX-110 and AX-210 flatbed scanners. The operating procedures for the two models are identical.

C.1 Main Dialog Box

The Main Dialog Box for the AX-110 and AX-210 is shown below.



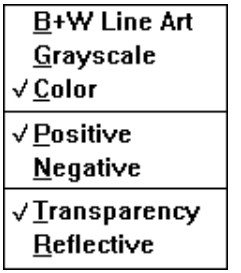
Note that the Main dialog box for flatbed scanners does not include an Eject Film or Autofocus button, and that the rulers in the Preview area differ from those shown for film scanners in scale and point of origin.

C.2 Using Option Adapters

When the optional transparency adapter or ADF (Auto Document Feeder) is fitted to the AX-110 or AX-210, a submenu is added to the Media Type Selection menu to enable the option.

Using the Transparency Adapter

When the optional transparency adapter is fitted to the AX-110 or AX-210, additional items appear at the bottom of the Media Type pop-up menu.



Choose one of the following from the lower part of the Media Type menu.

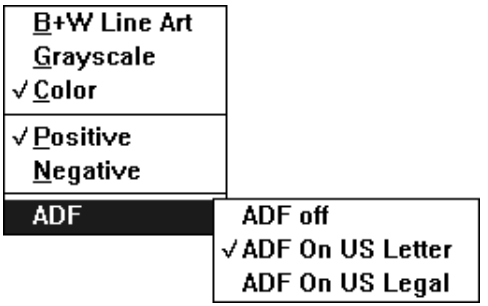
Transparency: To scan transparency images

Reflective: To scan reflective images

Note: *When scanning transparencies with the Media Type set to* **Negative**, *the prescan operation will be optimized for the currently selected crop. If a new crop is selected after preview, it may be necessary to carry out the prescan operation again. After changing the crop area, it is recommended that you click the Zoom-in button to conduct a preview with the prescan optimized for the new crop.*

Using the ADF (Auto Document Feeder)

When the optional ADF (Auto Document Feeder) is fitted to the AX-110 or AX-210, the ADF submenu appears at the bottom of the Media Type menu.



Choose any one of the following from the ADF submenu.

ADF Off: Disables the ADF. The document positioned on the document setting glass will be scanned.

ADF On US Letter:
Enables scanning of letter-sized documents placed on the ADF.

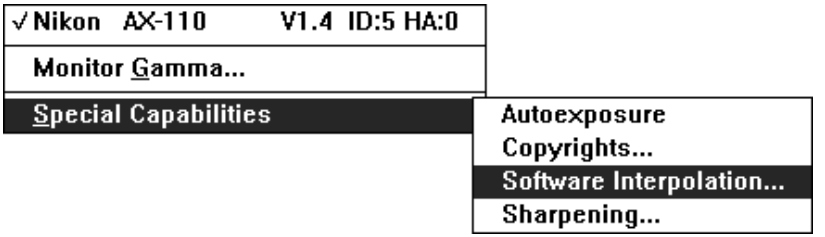
ADF On US Legal:
Enables scanning of legal-sized documents placed on the ADF.

Note: *When the AF-10 Auto Document Feeder is attached to your scanner, automated continuous scanning is available with applications supporting continuous acquire, such as Photoshop versions 3.0 or later or EasyPhoto 1.5. Continuous scanning can be initiated by pressing the* **Crtl** *button + the* **Scan** *button on the main dialog of Nikon Scan.*

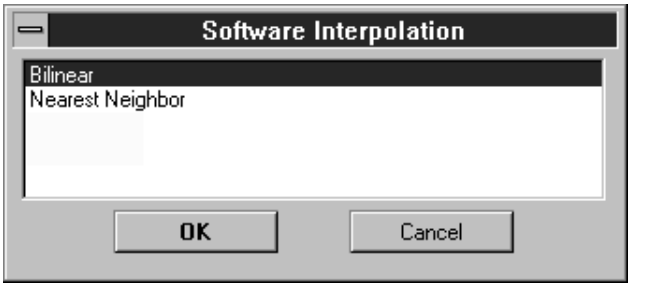
C.3 Software Interpolation

Software interpolation is used to provide precise image scaling and resolution.

The pop-up menu at the top left corner of the Main dialog box includes the **Special Capabilities** submenu. Choose **Software Interpolation…** from the **Special Capabilities** submenu.



The Software Interpolation window appears.



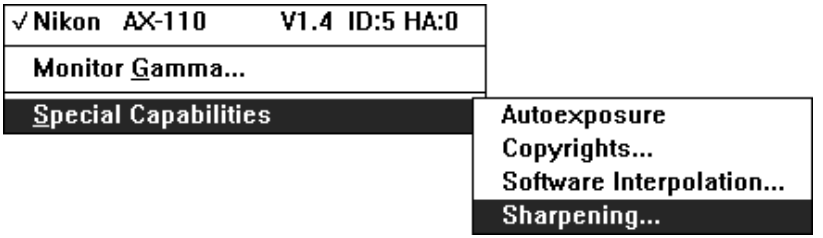
You can choose either of the following from the Software Interpolation window.

Bilinear: Interpolation with emphasis on accuracy

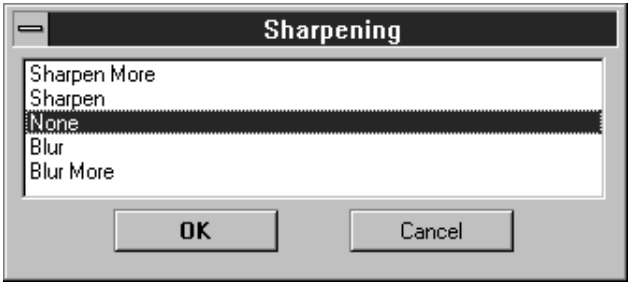
Nearest Neighbor: Interpolation with emphasis on high-speed processing

C.4 Sharpening

It is often necessary to sharpen images prior to reproduction since there are often losses in definition when going to press. To enhance edge contrast, choose **Sharpening…** from the **Special Capabilities** submenu.



The Sharpening window appears.



Choose any one of the following from the Sharpening window.

- Sharpen More
- Sharpen
- None
- Blur
- Blur More

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