Nikon

Nikon Scan 4 Reference Manual

Introduction

Welcome to Nikon Scan! Nikon Scan is used to control Nikon scanners from a computer. It can be used to preview images and adjust scanner settings before scanning, giving the user control over advanced features supported by Nikon film scanners, including:

- The **Scan Image Enhancer** automatically adjusts hue to produce images with clear contrast (9000 ED, 5000 ED, COOLSCAN V ED only)
- **Digital ICE** detects, analyzes, and automatically compensates for scratches and dust
- **Digital ROC** digitally restores faded colors in old film
- **Digital GEM** automatically corrects for film grain, smoothing pictures taken with high-speed film
- **Digital DEE** reveals details in shadows of backlit and underexposed shots and increases contrast in "washed-out" areas of highlights to produce natural-looking exposure (9000 ED, 5000 ED, COOLSCAN V ED only)

Nikon Scan also supports batch scanning and can be used to scan images directly into third-party applications such as Adobe Photoshop.

This manual has been written to guide the user through the process of scanning and enhancing images. For information on how to perform specific tasks, see the "Scanning Guide." For information on specific elements of the Nikon Scan interface, see "The Scan Window," "The Tool Chest," "Preferences," and "Image Windows." For troubleshooting information and a glossary of imaging terminology, see the appendices.

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To make it easier to find the information you need, the following symbols and conventions are used:

✔	This icon marks cautions, information that should be read before use to prevent damage to the scanner.
✐	This icon marks notes, information that should be read before using Nikon Scan.
🔎	This icon marks tips, additional information that may be helpful when using Nikon Scan.
👁	This icon indicates that more information is available elsewhere in this manual or in other documentation.

Use the following buttons and links to navigate the manual:

◀	Click to go back one page.
▶	Click to go forward one page.
TOP	Click to go to the beginning of the section.
🏠	Click to return to the table of contents.
💿 and/or **blue underlined text**	**Blue underlined text** indicates a link to another part of this manual or the World Wide Web. Click the text to follow the link (note that a web browser and an Internet connection are required to link to the World Wide Web).

✐ Illustrations

Save where otherwise noted, the illustrations in this manual show the menus and dialogs displayed when the SUPER COOLSCAN 5000 ED is used under Windows XP. Illustrations from Mac OS X are included where operations for Windows and Macintosh versions differ.

✐ Background Knowledge

This manual assumes familiarity with operations common to the Macintosh and Windows operating systems. Refer to the documentation provided with the operating system if in doubt concerning the meaning of any of the terms used here.

🔎 Printing This Manual

To print this manual for ease of reference, select **Print…** from the Adobe Acrobat Reader **File** menu and specify the desired page range.

🔎 Life-Long Learning

As part of Nikon's "Life-Long Learning" commitment to ongoing product support and education, continually-updated information is available on-line at the following sites:
- For users in the U.S.A.: **http://www.nikonusa.com/**
- For users in Europe: **http://www.nikon-euro.com/**
- For users in Asia, Oceania, the Middle East, and Africa: **http://www.nikon-asia.com/**

Visit these sites to keep up-to-date with the latest product information, tips, answers to frequently-asked questions (FAQs), and general advice on digital imaging and photography. Additional information may be available from the Nikon representative in your area. See the URL below for contact information: **http://www.nikon-image.com/eng/**

System Requirements

Nikon Scan must be installed before the scanner can be used to scan images. See the documentation provided with the scanner for complete installation instructions. Before installing Nikon Scan, make sure that the computer satisfies the following system requirements:

Windows

CPU	300 MHz Pentium or better
OS	Preinstalled versions of Windows XP, Windows 2000 Professional, Windows Me, Windows 98 SE
RAM*	128 MB or more (512 MB or more recommended)
Hard-disk space†	A minimum of 40 MB required for installation (200 MB recommended), with an additional 200 MB of free disk space available while Nikon Scan is running.
Video resolution	800 × 600 pixels or more with 16-bit color (High Color) or more.
Interface	**USB‡** Built-in USB 1.1/USB 2.0 ports **IEEE 1394** OHCI-compliant IEEE 1394 interface required.
Miscellaneous	CD-ROM drive required for installation.

*More memory may be required depending on film type, scan size, resolution, bit depth, the number of scans performed in each session, the film holder or adapter used, and on whether Digital ROC, Digital GEM or Digital DEE is used. A system with more than the minimum amount of memory is recommended.

†More free disk space may be required depending on the film type and number of frames. Nikon recommends having as much free disk space as possible when running Nikon Scan.

‡Depending on the type of interface installed, USB will operate at high speed (USB 2.0 only; maximum transfer rate 480 Mbps) or full speed (USB 1.1/USB 2.0; maximum transfer rate 12 Mbps). Windows XP and Windows 2000 Professional computers with a USB 2.0 interface support high-speed USB. For more information, consult the manufacturer.

Additional information technical and support information may be available at **the Nikon web sites listed in this manual (3)**.

Macintosh

CPU	Power PC G3 or later (G4 or later recommended)			
OS*	Mac OS 9 (9.1 or later), Mac OS X (10.1.5 or later)			
RAM†	• Mac OS 9: 64 MB or more (256 MB or more recommended) • Mac OS X: 128 MB or more (512 MB or more recommended)			
Hard-disk space‡	A minimum of 70 MB required for installation (200 MB recommended), with an additional 200 MB (Mac OS 9) or 550 MB (Mac OS X) of free disk space available while Nikon Scan is running.			
Video resolution	800 × 600 pixels or more with 16-bit color (thousands of colors) or more.			
Interface	**USB****	Built-in USB 1.1 ports, USB 2.0.††	**Firewire**	Only built-in Firewire ports supported.
Miscellaneous	CD-ROM drive required for installation.			

*For the latest information on supported versions of Mac OS, see **the Nikon web sites listed in this manual (3)**.

†More memory may be required depending on film type, scan size, resolution, bit depth, the number of scans performed in each session, the film holder or adapter used, and on whether Digital ROC, Digital GEM or Digital DEE is used. A system with more than the minimum amount of memory is recommended.

‡More free disk space may be required depending on the film type and number of frames. Nikon recommends having as much free disk space as possible when running Nikon Scan.

Depending on the type of interface installed, USB will operate at high speed (USB 2.0 only; maximum transfer rate 480 Mbps) or full speed (USB 1.1/USB 2.0; maximum transfer rate 12 Mbps). Mac OS X computers with a USB 2.0 interface support high-speed USB. For more information, consult the manufacturer. Users of Mac OS X whose computer is not equipped with USB 2.0 can install a RATOC PCIU3U USB 2.0 interface board (for more information, visit Ratoc Systems English-language web-site at **http://www.ratocsystems.com/english/index.html).

††The computer may fail to recover from sleep mode when a 5000 ED, COOLSCAN V, or COOLSCAN IV is connected via USB 2.0. To prevent the computer from entering sleep mode, select **System Preferences…** from the Apple menu, open the "Energy Saver" pane (in Mac OS 9, select **Energy Saver** from the **Control Panels** sub-menu in the Apple menu), and set the **Put system to sleep whenever it is inactive for** slider to **Never**.

Additional technical and support information may be available at **the Nikon web sites listed in this manual (3)**.

Scanning Basics

Required Hardware
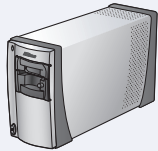
Nikon film scanner

Film
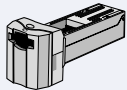
Adapter and/or film holder

After installing Nikon Scan and Nikon View, connect the scanner and ready the film and adapter or film holder. See the scanner *User's Manual* for more information.

Nikon Scan

1 Open the scan window
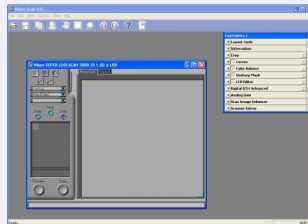
To use Nikon Scan as a "stand-alone" application, select Nikon Scan from the **Start** menu (Windows) or double-click the **Nikon Scan** icon.
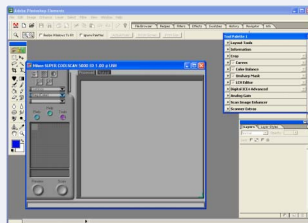
To use Nikon Scan to scan images into third-party applications such as Adobe Photoshop, select Nikon Scan from the application's list of acquire or import sources.

2 Insert film

See the scanner *User's Manual* for details.

3 Preview

Preview

Click the **Preview** button to preview images in the scan window.

4 Adjust settings

Scan window
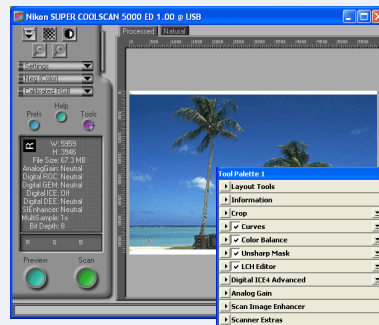
Tool Chest

Use the tools in the scan window and **Tool Chest** to adjust settings and enhance pictures before scanning.

5 Scan

Scan

Click the **Scan** button to scan the images. The images will be opened in windows in the host application.

6 Save
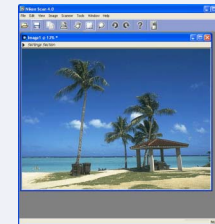
Save the pictures using the **Save** or **Save As…** command in the host application.

Nikon View

Use **Nikon View** to organize saved pictures.

Getting Started

Supported Scanners and Film

Nikon Scan 4 supports the following scanners:

- SUPER COOLSCAN 9000 ED (9000 ED)
- SUPER COOLSCAN 5000 ED (5000 ED)
- COOLSCAN V ED
- SUPER COOLSCAN 8000 ED (8000 ED)
- SUPER COOLSCAN 4000 ED (4000 ED)
- COOLSCAN IV ED

The following types of film can be scanned:

Scanner	Film holder/adapter	Film
9000 ED 8000 ED	FH-835M	35-mm slides
	FH-835S	35-mm film
	FH-869S	Medium-format (120/220, 2¼ or Brownie) film, electron microscope film
	FH-869G	Medium-format (120/220, 2¼ or Brownie) film, electron microscope film
	FH-896GR	Medium-format (120/220, 2¼ or Brownie) film, electron microscope film, 35-mm panorama film
	FH-869M	Medium-format (120/220, 2¼ or Brownie) slides
	FH-816	16-mm film
	FH-8G1	Glass microscope slides
5000 ED 4000 ED COOLSCAN V ED COOLSCAN IV ED	MA-21/MA-20 (S)	35-mm slides (batch scans and thumbnail preview not supported)
	SA-21	35-mm film (in strips of 2–6 frames)
	FH-3	35-mm film (in strips of 1–6 frames; batch scans and thumbnail preview not supported)
	IA-20 (S)	APS (IX-240) film cartridges
	FH-G1	Glass microscope slides (batch scans and thumbnail preview not supported)
5000 ED 4000 ED	SA-30	35-mm film (in strips of 2–40 frames)
	SF-210/SF-200 (S)	35-mm slides (up to 50 slides 1.5 mm thick; thumbnail preview not supported)

Starting Nikon Scan

Before scanning, complete the following steps (see the scanner documentation for details):

• Install Nikon Scan
• Connect the power and interface cables
• Turn the scanner on and insert the adapter, and/or place film in the film holder

Nikon Scan can be used as a "stand-alone" application to scan, process, print, and save images, or it can be used to scan images into a third-party application such as Adobe Photoshop, where the images can then be processed, printed, or saved. The application in which images are displayed after scanning is known as the "host application."

Operation	Nikon Scan used as "stand-alone" application	Third-party host application
Opening the scan window	Open the **Start** menu and select **Nikon Scan 4** from the program list (Windows only) or double-click the Nikon Scan icon in the install destination folder.	Select Nikon Scan from the application's list of "Acquire" or "Import" sources. For more information, see the documentation provided with the application.
Scanning	Images are previewed in the Nikon Scan scan window and modified using the tools in the Tool Chest. Scan settings are adjusted in the scan window and "Preferences" dialog. When preview is complete, click the **Scan** button to scan the images into image windows in the host application.	
Processing	Images are processed in Nikon Scan.	Images are processed in the third-party application.
Saving images	Images are saved from Nikon Scan.	Images are saved from the third-party application.

🔍 Starting Nikon Scan as a "Stand-Alone" Application (Windows)

If a shortcut was created during installation, Nikon Scan can be started by double-clicking the Nikon Scan icon on the desktop.

🔍 Starting Nikon Scan as a "Stand-Alone" Application (Macintosh)

If Nikon Scan was added to the Dock or an alias was created during installation, Nikon Scan can be started by clicking the Nikon Scan icon in the Dock (Mac OS X) or by double-clicking the alias on the desktop (Mac OS 9).

✏️ Calibration (9000 ED, 8000 ED)

When the 9000 ED is turned on, the status LED will blink for one to two minutes while the scanner is calibrated. Do not start Nikon Scan until the status LED has stopped blinking. In the case of the 8000 ED, calibration is not performed until Nikon Scan is started. Do not use the controls in the scan window or Tool Chest until the status LED has stopped blinking.

Starting Nikon Scan as a "Stand-Alone" Application

The scan window opens on the desktop and menus for the Nikon Scan application appear in the Nikon Scan application window (Windows) or menu bar (Macintosh). The Tool Chest will also be displayed the first time Nikon Scan is used.
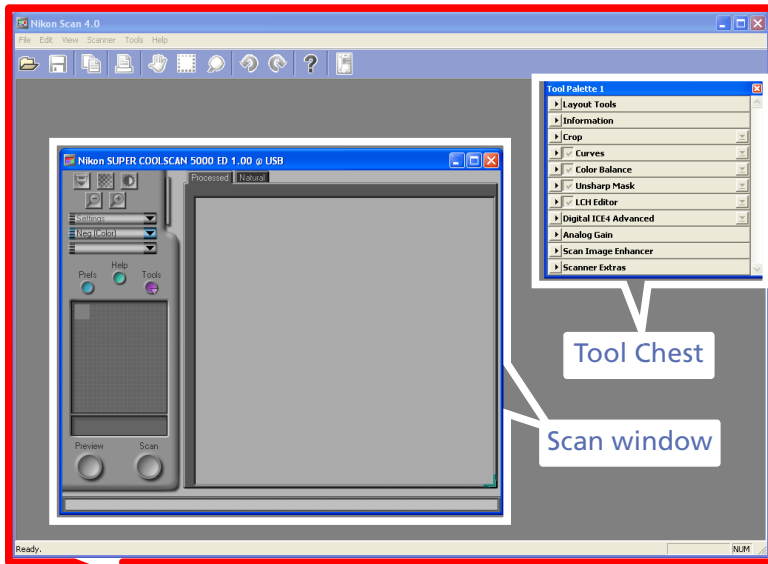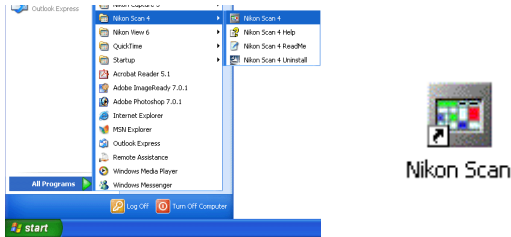
Nikon Scan application window (Windows only)

Starting Nikon Scan from a Third-Party Application

Selecting Nikon Scan from the application's list of acquire or import sources opens the scan window. If this is the first time Nikon Scan is used, the Tool Chest will also be displayed.
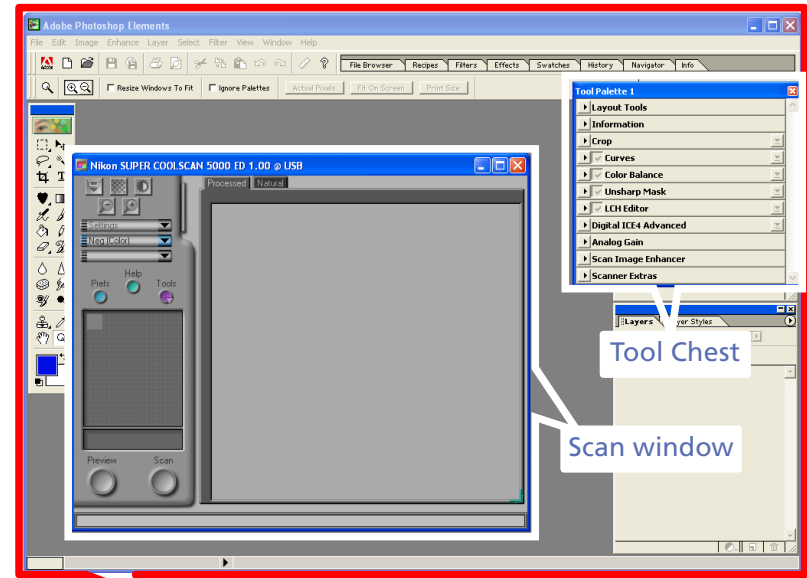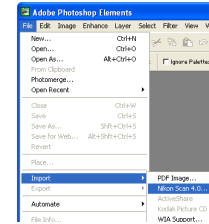
Third-party application (illustration shows Adobe Photoshop)

Opening the Scan Window from Nikon Scan

When Nikon Scan is used as a "stand-alone" application, the scan window can be opened by selecting the scan window from the Nikon Scan **Tools** menu. Use this option if the scan window has been closed after scanning.

Windows

• Select the scan window from the **Tools** menu.

Tools
Show Nikon Browser
Nikon SUPER COOLSCAN 5000 ED 1.00 @ USB
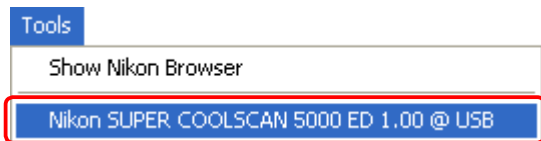
• Select **Open Twain Source** from the **File** menu.
• Click the 📇 icon in the toolbar.

Macintosh

• Select the scan window from the **Tools** menu.

Tools
Show Nikon Browser
Nikon SUPER COOLSCAN 5000 ED 1.00 @ USB

Elements of Nikon Scan
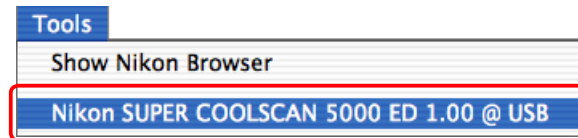
The Nikon Scan interface includes the windows identified below. Click the links for more information.

Progress window (◎ 22)
Shows the status of current tasks and lists operations that have been or are about to be performed.

Image windows (◎ 106)
Images are opened in image windows after scanning, where they can be enhanced, printed, and saved.
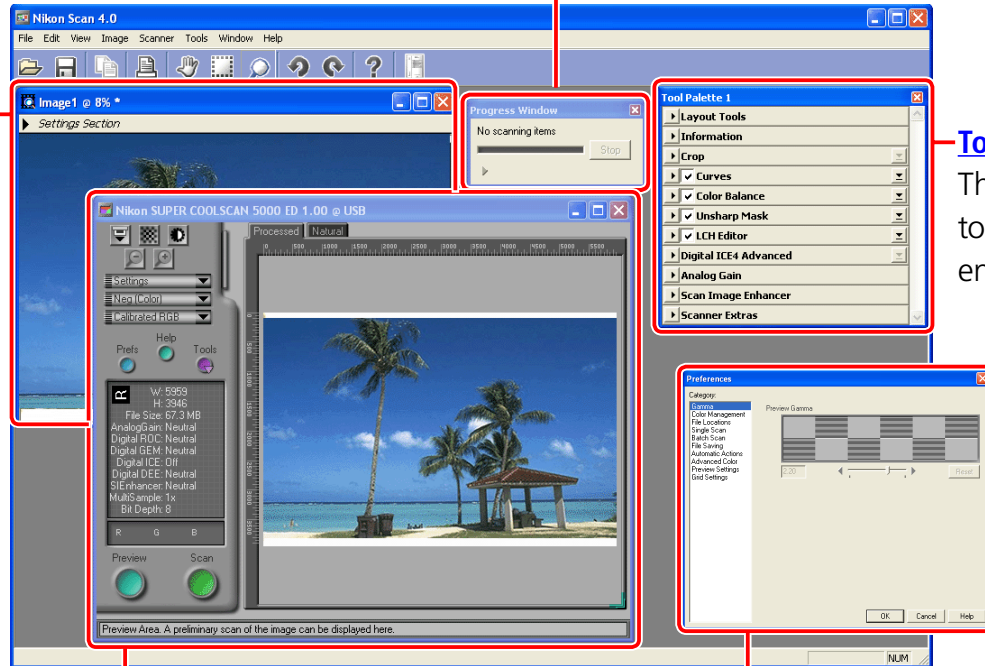
Tool Chest (◎ 30)
The Tool Chest contains tools for scanning and enhancing images.

Scan window (◎ 12)
This is where images are previewed and modified before scanning.

Preferences (◎ 77)
The "Preferences" dialog controls scan window settings.

The Scan Window

The parts of the scan window are identified below. Click the links for more information.

Thumbnail drawer tab (23)
Click to display the thumbnail area, where multiple frames can be selected for preview or scanning.

Title bar
Shows the scanner currently connected.

Control area (13)
Contains frequently used scanning and preview controls.

Preview area (27)
Preview images before scanning.

Information panel (25)
Lists information on current settings.

Interactive help (Windows only)
Displays a brief tip about the control under the cursor.

Preview button (26)
Click to view selected frames in the preview area.

Interactive help text and tool tip for the **Preview** button

Scan button (28)
Click to scan the selected frames.
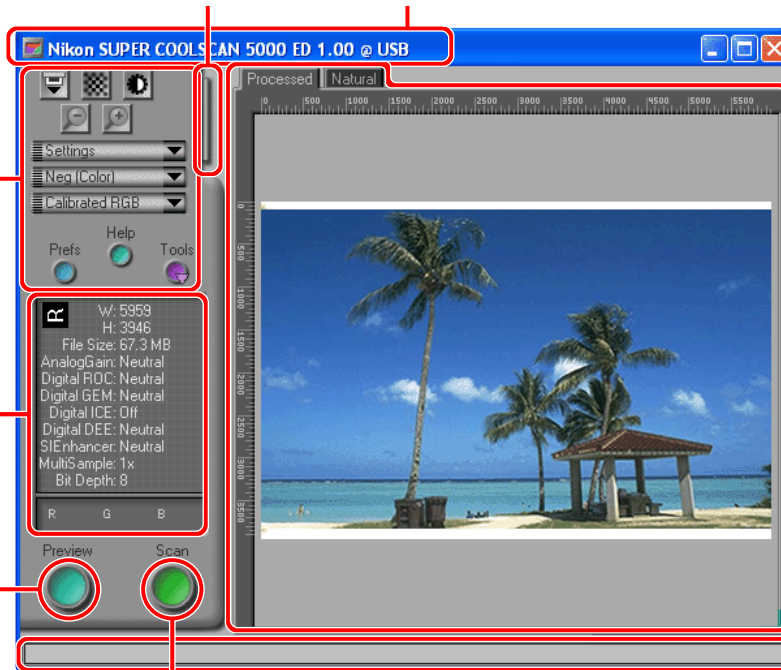
The Control Area

The scan window control area contains frequently-used preview and scan controls. Click the links below for more information about the buttons and menus in the control area.

Name	Control	Description
Eject button (14)		Eject the film or holder.
Autofocus button (15)		Focus the scanner on the point selected with the focus tool.
Autoexposure button (16)		Optimize exposure automatically.
Zoom buttons (16)		Zoom the crop selected in the preview area in or out.
Settings menu (17)	Settings	Save, reset, and load scan window settings.
Film type menu (19)	Neg (Color)	Specify the type of film to be scanned.
Color model menu (20)	Calibrated RGB	Choose to scan images in color or grayscale.
Frame size menu (20) (9000 ED/8000 ED only)	6 x 4.5 (cm)	Specify the film frame size.
Preferences button (21)	Prefs	Open the "Preferences" dialog.
Help button (21)	Help	View help.
Tools button (22)	Tools	Display the Tool Chest or progress window.

The Eject Button

The ⬇ (eject) button ejects film holders or ejects or rewinds film as described below.
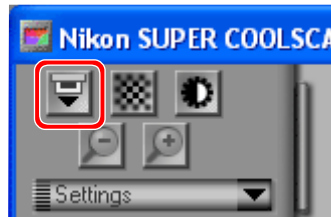
9000 ED/8000 ED

Clicking the ⬇ button ejects film holders from the scanner.

5000 ED/4000 ED/COOLSCAN V ED/COOLSCAN IV ED

The operation performed by the ⬇ button varies depending on the adapter used.

Adapter	Description
MA-21/MA-20 (S)	Eject button not available.
SA-21	Ejects film from adapter.
IA-20 (S) (available separately)	Rewinds film.
SA-30 (available separately for 5000 ED and 4000 ED)	Ejects film from adapter.
SF-210/SF-200 (S) (available separately for 5000 ED and 4000 ED)	Ejects current slide and feeds a new one. To eject current slide without feeding a new slide, press Ctrl (Windows) or option (Macintosh) while clicking eject button.

✎ **MA-21/MA-20 (S)**

When the MA-21/MA-20 (S) is inserted in the scanner, the ⬇ button is grayed out and unavailable. Use the eject button on the adapter.

The Autofocus Button

Clicking the ▓ (autofocus) button focuses the scanner on a selected point (if no focus point has been selected, the scanner will focus on the center of the frame).
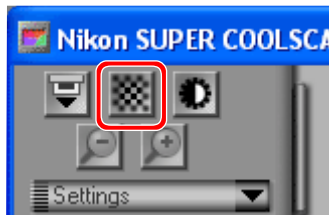
To select a new focus point, click the ▓ button while pressing the Ctrl (Windows) or option (Macintosh) key. The cursor will take the shape of a set of cross hairs (⊕). Move the cursor over the point in the preview image that will be used as the new focus point and click to focus the scanner on the selected point.

✐ Autofocus Preferences

Depending on the options selected in the "Preferences" dialog, an autofocus operation may be performed automatically when the focus point is moved or an image is previewed or scanned:

• If **Perform autofocus when focus point is moved** is selected in the "Automatic Actions" category of the "Preferences" dialog, the scanner will automatically refocus when a new focus point is selected using the Focus Tool.

• If **Auto focus** is selected for "Before scan" in the "Single Scan" category of the "Preferences" dialog, an autofocus operation will automatically be performed when the **Scan** button is clicked to scan a single image.

• If a batch scan is performed when **Auto focus** is selected for "Before each image" in the "Batch Scan" category of the "Preferences" dialog, the scanner will automatically perform an autofocus operation before each scanning each image.

• If **Auto focus** is selected for "Settings to be applied to preview" in the "Preview Settings" category of the "Preferences" dialog, an autofocus operation will automatically be performed when a frame is previewed.

🔎 The Focus Tool

The focus point can be moved using the Focus Tool in the "Layout Tools" palette. Click the ⊕ button in the "Layout Tools" palette to select the Focus Tool, then click in the preview image to select a focus point.

The Autoexposure Button

At default settings, the scanner automatically adjusts exposure as necessary before displaying images in the preview area. The ⬛ (autoexposure) button is only required if autoexposure has been turned off by removing the check from the **Auto exposure for positive film** or **Auto exposure for negative film** options in the "Single Scan," "Batch Scan," or "Preview Settings" categories of the "Preferences" dialog. In these cases, click the ⬛ button before performing the selected operation (single scan, batch scan, or preview) on film of the affected type (positive or negative).
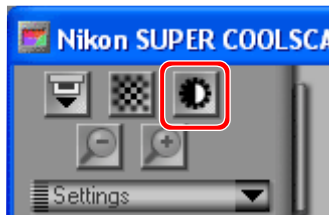
The Zoom Buttons

Click the ⬛ button to zoom in on the current crop, enlarging it to fill the preview area. If a smaller selection is made within the original crop, clicking the ⬛ button will zoom the new selection in to fill the preview area. To zoom out to the previous view, click the ⬛ button.
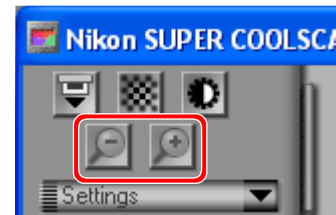
✐ **Preview Image Quality**

The image in the preview area may seem rough and uneven at high zoom ratios. This can be cured by clicking the **Preview** button to preview the image at the new zoom ratio.

The Settings Menu

The settings menu can be used to save and export the following settings and recall them as desired:

- the current scanner, film type, color model, and the location and dimensions of the current crop
- all settings in effect in the Tool Chest, including image orientation, curves, color balance, LCH Editor, Unsharp Mask, and Digital ICE^4 Advanced settings
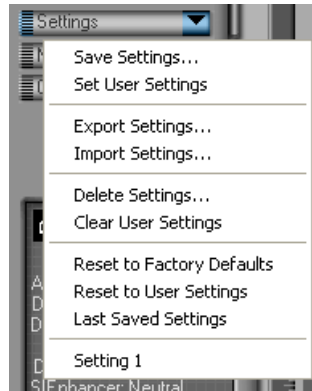
Tool Palette Settings Menus

The settings for the "Crop," "Curves," "Color Balance," "LCH Editor," "Unsharp Mask," and "Digital ICE^4 Advanced" palettes can be saved and recalled separately using the palette settings menu.

"Save Settings…"/"Export Settings…"

To save settings for the current image, use the **Save Settings…** or **Export Settings…** options before previewing another image.

The settings menu contains the following options:

Option	Description
Save Settings…	Saves current settings under a user-specified name. Saved settings will be added to the end of the settings menu.
Set User Settings	Saves current settings as user default settings, which can be recalled by selecting "reset to user settings" options in the scan window or tool palette settings menus. Settings created with the SA-21, IA-20 (S), or SA-30 can be used with any of these adapters, while settings created with the 9000 ED/8000 ED apply to all film holders.
Export Settings…	Exports current settings to a user-specified location. Settings files have the extension ".set".
Import Settings…	Imports settings created with the **Export Settings…** option.
Delete Settings…	Displays dialog where settings created with **Save Settings…** can be selected for deletion.
Clear User Settings	Deletes user defaults created with the **Set User Settings** option.
Restore Factory Defaults	Restores the settings in effect at installation.
Reset User Settings	Restores user default settings created with **Set User Settings**. Settings created with the SA-21, IA-20 (S), or SA-30 can be used with any of these adapters, while settings created with the 9000 ED/8000 ED apply to all film holders.

Option	Description
Last Saved Settings	Restores the most recent settings created with **Save Settings…**, **Set User Settings**, or **Export Settings…**.
Saved settings list	To apply saved settings to selected thumbnails or to the image in the preview window, select the desired settings from the list at the end of the settings menu.

✐ **Settings for Other Adapters or Scanners**
The maximum crop size and other settings differ depending on the adapter and scanner used. When settings for a different scanner or adapter are selected from the settings menu, only those options that apply to the current adapter are affected.

The Film Type Menu

Choose the type of film to be scanned from the options in the film type menu.
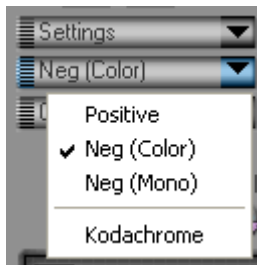
Option	Description
Positive	Use with most makes of positive slides and reversal film. These films have a black film base, and the image in each frame appears in its actual colors.
Neg (Color)	Use with color film negatives. Color negatives can be identified by their orange-tinted film base and by the fact that the colors in the images are reversed.
Neg (Mono)	Use with black-and-white negatives.
Kodachrome	Use with Kodachrome positives. Kodachrome film is manufactured by Eastman Kodak and is usually mounted in cardboard or plastic slide mounts embossed or printed with the label "Kodachrome."

The Color Model Menu

Choose whether to scan images in color or monochrome (grayscale). The options available depend on whether the Nikon Color Management System (CMS) in on (the default setting) or off.

The color-model menu (CMS on)

Option	Description
Grayscale	Choose when scanning images that will be printed or displayed in monochrome.
Calibrated RGB (CMS on)	Choose when scanning images that will be printed in color or edited or displayed on a computer monitor.
RGB (CMS off)	Use to edit raw RGB data from the scanner.

Nikon Color Management

Color management systems using ICC profiles ensure consistent color reproduction among devices such as scanners, monitors, and printers. The Nikon Color Management System is one such ICC profile system, and functions to ensure that colors from the scanner are reproduced accurately on the monitor. See the **"Nikon Color Management System" (📖 78)** for details.

Calibrated RGB/RGB

Calibrated RGB is available when **Use Nikon Color Management** is selected in the "Color Management" category of the "Preferences" dialog, **RGB** when it is not.

The Frame Size Menu (9000 ED/8000 ED Only)

When scanning medium-format (120/220, 2¼ or Brownie) film using the FH-869S or optional FH-869G film holder, select the frame size from the options below (with other holders, the appropriate frame size is selected automatically). The maximum length of the film strip that can be scanned in these holders depends on the frame size.
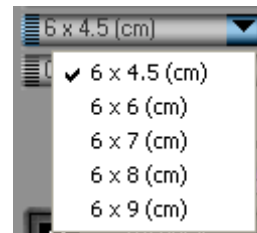
Frame size	Maximum length
6 × 4.5 (cm)	Four frames
6 × 6 (cm)	Three frames
6 × 7 (cm)	Two frames
6 × 8 (cm)	
6 × 9 (cm)	

The Preferences Button

Clicking the **Prefs** (preferences) button displays the **"Preferences" dialog (77)**.
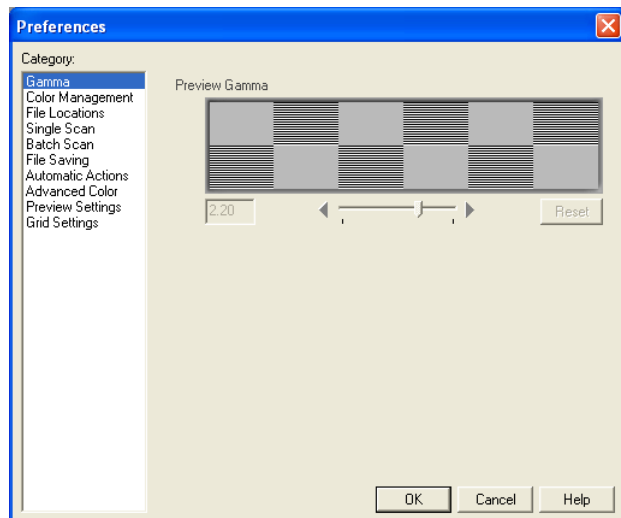
"Preferences" dialog

The Help Button

Clicking the **Help** button displays the Nikon Scan help dialog.
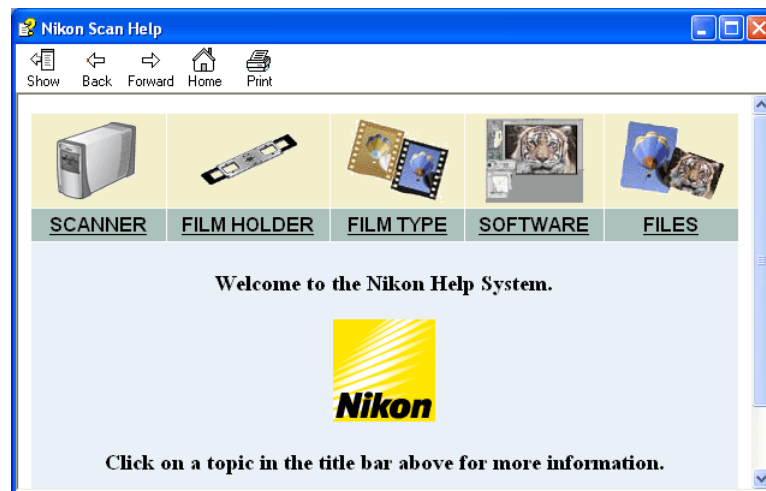
"Nikon Scan Help" dialog

Using Nikon Scan as a Stand-Alone Application

The "Preferences" dialog can also be opened by selecting **Preferences…** from the **Edit** menu (Windows, Mac OS 9) or the Nikon Scan application menu (Mac OS X).

The Tools Button

Clicking the **Tools** button displays a menu that can be used to open the Tool Chest or progress window.
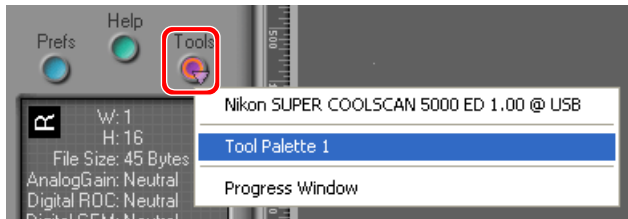
The Tool Chest

Select **Tool Palette 1** to open the **Tool Chest (** ◎ **30)**.
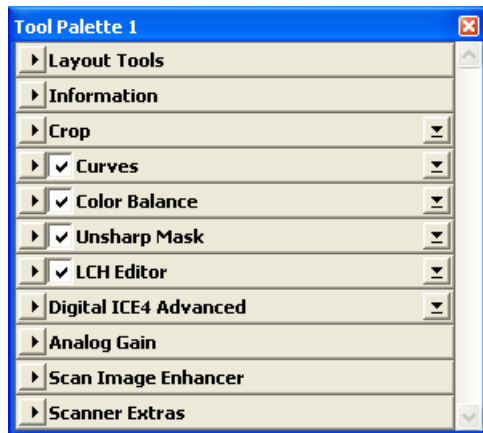
The Progress Window

Selecting **Progress Window** opens the progress window. The progress of the current task (acquiring thumbnails, preview, or scanning) is shown at the top of the window. To cancel the current task, click **Stop**.
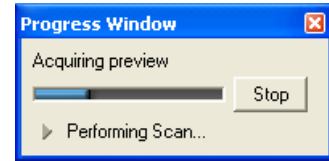
Clicking the triangle under the progress meter displays the "Queue" and "Log" tabs. The "Queue" tab lists the tasks that have yet to be performed. To cancel a task, select it in the list and click the 🗑 button. The "Log" tab lists the tasks that have been completed.
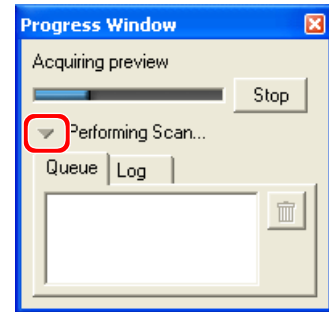
The Thumbnail Drawer Tab

Selecting Frames

If the current adapter or film holder supports thumbnail previews, the frames to be scanned can be selected from the thumbnail drawer. Click the thumbnail drawer tab to open the thumbnail drawer. By default, frames are listed by number; to display the frames as small "thumbnail" previews, click the ⊞ button. Frames can be selected for preview or scanning by clicking the associated frame number or thumbnail. To select multiple frames for a "batch" scan, click each frame while pressing the Ctrl (Windows) or command (Macintosh) key, or press the shift key and click two images to select these images and all frames between them.

Click to display thumbnails

Frame numbers

Thumbnail drawer tab

Thumbnail drawer

Click to hide thumbnails

Click to close thumbnail drawer

Drag to resize thumbnail drawer

Selected thumbnail
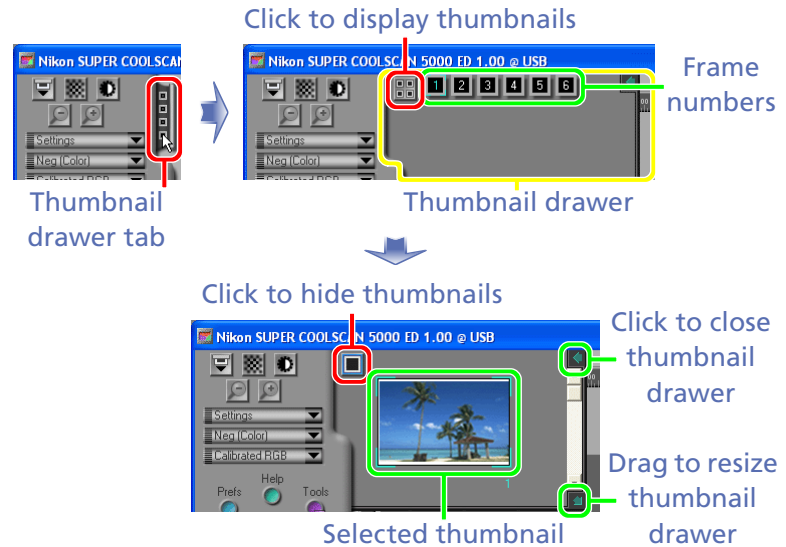
Film Holders and Adapters That Do Not Support Thumbnail Previews

The following film holders and adapters do not support thumbnail previews: MA-21/MA-20 (S) (5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED), SF-210/SF-200 (S) (available separately for the 5000 ED and 4000 ED), and FH-869GR (available separately for the 9000 ED and 8000 ED). The thumbnail drawer tab is not displayed when these adapters and holders are inserted in the scanner.

Batch Scans

Batch scans are supported with the following film holders and adapters:

9000 ED/8000 ED		5000 ED/4000 ED/COOLSCAN V ED/COOLSCAN IV ED	
FH-835M	FH-835S	SA-21	IA-20 (S) (available separately)
FH-869S	FH-869G (available separately)	SA-30 (available separately for 5000 ED and 4000 ED)	
FH-869M (available separately)	FH-816 (available separately)	SF-210/SF-200 (S) (available separately for 5000 ED and 4000 ED)	
FH-8G1 (available separately)			

High-Contrast Images

Thumbnails may have unusual coloration if the associated image is very high contrast. The preview image and final scan are unaffected.

Film Offset

Thumbnails generated with the FH-869S, FH-869G, SA-21, or SA-30 may be slightly out of position. Use the **Strip Film Offset** control in the "Scanner Extras" palette to adjust thumbnail position.

Frame Count

The frame number display for the SA-21 (supplied with the 5000 ED, 4000 ED, COOLSCAN V ED, and COOLSCAN IV ED) always contains six frames regardless of the actual number of frames in the film strip, while the frame number display for the SA-30 (available separately for the 5000 ED and 4000 ED) always contains forty frames. The correct number of frames will be displayed when the ⊞ button is clicked to create thumbnail previews. Both the frame number and thumbnail displays for the 9000 ED and 8000 ED contain as many frames as there are apertures in the holder, even if some apertures are empty.

The Thumbnail Display
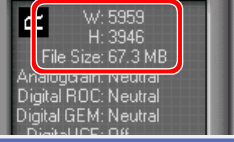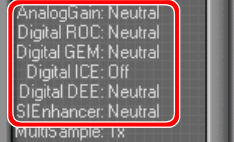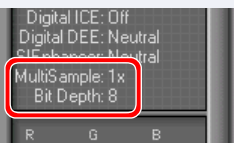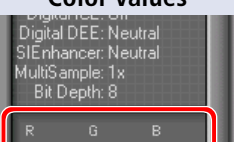
The thumbnail display is stored in memory until new film is inserted in the scanner.

The Information Panel

The information panel provides information about the image in the preview area.

Area	Description	See also
Orientation	Shows the orientation of the preview image, reflecting any flips or rotations that have been performed. If the image has been flipped, the letter "R" will be shown in red.	•**Layout Tools (** 33)
Dimensions/File size	Gives the height and width of the current crop in pixels, and the size of the file that will result if the crop is scanned at the current output size and resolution.	•**Crop (** 36)
Image enhancement	Shows the status of analog gain, Digital ICE⁴ Advanced, and the Scan Image Enhancer. A warning icon will be displayed if the preview image has not been updated to reflect changes to these settings.	•**Analog Gain (** 69) •**Digital ICE⁴ Advanced (** 61) •**Scan Image Enhancer (** 70)
Scanner extras	Indicates the current bit depth (which determines the number of colors in the image) and whether multi-sample scanning (9000 ED, 8000 ED, 5000 ED, and 4000 ED only) is in effect.	•**Scanner Extras (** 71)
Color values	Lists the color values for the point under the cursor. If changes are made to the settings listed at right, the colors in the "Natural" tab will be listed in the top row, the colors in the "Processed" tab in the bottom row.	•**Curves (** 41) •**Color Balance (** 51) •**LCH Editor (** 56)

The Preview Button

Click the **Preview** button to view the image to be scanned in the preview area. If multiple frames are selected in the thumbnail drawer, a preview will be performed for each frame. Click the selected thumbnails in the thumbnail drawer to switch back and forth between previews.
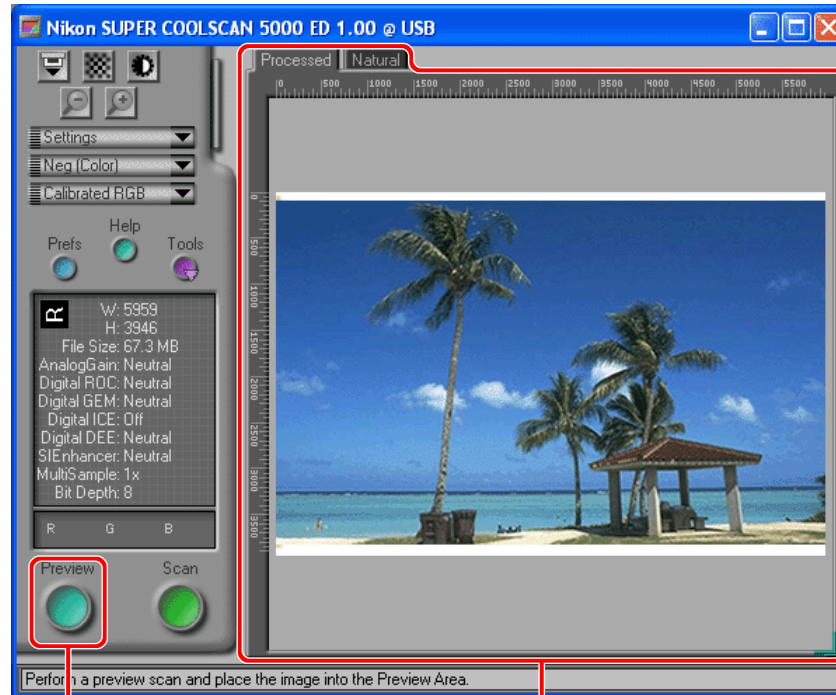
Preview button

Preview area

✎ **Updating Previews**

Be sure to click the **Preview** button to update the image after selecting a new frame size (9000 ED/8000 ED only) or film type, or after making changes to Digital ICE settings in the "Digital ICE4 Advanced" palette or to the **Strip Film Offset** option in the "Scanner Extras" palette.

The Preview Area

The preview image created when the **Preview** button is clicked is displayed in the preview area. The preview area contains two panels: a "Natural" panel showing the unprocessed image and a "Processed" panel that shows the effects of any changes to settings. Click the "Natural" and "Processed" tabs for a quick "before-and-after" comparison that helps determine whether changes to settings are having the desired effect.
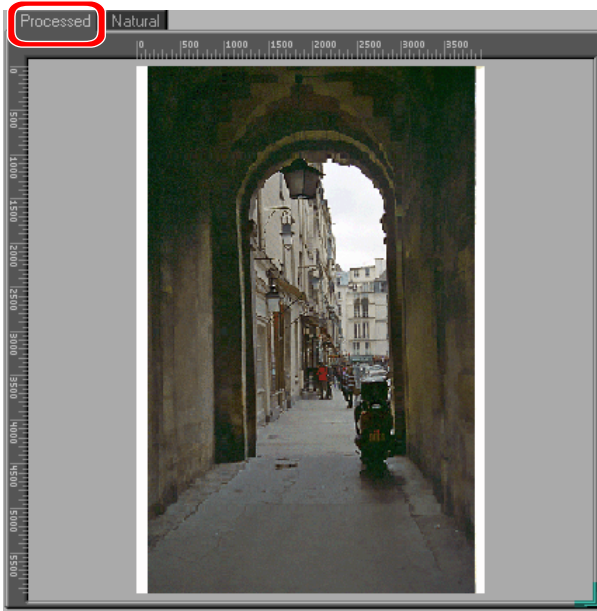
"Processed" (shows changes to settings)
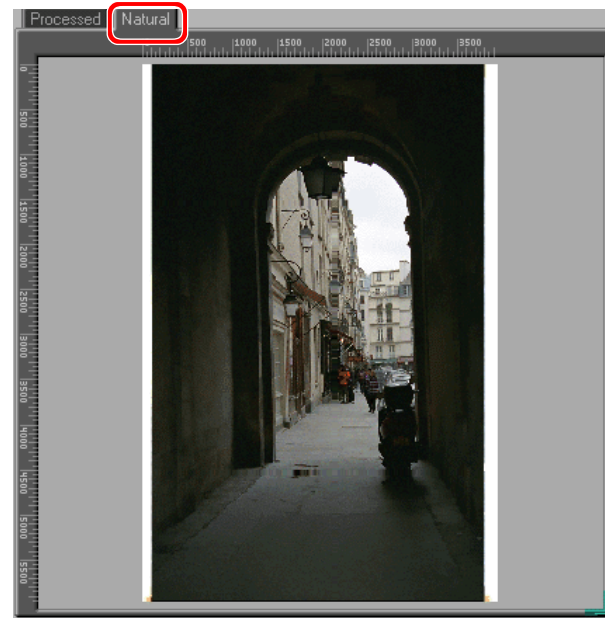
"Natural" (unprocessed image)

Switching Between the "Natural" and "Processed" Panels

When Nikon Scan is used as a stand-alone application, the **Show Natural Pane**/**Show Processed Pane** options in the **Scanner** menu and the Ctrl-T (Windows)/command-T (Macintosh) shortcuts can be used to switch back and forth between the "Natural" and "Processed" tabs.

"Analog Gain"/"Scan Image Enhancer"

Changes to analog gain and the Scan Image Enhancer are reflected in both the "Natural" and "Processed" panes.

The Scan Button

Click the **Scan** button to scan begin scanning (if multiple images are selected in the thumbnail drawer, all the selected images will be scanned). When scanning is complete, the images will be opened in image windows in the host application.

Image window

Scan button
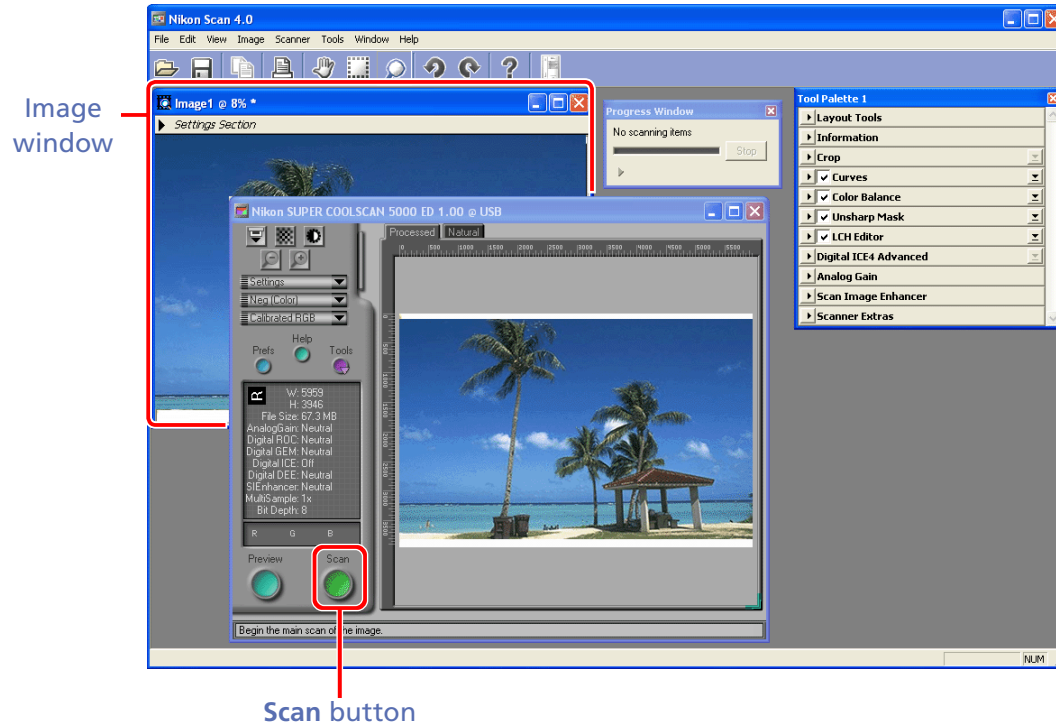
⌨ "Host Application"

The "host application" is the application in which images are displayed after scanning. When Nikon Scan is used as a "stand-alone" application, scanned images will be opened in Nikon Scan. If Nikon Scan is used as a TWAIN source or acquire plug-in for a third-party application such as Adobe Photoshop, images will be opened in image windows in the third-party application.

Batch Scans

"Batch" scans allow a "batch" of multiple frames to be scanned with a single click of the **Scan** button.

Using the Thumbnail Drawer
Batch scans can be performed with **film holders and adapters that support thumbnail previews (⊚ 23)**: all frames selected in the thumbnail drawer are scanned when the **Scan** button is clicked. The images can be scanned at the same settings, or settings can be adjusted separately for each frame.

Multiple Frames, Same Settings
1. Select one frame in the thumbnail drawer.
2. Preview the image and adjust settings as desired.
3. Save changes to settings in the **scan window settings menu (⊚ 17)**.
4. Select all the frames to be scanned in the thumbnail drawer.
5. Select the saved settings from the settings menu (if this step is omitted, the settings in the scan window and Tool Chest will apply only to the first frame; the remaining frames will be scanned at default settings).
6. Click the **Scan** button to scan the selected frames.

Multiple Frames, Different Settings
1. Select the frames to be scanned in the thumbnail drawer.
2. Preview the frames and adjust settings separately for each image (use the thumbnail drawer to switch between frames).
3. Click the **Scan** button to scan the selected frames.

SF-210/SF-200 (S) Slide-Feeder Adapters
The slide feeder adapters available separately for the 5000 ED and 4000 ED also support batch scans, allowing a series of slides to be scanned automatically at the same settings.

1. Preview the first slide and adjust settings as desired.
2. Select the number slides to be scanned in **the "Scanner Extras" palette (⊚ 76)**.
3. Click the **Scan** button to scan the slides at current settings.

🖉 **Batch Scan Settings**
Settings in the scan window and Tool Chest will be reset to default values if the film or holder is ejected before the **Scan** button is clicked.

🖉 **Slide Feeder Adapters**
Because slide feeder adapters do not support thumbnail previews, images can not be selected in the thumbnail drawer, nor can settings be adjusted separately for each slide in a batch scan. To scan a series of slides at different settings, preview and scan each slide separately.

🖉 **"Preferences" > "Batch Scan"**
The **"Batch Scan" category (⊚ 96)** in the "Preferences" dialog contains a variety of batch scan options.

The Tool Chest

The tools in the Tool Chest can be used before scanning to select the area to be scanned, rotate and flip images, specify size and resolution, adjust color, brightness, and contrast, improve sharpness, and mitigate the effects of dust, scratches, and fading. When Nikon Scan is used as a "stand-alone" application, some tools can also be used to edit images opened in image windows after scanning. Click the links below for more information.

Tool Palette 1 ☒	
▶ Layout Tools	**Using the Tool Chest (◉ 31)**
▶ Information	**Layout Tools (◉ 33)**
▶ Crop ⊻	**Information (◉ 35)**
▶ ✓ Curves ⊻	**Crop (◉ 36)**
▶ ✓ Color Balance ⊻	**Curves (◉ 41)**
▶ ✓ Unsharp Mask ⊻	**Color Balance (◉ 51)**
▶ ✓ LCH Editor ⊻	**Unsharp Mask (◉ 53)**
▶ Digital ICE4 Advanced ⊻	**LCH Editor (◉ 56)**
▶ Analog Gain	**Digital ICE⁴ Advanced (◉ 61)**
▶ Scan Image Enhancer	**Analog Gain (◉ 69)**
▶ Scanner Extras	**Scan Image Enhancer (◉ 70)**
	Scanner Extras (◉ 71)

◉ The Scan Window and Image Windows

The "Crop," "Digital ICE⁴ Advanced," "Analog Gain," "Scan Image Enhancer," and "Scanner Extras" palettes are available only in the scan window. When Nikon Scan is used as a "stand-alone" application, the other palettes can be used both before scanning (in the scan window) and after scanning (in image windows).

Using the Tool Chest

Opening the Tool Chest

To display the default Tool Chest, click the Tools button in the scan window control area and select **Tool Palette 1** from the menu that appears.
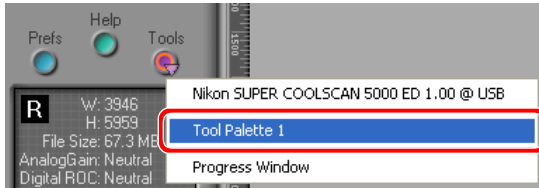
Displaying the Contents of a Tool Palette

To display or hide the contents of a tool palette, click the triangle to the left of the palette title.
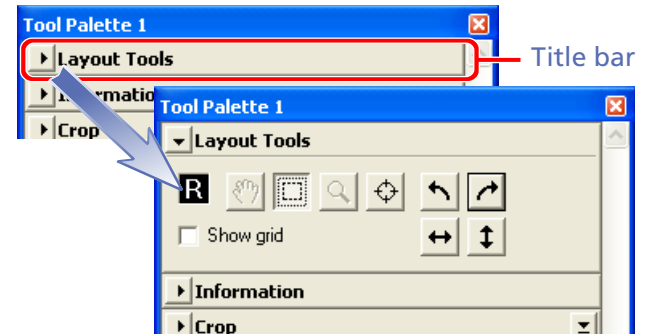
Title bar

Changing the Order of Palettes in the Tool Chest

To change the order of palettes in the Tool Chest, click a tool palette title bar and drag it into a new position.

Moving the "Layout Tools" palette to a position following the "Crop" palette
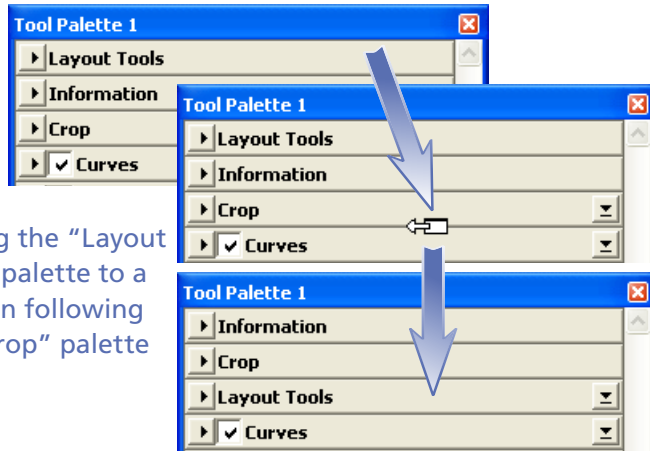
Opening a Tool Palette in a Separate Window

Tool palettes can be opened in a separate window by clicking the palette title and dragging it outside the current window to create a new Tool Chest containing only the selected palette.
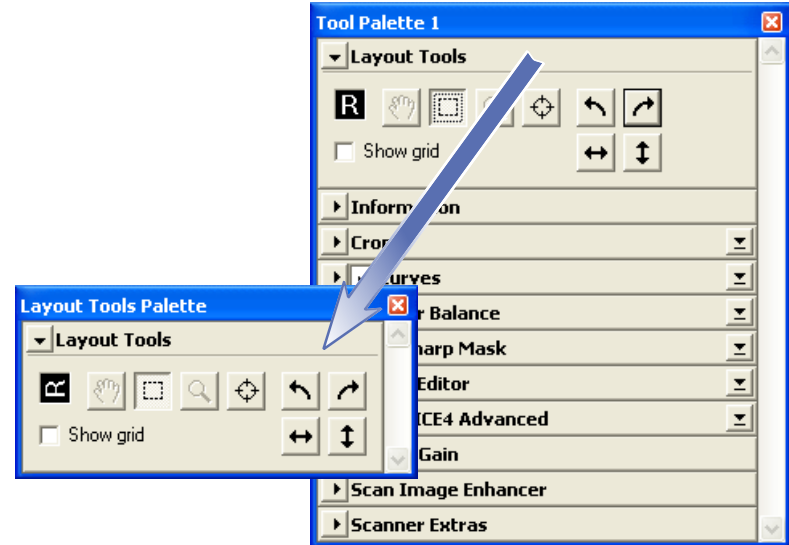
Tools can be added to the new window by dragging additional palettes into the window. The new window will be added to the tools menu in the scan window. If you close the new window by clicking the window close box, you can open it again by selecting the desired Tool Chest from the tools menu.

Layout Tools

The "Layout Tools" palette contains tools for making selections and adjusting focus in the scan window. It can also be used to flip and rotate images both before and after scanning and to navigate images displayed in image windows.

The tools available in the "Layout Tools" palette differ depending on whether the active window is the scan window or an image window.

Tool	Scan window	Image window
Hand Cursor	—	✔
Crop Cursor	✔	✔
Zoom Cursor	—	✔
Focus Tool	✔	—
Rotate	✔	✔
Flip	✔	✔

The Hand Cursor (Image Windows Only)

When Nikon Scan is used as a "stand-alone" application, the Hand Cursor tool can be used to scroll images that have been opened in image windows after scanning. It can not be used in the scan window or a third-party host application.

The Crop Cursor

The Crop Cursor tool is used to make a selection, or "crop." In the scan window, the crop is the area selected for scanning. In image windows, the crop is the source of the histogram.

To make a selection, drag the mouse over the image in the active window. The size of the crop can be changed by dragging its borders, its location by placing the cursor anywhere inside the crop and dragging it to a new position. To cancel the crop, double click anywhere outside the selected area.
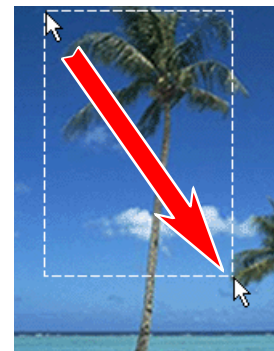
🔍 The Zoom Cursor (Image Windows Only)

When Nikon Scan is used as a "stand-alone" application, the Zoom Cursor tool is used to zoom the images in the active image window in or out. It can not be used in the scan window or a third-party host application.

Select the Zoom Cursor tool and click anywhere within the image window to zoom in on the selected point. To zoom out, click the image while pressing Alt (Windows) or option (Macintosh).
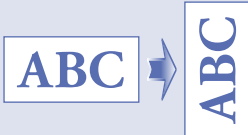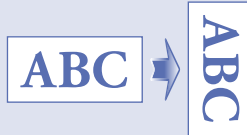
The Zoom Cursor tool can also be activated by selecting **Zoom Cursor** from the Nikon Scan **View** menu.

⊕ The Focus Tool (Scan Window Only)

The Focus Tool is used to select the focus point in the scan window. It is only available when the scan window is active. See **"The Autofocus Button" (�“ 15)** for more information.

↖/↗ Rotate Buttons

Clicking these buttons rotates the image in the active window. Any rotations are reflected in the orientation of the letter "R" in the "Layout Tools" palette.

Button	Description	Button	Description
↖	Rotates image 90° counterclockwise. ABC ➡ ABC	↗	Rotates image 90° clockwise. ABC ➡ ABC

↔/↕ Flip Buttons

Clicking these buttons flips the image in the active window. The letter "R" in the "Layout Tools" palette turns red when the image is flipped.

Button	Description
↔	Flips image horizontally. ABC ➡ ƆBA
↕	Flips image vertically. ABC ➡ ∀BC

Show Grid

When this option is checked, a layout grid is displayed in the active window. The **"Grid Settings" category in the "Preferences" dialog (�“ 105)** controls grid spacing and color.

Information

The "Information" palette provides information about the size and location of the current crop, the position of the cursor within the active image, and the color of the point under the cursor.
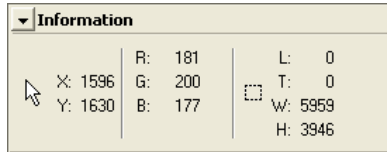
Calibrated RGB/RGB

Grayscale

Item	Description
X: **Y:**	Horizontal (**X**) and vertical (**Y**) distance of cursor from top left corner of image.
L: R: **G:** **B:**	Color values for point under cursor. If selected color model is grayscale, only one channel (**L**uminosity, or brightness) is shown. If selected color is model RGB, separate values are shown for **R**ed, **G**reen, and **B**lue channels. If image has been modified, two values will be shown for each channel, giving color before and after processing. Size of area sampled to determine color value can be changed using **Sample point size** option in **"Advanced Color" category of the "Preferences" dialog (🔘 102)**.
L: **T:**	Coordinates of **T**op **L**eft corner of crop.
W: **H:**	**H**eight and **W**idth of crop.

🔍 The "Information" Palette

The "Information" palette is automatically updated to reflect changes to the crop in the "Crop" palette. All measurements are in pixels.

The "Information" palette can be used in both the scan window and in image windows.

Crop

The "Crop" palette is used to specify the dimensions and resolution at which the current crop will be scanned.

Crop (input) size (size of area scanned)

Output size

File size

Output resolution

Scale

Custom… button
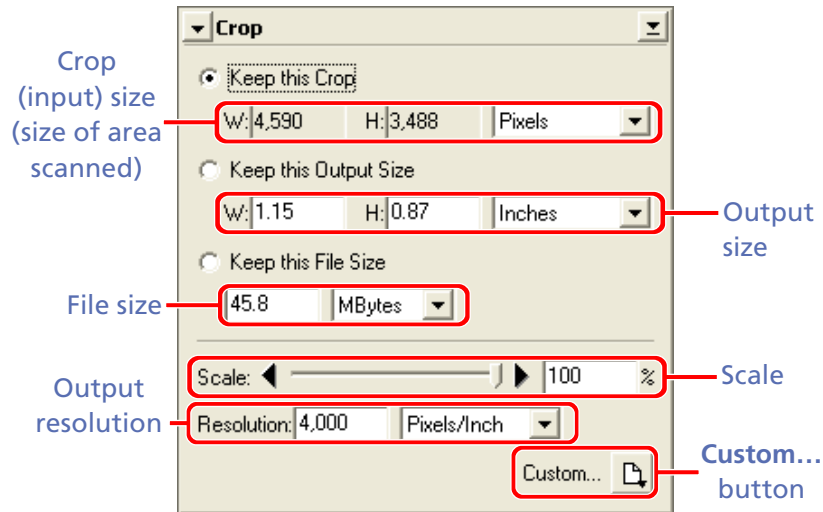
Three options are available for choosing output size and resolution. Select an option according to how the image will be used.

Keep this Crop (◎ 38)

Adjust output dimensions, file size, and resolution without changing the crop selected in the preview area.

Keep this Output Size (◎ 38)

Adjust file size, resolution, and the selection in the preview area without changing the chosen output size.

Keep this File Size (◎ 39)

Adjust output size, resolution, and the selection in the preview area without affecting the chosen file size.

✎ **The "Crop" Palette**

The "Crop" palette is only available when the scan window is active.

The "Crop" palette contains the following items:

Item	Description
Crop (input) size	Gives the dimensions of the current crop. The units for input size can be chosen from the menu to the right of the display; the units chosen are reflected in the rulers in the preview area.
Output size	Gives the output dimensions of the current crop (i.e., the size of the crop after scanning). The units for output size can be chosen from the menu to the right of the display. If a new value is entered for **W**idth or **H**eight when **Keep this crop** is selected, the other value will change automatically to maintain the current crop. If **Keep this file size** is selected when **Pixels** is chosen in the output units menu, the other value will automatically change to maintain the specified file size. This change will be reflected in the dimensions of the current crop.
File size	States the size of the file that will result if the crop is scanned at current settings, before JPEG compression (if applicable) and not including file headers (which typically increase file size by about 10 KB).
Scale	Scale (output size relative to the size of the image on film) can be set by direct entry or using the **Scale** slider.
Output resolution	Enter a value for output resolution (minimum 90 ppi). The units for resolution can be chosen from the menu to the right of the text box.

Item	Description
Custom…	Select from the following menu of custom resolutions: **Add Resolution** .... Add custom resolution **Delete Resolution** .... Delete custom resolution **Inkjet Printer** .... Set resolution to 360 dpi **Dye Sublimation Printer** .... Set resolution to 300 dpi **400 dpi Printer** .... Set resolution to 400 dpi

Choosing an Output Resolution

•Inkjet printers
Most inkjet printers require three or four dots of different colors to reproduce a single pixel (simulated halftone). The target output resolution for an inkjet printer (in pixels per inch, or ppi) is therefore less than the printer's catalogue resolution (in dots in per inch, or dpi). In general, a resolution of 360 ppi will produce acceptable results.

•Dye sublimation printers
Printers that use photographic or dye-sublimation processes reproduce each pixel with a single dot (continuous halftone). The target output resolution for these devices is therefore the same as the printer resolution.

•Commercial printing
Commercial printing processes typically use from 150 to 300 lines per inch (lpi). As a rule of thumb, assume an output resolution (in ppi) of about double the number of lines per inch when scanning for output on a commercial printer.

•Monitors
Computer monitors are usually considered to have resolutions of from 72 ppi (Macintosh) to 96 ppi (Windows).

Follow the instructions below to choose an output size and resolution.

Keep this Crop

When **Keep this Crop** is selected, the size and location of the crop will not change when new values are entered for output size and resolution. This option is the best choice for general-purpose scanning.

1. Select **Keep this Crop**.
2. Drag the mouse in the preview area of the scan window to select a crop. If no crop is selected, the entire image will be scanned.
3. Choose an option from the output units menu and enter the desired value for **W**idth or **H**eight. The remaining dimension will change automatically to maintain the current crop. The output size can also be chosen using the **Scale** slider.
4. Choose an option from the resolution units menu and enter the desired value for resolution, or select a resolution for a specific output device from the **Custom…** button menu.

Keep this Output Size

When **Keep this Output Size** is selected, the values entered for output **W**idth and **H**eight will not change when the crop is resized or a new value is entered for file size. Choose this option when scanning images that must display or print at a specified size.

1. Select **Keep this Output Size**.
2. Choose an option other than pixels from the output units menu and enter the desired value for **W**idth and **H**eight.
3. Choose an option from the resolution units menu and enter the desired value for resolution, or select a resolution for a specific output device from the **Custom…** button menu.
4. Adjust the size and location of the crop. The crop will be maintained at the height-width ratio specified in Step 2, and the value for scale will automatically be adjusted according to the size of the crop.

✎ **"Keep This Output Size"**
Keep this Output size fixes the physical dimensions of the image when output on a printer on monitor. When **Pixels** is selected in the output units menu, adjusting resolution will cause the values shown in the output size text boxes to change. The physical dimensions of the image when output on a printer on monitor will however remain constant.

Keep this File Size

When **Keep this File Size** is selected, the file size will not change when the crop is resized or new values are entered for output size or resolution. Choose this option to specify the exact file size of the final image or to keep file sizes to a minimum for storage or electronic distribution.

1. Select **Keep this File Size**.

2. Choose an option from the file size units menu and enter the desired value for **File size**.

3. Drag the mouse in the preview area of the scan window to select the crop. Output size, scale, and resolution will be adjusted automatically.

The Crop Settings Menu

Clicking the triangle in the top right corner of the "Crop" palette displays the crop settings menu.
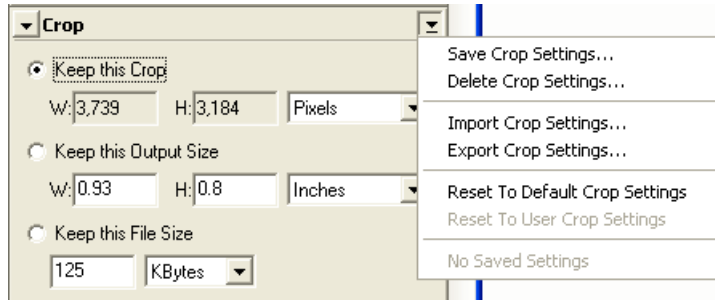
Windows   *Macintosh*
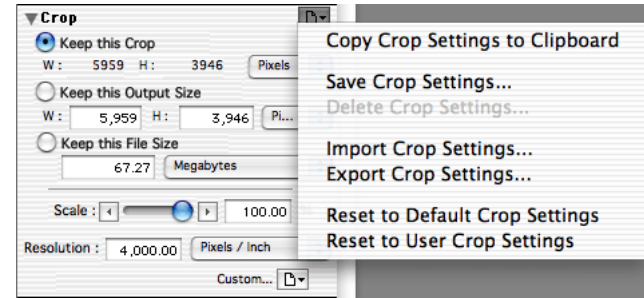
Option	Description
Copy Crop Settings to Clipboard (Macintosh only)	Copy current crop settings to the clipboard. These settings can then be pasted into the "Crop" palette by selecting **Paste** from the **Edit** menu.
Save Crop Settings…	Save current crop settings under a user-specified name. These settings will be added to the end of the crop settings menu, where they can be recalled by selecting the desired settings by name.
Delete Crop Settings…	Delete settings created using the **Save Crop Settings…** option. A dialog will be displayed where the settings to be deleted can be selected by name.
Import Crop Settings…	Import settings created using the **Export Crop Settings…** option.
Export Crop Settings…	Export current settings to a file in a location of your choice. Crop settings files have the extension ".ncc".
Reset to Default Crop Settings	Cancel the current crop and reset resolution and scale to default values.
Reset to User Crop Settings	Restore the default crop settings created with the **Set User Settings** option in the **scan window settings menu (◉ 17)**.

Curves

The "Curves" palette is used to adjust brightness, contrast, and color in specific portions of the tone range (highlights, mid-tones, and shadows). The main editing tool in the "Curves" palette is the curve edit display, which contains a curve showing the relationship between input (the tones in the original image) and output (how the tones in the input will be represented in the final image). Separate curves control the relationship between input and output for the image as a whole (the "master curve") and for each of the component colors, or "channels," in the current color model (red, green, and blue in the case of the RGB color model). The default curve in each case is linear, meaning that tones will be output exactly as they are input.

Input is plotted along the horizontal axis, with shadows (the dark areas of the image) to the left, highlights (the bright areas of the image) to the right, and mid-tones in between. The left end of the axis marks the minimum possible value for colors in the selected channel (zero, or no color), the right end the maximum value. In the case of the master curve, the minimum value represents areas of the input image that are a true black; the maximum value represents areas that are a true white. Output is plotted along the vertical axis, with the minimum possible output value (again, zero, or no color) at the bottom and the maximum output value at the top.

Current channel

Curve edit display

Output

Shadows Mid-tones Highlights

Input

The "Curves" Palette

The "Curves" palette can be used in both the scan window and in image windows.
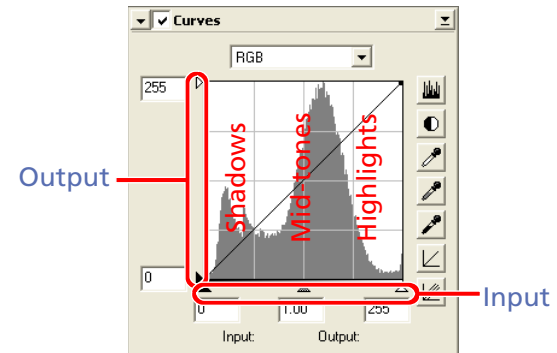
The Curve Edit Display

Although values for input and output in the "Curves" palette range from zero to 255 (eight-bit precision, familiar to users of other image editing software), the results of any changes to curves are calculated at a precision of sixteen bits. This allows images scanned at twelve and fourteen bits to be modified without lowering the quality of the output.

When the cursor is moved over the curve edit display, the input and output values for the point under the cursor are shown in the input/output display.

Apply button

Input/output display
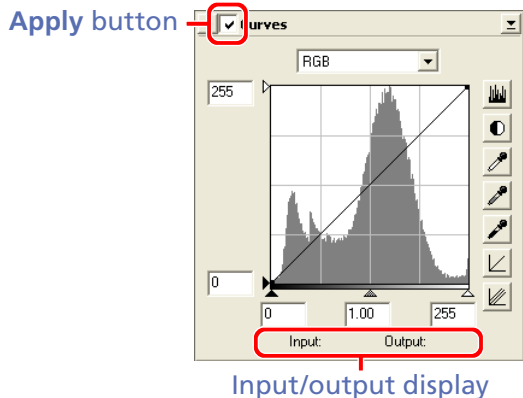
Step 1—Viewing the Histogram

The first step in adjusting tone levels and color balance in the "Curves" palette is to view the histogram displayed in the background of the curve edit display. The histogram provides information on what tones are present in the original image and in what amounts, information that is used when setting the black point and white point and editing curves.
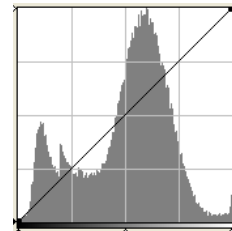
The histogram takes the form of a bar graph. The horizontal axis shows the tone level (pixel brightness), with shadows to the left and highlights to the right. The vertical axis gives the number of pixels of each tone level found in the current crop, scaled to fit in the curve edit display (note that the histogram does not show the position of pixels within the crop).

To view the distribution of tones in the final, output image after changes to curves, click the ▦ button. Click the button again to view the input tone distribution.

The "Apply" Button

Changes to curves only apply when the button at the top left corner of the "Curves" palette is checked. When this button is checked, changes to curves will be reflected in the image in the active window. The box can be checked and unchecked for a quick "before-and-after" comparison to determine whether changes to settings are having the desired effect.

Sixteen-Bit Images

The histogram uses eight-bit precision, with the result that spikes may be visible in the histogram when previewing images at a bit-depth of sixteen bits. Sixteen-bit precision is however used when the image is scanned.

Step 2—Channel Selection

The channel menu is used to select compo-nents of the current color model for editing. Select the master curve to modify tones for all channels in the image. In the RGB color model, the red, green, and blue curves can be modified separately. The histogram shows tone levels for the selected channel only.
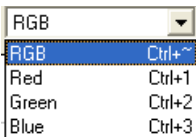
When the master curve is selected, the auto-contrast but-ton and white-point and black-point eyedropper tools apply simultaneously to all of the red, green, and blue curves (the master curve is unaffected). When one of the red, green, and blue curves is selected, these controls can be used to edit only the selected curve.

Channel Selection Shortcuts

The current channel can also be selected using the following shortcuts:
- Ctrl ~ (Windows)/⌘ ~ (Macintosh)
  Master channel (RGB)
- Ctrl 1 (Windows)/⌘ 1 (Macintosh)
  Red channel (RGB)
- Ctrl 2 (Windows)/⌘ 2 (Macintosh)
  Green channel (RGB)
- Ctrl 3 (Windows)/⌘ 3 (Macintosh)
  Blue channel (RGB)

Step 3—Setting White and Black Points

The endpoints of the curve are referred to as the "white point" and the "black point." The black point for a given channel represents the darkest shade (minimum value) for that color, the white point, the brightest shade (maximum value). By default, the input and output values for the black point are zero. The darkest shade in the input image may however be greater than zero, with the result that a portion of the curve is dedicated to reproducing tones not actually present in the image. Increasing the input value for the black point until it matches the darkest shade in the image will steepen the curve, enhancing overall contrast without caus-ing a corresponding loss of detail in shadows. Similarly, if the original image does not actually contain shades correspond-ing to the maximum value, the white point can be lowered to match the brightest shade in the image.

There are two steps to selecting a white point and black point for the final image: choosing the white-point and black-point input levels, and selecting output levels.

White-Point and Black-Point Input Levels

Input levels for the white point and black point can be set using any of the following three methods:

• automatic contrast adjustment
• white-point and black-point sliders
• direct sampling using the white-point and black-point eyedropper tools

Automatic Contrast Adjustment

In automatic contrast adjustment, Nikon Scan automatically selects white and black points that exclude a certain percentage of the brightest and darkest pixels in the image, steepening curves for enhanced contrast (the exact percentage of pixels excluded can be specified in the "Preferences" dialog). By default, 0.5% of the brightest and darkest pixels are excluded, producing a curve that makes optimal use of the output tone range while preserving details in shadows and highlights.

To perform an auto contrast operation, click the ▣ button. The white and black points for each of the red, green, and blue channels will be modified simultaneously and the master curve will be displayed in the "Curves" palette (the master curve itself is unaffected by this operation). Clicking the ▣ button with the Ctrl (Windows) or option (Macintosh) key held down adjusts contrast only for the channel currently selected in the channel menu.

To modify brightness and contrast without affecting color balance, select the master channel and click the ▣ button while pressing Ctrl (Windows) or option (Macintosh).

White-Point and Black-Point Sliders

The white-point and black-point sliders can be used to match the white and black points to the histogram displayed in the curve edit display. While these sliders can be used to edit curves for any channel, the best results are usually obtained when they are used to modify the master curve.
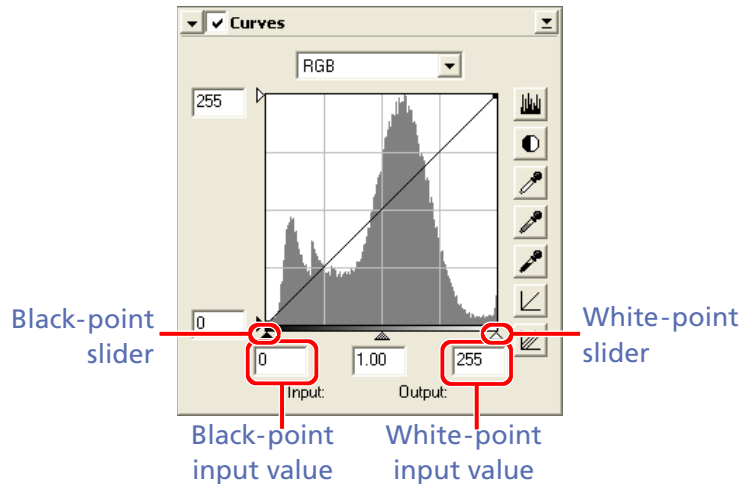
To edit the white point or black point, click the corresponding slider once to activate it, then drag it to the right or left (a value can also be entered directly in the text box underneath the slider). Matching the black-point slider with the lowest input value displayed in the histogram will set the minimum output value for the selected channel to the darkest pixel actually present in the image, steepening the curve and enhancing contrast without sacrificing detail in shadows. Similarly, matching the white-point slider with the highest input value displayed in the histogram will set the maximum output value for the selected channel to the brightest pixel present in the image, enhancing contrast without loss of detail in highlights. Any changes are applied instantly to the active image.

Black-point slider

White-point slider

Black-point input value

White-point input value

Sampling the Image for White Point or Black Point

The white point or black point can be set by directly sampling the image, allowing the user to choose the pixels that will be used to set the maximum (white point) or minimum (black point) output value. This makes it possible to set the black point by matching it to a pixel in the darkest part of the image containing detail you want to preserve, eliminating details in darker areas that are not important to the final image. Similarly, you can match the white point to a pixel in the brightest area of the image containing details important to the final image. While direct sampling can be used with any channel, it is most effective when used with the master curve. When the master curve is selected, sampling will set the white or black point for red, green, and blue curves simultaneously; the master curve itself is unaffected.

To sample the white point, click the ✐ button. When the cursor is moved over the active image, it will take the shape of an eyedropper. Move the cursor over the image to find the pixel that you want to use to set the white point, keeping an eye on pixel level display in the "Information" palette to identify pixels with high input values. With the cursor over the target pixel, click the mouse button. The input value for the selected pixel will be used as the input value for the white point. The image will automatically be altered to reflect the new value for white point and the master curve will be displayed in the "Curves" palette.

To sample the image for the black point, click the ✐ button and move the eyedropper cursor over the image until you find the point that you want to use to set the minimum input value, then click the mouse button to select the black point.

▣ Setting the White or Black Point for the Current Channel

By default, sampling sets the white point or black point for all channels and displays the master curve. To set the white point or black point for the current channel only, press the Ctrl key (Windows) or option key (Macintosh) while clicking the ✐ or ✐ button. To modify brightness and contrast without affecting color balance, select the master channel and press Ctrl (Windows) or option (Macintosh) while clicking the ✐ or ✐ button.

White Point and Black Point Output Levels

Once the input levels for the black and white points have been determined, output levels can be altered to reflect the actual shade of the darkest and brightest pixels in the image. If the darkest shade in the image represents a true black, for example, the output level for the black point can be left at zero. If, however, darkest shade present in the image is a lighter color, the output level for the black point can be raised to achieve more natural coloration.

The output levels for the white point and black point are set using the white-point and black-point output sliders on the left side of the curve edit display.

White-point output slider

Black-point output slider
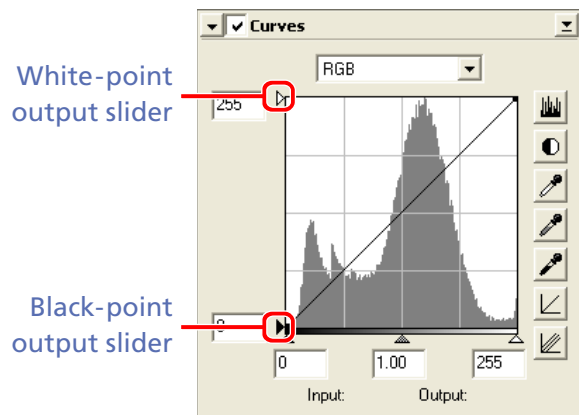
To set the output level, click the slider once to activate it, then drag it up or down until you have found the desired output level (the output level can also be set by entering a value directly in the text box to the left of the slider). The effects of the change will be reflected in the active image.

Output Levels

In some cases, it is best if the darkest and lightest points of the image are not printed or displayed as saturated black or white, even when the colors in the original represent a true black or true white. For example:
• Making blacks less saturated can reduce the amount of ink consumed
• Making whites less saturated can prevent undesirable lines from appearing when a true white is printed in ink (for example, when white is printed on a colored background)

Default Output Values

The default output levels for white point and black point can be set in the **"Advanced Color" category of the "Preferences" dialog (⊙ 101)**.

Step 4—Setting the Gray Point

The point midway between the maximum and minimum input values is known as the "gray point" (or "midpoint"). This point represents a neutral shade corresponding to an output level of 128. The gray point is controlled by a slider at the bottom of the curve edit display. Moving the midpoint slider to the left increases the brightness of mid-tones without "washing out" highlights. Moving the slider to the right darkens mid-tones without obliterating detail in shadows.

The midpoint can be set using the gray-point slider or by directly sampling the image using the gray-point eyedropper tool.

🔧 Gamma

Gamma (also written "γ") is a fundamental property of video systems which determines the intensity of the output signal relative to the input. When calculating gamma, the maximum possible input intensity is assigned a value of one, and the minimum possible intensity (no input) is assigned a value of zero. Output is calculated by raising input to a power that is the inverse of the gamma value (output = input$^{(1/\gamma)}$). In practical terms, raising the gamma value has the same effect as moving the midpoint slider to the left, raising mid-tone output values and brightening the image while leaving the maximum and minimum values untouched. Lowering the gamma value has the same effect as moving the midpoint slider to the right, lowering mid-tone output values and darkening the image. The default value for gamma is one, which produces a linear curve in which input and output values are the same. Gamma can be set to any value between 0.45 and 3.00.

The Gray-Point Slider

The gray-point slider is located at the bottom of the curve edit display.
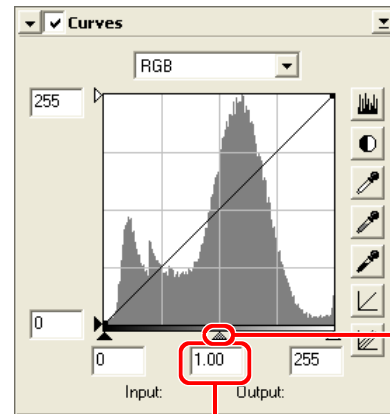
Gray-point slider

Gamma value

Move the slider to the left to increase the brightness of mid-tones in the selected channel, or move it to the right to decrease brightness. Alternatively, you can enter a value for gamma directly in the text box under the slider. The effects of changes to the gray point can be seen in the active image.

Sampling the Image for Gray Point

The gray point can also be set by direct sampling. Regardless of the channel currently selected in the channel menu, sampling simultaneously defines the gray point for each of the red, green, and blue channels while leaving the gray point for the master curve unchanged. Grayscale images can not be sampled for gray point.

To sample the gray point, click the 🖊 button. When the cursor is moved over the active image, it will take the shape of an eyedropper. Move the cursor over the image to find a pixel to use to set the gray point, keeping an eye on the pixel level display in the "Information" palette to identify pixels with a neutral input value (look for pixels that should be a neutral gray color in the final image). With the cursor over the target pixel, click the mouse button. The gray point for each of the component channels will be adjusted to alter color balance without altering the brightness of the sampled pixel (the weight assigned to each channel can be selected using the "Gray point target" options in **the "Advanced Color" category of the "Preferences" dialog; 🔘 101**). The image will automatically be altered to reflect the new value for gray point.

🔍 Resizing the Curve Edit Display

The Tool Chest can be resized by dragging its borders (Windows) or by dragging the handle at its lower right corner (Macintosh). The size of the curves edit display changes with the size of the palette. For increased precision, enlarge the palette when editing curves.

Step 5—Editing Curves Directly

Curves can be reshaped to make adjustments to brightness and contrast in specific portions of the tone range.

Adding New Points to the Curve

Move the cursor to the desired location in the curve edit display and click. A new point will be added at this position and the curve will automatically be adjusted to pass through this point. Points can be repositioned by dragging them to new locations in the curve edit display. Steepening a section of the curve will enhance contrast in that portion of the tone range, while changing the curve to map input to higher or lower output levels will brighten or darken tones in the affected portion of the tone range. The image in the active window will automatically be adjusted to reflect changes to the curve.

Removing Points from the Curve

Points can be removed from the curve by dragging them out of the curve window.

Resetting the Curves to Linear

The default linear curve for the current channel can be restored by clicking the 📈 button in the "Curves" palette. To reset all curves to linear, click the 📈 button.

The Curves Settings Menu

Clicking the triangle in the top right corner of the "Curves" palette displays the curves settings menu.
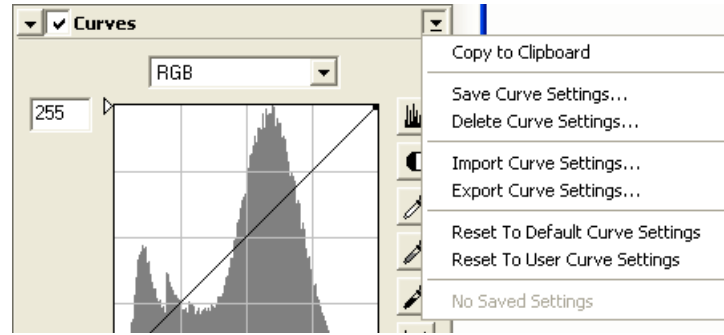
Option	Description
Copy to Clipboard	Copy current curve settings to the clipboard. These settings can then be pasted into the "Curves" palette for another window by activating the window and selecting **Paste** from the **Edit** menu.
Save Curve Settings…	Save current curves settings under a user-specified name. These settings will be added to the end of the curves settings menu, where they can be recalled by selecting the desired settings by name.
Delete Curve Settings…	Delete settings created using the **Save Curve Settings…** option. A dialog will be displayed where the settings to be deleted can be selected by name.
Import Curve Settings…	Import settings created using the **Export Curve Settings…** option.
Export Curve Settings…	Export current settings to a file in a location of your choice. Curves settings files have the extension ".ncv".
Reset to Default Curve Settings	Reset all curves to linear.
Reset to User Curve Settings	Restore the default curves settings created with the **Set User Settings** option in the **scan window settings menu (17)**.

Color Balance

The "Color Balance" palette offers simple controls for adjusting brightness, contrast, and color balance for the entire image. Unlike the controls in the Curves palette, however, the "Color Balance" palette does not allow changes that affect only a portion of the tone range.

The controls in the "Color Balance" palette are described opposite. Note that when "grayscale" is selected for the color model, the "Color Balance" palette contains only brightness and contrast sliders.

Apply button

Sliders
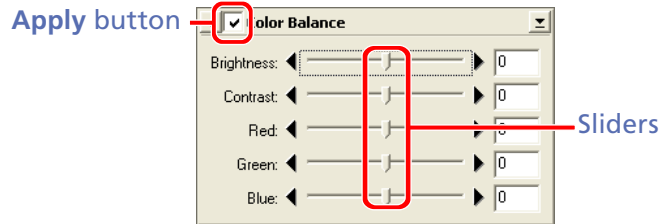
The "Color Balance" Palette
The "Color Balance" palette can be used in both the scan window and in image windows.

The "Apply" Button
Changes to color balance only apply when the button at the top left corner of the "Color Balance" palette is checked. When this button is checked, changes to color balance will be reflected in the image in the active window. The box can be checked and unchecked for a quick "before-and-after" comparison to determine whether changes to settings are having the desired effect.

Item	Description
Brightness	The brightness slider adjusts brightness for the entire image. Dragging the brightness slider in the "+" direction brightens the image, while dragging the slider in the "−" direction darkens the image. A value for brightness between −100 and +100 can be entered directly in the text box to the right of the slider.
Contrast	Dragging the contrast slider in the "+" direction heightens the difference between highlights and shadows in the image, increasing contrast. Dragging the slider in the "−" direction decreases the difference between light and dark portions of the image, lowering contrast. A value for contrast between −100 and +100 can be entered in the text box to the right of the slider.
Color balance (**Red**, **Green**, **Blue**)	While the brightness slider adjusts brightness for the image as a whole, the three color-balance controls allow the user to adjust brightness for each color individually. For example, dragging the red slider in the "+" direction brightens the red portions of the image, making the image as a whole more red. Dragging it in the "−" direction dims the red elements in the image, bringing out the remaining colors. Color balance can also be set by entering values between −100 and +100 directly in the text boxes to the right of the sliders.

The Color Balance Settings Menu

Clicking the triangle in the top right corner of the "Color Balance" palette displays the color balance settings menu.
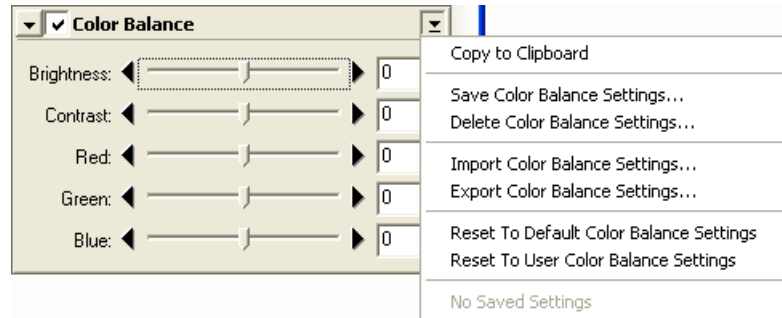
Option	Description
Copy to Clipboard	Copy current color balance settings to the clipboard. These settings can then be pasted into the "Color Balance" palette for another window by activating the window and selecting **Paste** from the **Edit** menu.
Save Color Balance Settings…	Save current color balance settings under a user-specified name. These settings will be added to the end of the color balance settings menu, where they can be recalled by selecting the desired settings by name.
Delete Color Balance Settings…	Delete settings created using the **Save Color Balance Settings…** option. A dialog will be displayed where the settings to be deleted can be selected by name.
Import Color Balance Settings…	Import settings created using the **Export Color Balance Settings…** option.
Export Color Balance Settings…	Export current settings to a file in a location of your choice. Color balance settings files have the extension ".nca".
Reset to Default Color Balance Settings	Reset all sliders to ±0.
Reset to User Color Balance Settings	Restore the default color balance settings created with the **Set User Settings** option in the **scan window settings menu (17)**.

Unsharp Mask

Using Unsharp Mask, the user can increase the sharpness of images by making edges more distinct. Unsharp Mask works by increasing the contrast of edges in the image while leaving other areas untouched. The amount of sharpness is determined by three factors: intensity, halo width, and threshold.

Apply button

Intensity
Halo width
Threshold

Unsharp Mask can be applied to all the colors in the image or selectively to areas of the image in which red, green, blue, cyan, magenta, or yellow predominate, as determined by the color values for each pixel. The brightness (luminosity) of the affected pixels is adjusted to sharpen edges without affecting color balance. The controls in the Unsharp Mask palette can be used to create multiple masks, one for each color or for all colors.

The "Unsharp Mask" Palette

The "Unsharp Mask" palette can be used in both the scan window and in image windows.

The "Apply" Button

Changes to Unsharp Mask only apply when the button at the top left corner of the "Unsharp Mask" palette is checked. When this button is checked, changes to settings will be reflected in the image in the active window. The box can be checked and unchecked for a quick "before-and-after" comparison to determine whether changes to settings are having the desired effect.

Unsharp Mask

Unsharp Mask sharpens edges without affecting color balance by adjusting only luminosity (brightness). The effect is the same as performing Unsharp Mask with the Luminosity channel selected in the Adobe Photoshop Lab color model.

Image Size and Resolution

The amount of Unsharp Mask required depends on the size and resolution of the final image. The more pixels in the image, the greater the amount of Unsharp Mask required to achieve the same degree of apparent sharpness. Before applying a mask, scale the image to the desired size and resolution.

Nikon Color Management (78)

Unsharp Mask is only available when the Nikon Color Management System (CMS) is on. If Nikon CMS is off, the tools in the "Unsharp Mask" palette will be disabled.

Creating Unsharp Masks

Step 1—Select a Color

Select a color from the color menu. Masks apply only to edges where the selected color predominates. To create a mask that applies to all colors, select **All**.

Step 2—Set Intensity, Halo Width, and Threshold

Use the sliders or enter values directly in the text boxes to their right.

Intensity	The amount the contrast of edges will be increased.
Halo Width	The size of the area that will be affected. The greater the halo width, the wider edges will appear. Too large a value for halo width will produce a "halo" along edges in the image.
Threshold	The limit at which sharpening will be applied. If the threshold is zero, sharpening will apply to all pixels in the image. Increasing the threshold increases the amount of contrast that must be present between pixels before the mask will be applied, with the result that only more distinctly contrasting edges will be affected.

Step 3—Check the Results

To compare the effects of the Unsharp Mask with the unmodified image, click the "Apply" button at the top left corner of the "Unsharp Mask" palette to turn the effects of Unsharp Mask on or off.

Step 4—Create Additional Masks

Repeat steps 1–3 to create additional masks for different colors. New masks will be added to the end of the Unsharp Mask list. Masks apply in the order listed. To change the order, select a mask in the Unsharp Mask list and click ⬆ to move it up in the list or ⬇ to move it down. To delete a mask, select it and click the 🗑 button.

The Unsharp Mask Settings Menu

Clicking the triangle in the top right corner of the "Unsharp Mask" palette displays the Unsharp Mask settings menu.
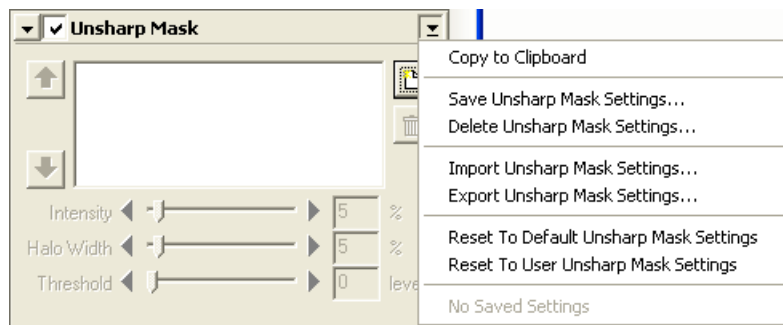
Option	Description
Copy to Clipboard	Copy current Unsharp Mask settings to the clipboard. These settings can then be pasted into the "Unsharp Mask" palette for another window by activating the window and selecting **Paste** from the **Edit** menu.
Save Unsharp Mask Settings…	Save current Unsharp Mask settings under a user-specified name. These settings will be added to the end of the Unsharp Mask settings menu, where they can be recalled by selecting the desired settings by name.
Delete Unsharp Mask Settings…	Delete settings created using the **Save Unsharp Mask Settings…** option. A dialog will be displayed where the settings to be deleted can be selected by name.
Import Unsharp Mask Settings…	Import settings created using the **Export Unsharp Mask Settings…** option.
Export Unsharp Mask Settings…	Export current settings to a file in a location of your choice. Unsharp Mask settings files have the extension ".num".
Reset to Default Unsharp Mask Settings	Delete all masks in the Unsharp Mask list.
Reset to User Unsharp Mask Settings	Restore the default Unsharp Mask settings created with the **Set User Settings** option in the **scan window settings menu (🔘 17)**.

The LCH Editor

The LCH Editor models color using three components: **L**ightness (brightness), **C**hroma (color saturation, or vividness), and **H**ue. Each component has its own edit display. Luminosity and chroma are represented by curves, which can be edited in much the same way as the tone curves in the "Curves" palette. Steepening the luminosity curve increases the difference between bright and dark portions of the image, increasing contrast. Steepening the chroma curve increases color saturation, making colors more vivid. Both editors feature histograms, auto contrast, and white, black, and gray-point sliders. Output sliders are also available to edit the maximum and minimum values for output.

The hue editor features unique controls for unparalleled flexibility when editing colors. Using this tool, a specific range of input colors can be mapped to another range of output colors. This allows all the reds in the image, for example, to be made more orange, or even green or blue.

The desired editor is selected from the menu at the top of the "LCH Editor" palette.

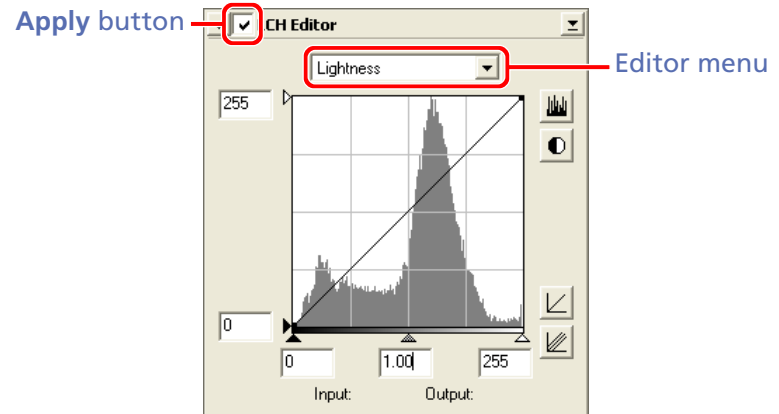**Apply** button — Editor menu

The "LCH Editor" Palette
The "LCH Editor" palette can be used in both the scan window and in image windows.

The "Apply" Button
Changes to the LCH Editor only apply when the button at the top left corner of the "LCH Editor" palette is checked. When this button is checked, changes to settings will be reflected in the image in the active window. The box can be checked and unchecked for a quick "before-and-after" comparison to determine whether changes to settings are having the desired effect.
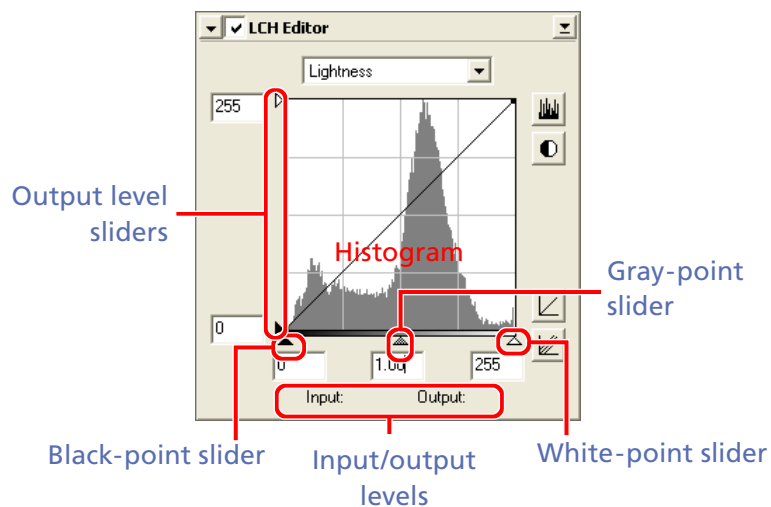
Nikon Color Management (78)
The LCH Editor is only available when the Nikon Color Management System (CMS) is on. If Nikon CMS is off, the tools in the "LCH Editor" palette will be disabled. To use the LCH Editor with a color space that has the same gamut as uncalibrated RGB data obtained directly from the scanner, turn CMS on and select the **Scanner RGB** color-space profile.

The Lightness Editor

Although it affects brightness rather than color, editing luminosity has a similar effect to editing the master curve in the "Curves" palette. Steepening the curve increases the difference between light and dark areas of the image, increasing contrast. Moving the gray point alters the brightness of midtones while preserving detail in highlights and shadows.
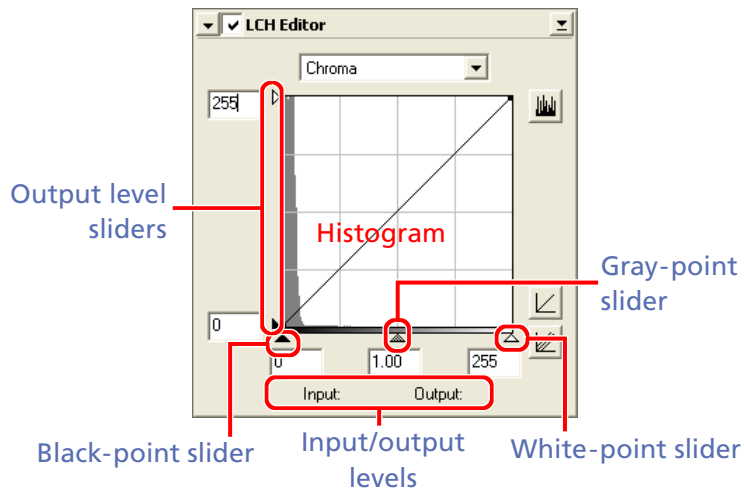

Output level sliders

Histogram

Gray-point slider

Black-point slider

Input/output levels

White-point slider

Item	Description
Histogram	Shows the distribution of pixels of different luminosities in the input. The horizontal axis corresponds to luminosity (in the range 0–255), the vertical axis to the number of pixels.
Output level sliders	Choose the maximum and minimum values for output.
Black-point slider	Choose the minimum input level.
Gray-point slider	Set the gray point (gamma value).
White-point slider	Choose the maximum input level.
Input/output levels	Input and output levels for the point under the cursor in the curve edit display.
📊	Click to view the luminosity distribution for the final image. Click again to view the input luminosity distribution.
📉	Restore the luminosity curve to linear.
📐	Restore all curves in the LCH Editor to linear.
◑	Set maximum and minimum input levels to exclude values for 0.5% of the brightest and darkest pixels in the crop. The percentage of pixels excluded can be adjusted in the **"Advanced Color" category of the "Preferences" dialog (🔍 101)**.

The Chroma Editor

The chroma editor is a useful tool for adjusting color saturation. Steepening the curve increases saturation in the affected range, making colors more vivid. Flattening the curve results in flatter, less vivid colors. Moving the gray point to the left makes the image as a whole more vivid, while moving it to the right "averages out" differences between colors, making the image grayer. One effective way to make full use of the scanner's dynamic range is to steepen the curve in the portions of the histogram that contain the greatest number of pixels, while leaving colors corresponding to a neutral gray unaffected.

Output level sliders

Histogram

Gray-point slider

Black-point slider   Input/output levels   White-point slider

Item	Description
Histogram	Shows the distribution of pixels of different chromas in the input. The horizontal axis shows chroma, the vertical axis the number of pixels.
Output level sliders	Choose the maximum and minimum values for output.
Black-point slider	Choose the minimum input level.
Gray-point slider	Set the gray point (gamma value).
White-point slider	Choose the maximum input level.
Input/output levels	Input and output levels for the point under the cursor in the curve edit display.
🔊	Click to view the chroma distribution for the final image. Click again to view the input chroma distribution.
📈	Restore the chroma curve to linear.
📈	Restore all curves in the LCH Editor to linear.

The Hue Editor

The controls for editing hue are unique, consisting of a rainbow-colored background bisected by a horizontal line which represents the hues (colors) in the original image (input colors). Superimposed on this line is another horizontal line representing the colors in the image after editing (output colors). Before editing, the input line is the same as the output line, so that reds in the input are reproduced as reds in the final image. By changing the shape of hue curve, the user can map input colors to different output colors over a selected portion of the color range.

To edit the hue curve, click once in the edit window to activate the hue editor, then click the point on the curve over the hue you want to edit. Drag this point up or down until it intersects with the desired output color.
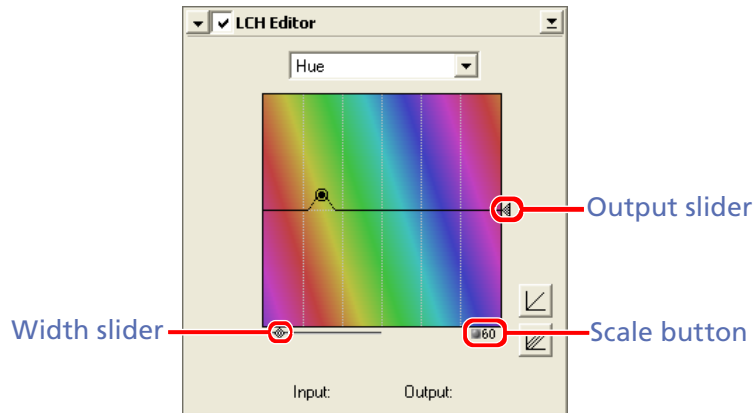
To determine the hue of a specific pixel, move the cursor over the image. The point corresponding to the hue of the pixel under the cursor will be highlighted on the input line.

Item	Description
Width slider	Adjust the width of the curve that passes through the selected point, increasing or decreasing the range of adjacent hues affected by the change.
Scale button	Click to change the vertical scale from 60° through 120° to 180° and back again (the degrees in this scale refer to a 360° color wheel). Increasing the scale increases the range of hues visible in the display, while decreasing the scale increases precision.
Output slider	Map all input colors to different output colors.
⤣	Restore the hue curve to linear.
⤤	Restore all curves in the LCH Editor to linear.

Width slider — Output slider — Scale button

The LCH Editor Settings Menu

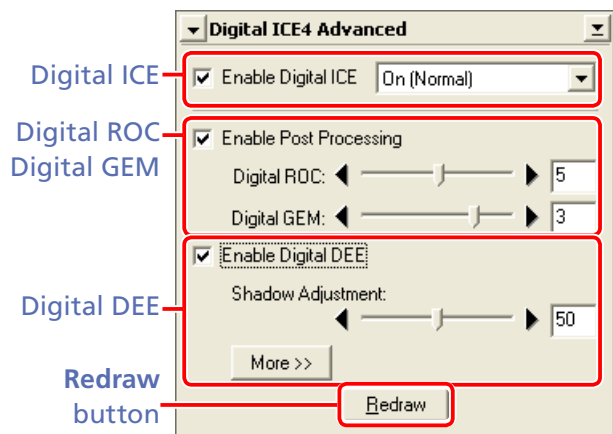Clicking the triangle in the top right corner of the "LCH Editor" palette displays the LCH Editor settings menu.
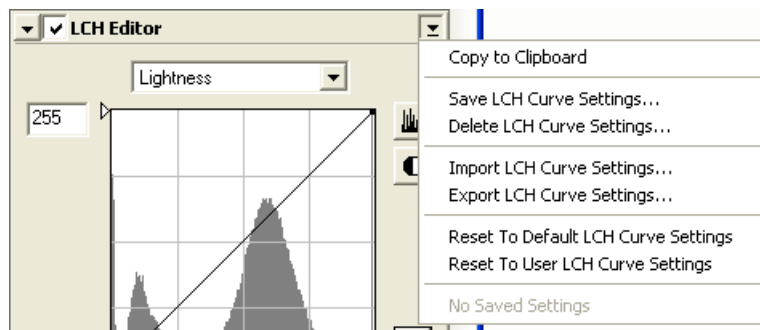
Option	Description
Copy to Clipboard	Copy current LCH Editor settings to the clipboard. These settings can then be pasted into the "LCH Editor" palette for another window by activating the window and selecting **Paste** from the **Edit** menu.
Save LCH Curve Settings…	Save current LCH Editor settings under a user-specified name. These settings will be added to the end of the LCH Editor settings menu, where they can be recalled by selecting the desired settings by name.
Delete LCH Curve Settings…	Delete settings created using the **Save LCH Curve Settings…** option. A dialog will be displayed where the settings to be deleted can be selected by name.
Import LCH Curve Settings…	Import settings created using the **Export LCH Curve Settings…** option.
Export LCH Curve Settings…	Export current settings to a file in a location of your choice. LCH Editor settings files have the extension ".nlv".
Reset to Default LCH Curve Settings	Reset all curves in the LCH Editor to linear.
Reset to User LCH Curve Settings	Restore the default LCH Editor settings created with the **Set User Settings** option in the **scan window settings menu (17)**.

Digital ICE⁴ Advanced (Digital ICE quad Advanced)

The "Digital ICE⁴ Advanced" palette controls the Digital DEE (9000 ED, 5000 ED, and COOLSCAN V ED only), Digital ICE, Digital ROC, and Digital GEM functions built into Nikon scanners to reduce the effects of scratches, dust, fading, film grain, and under- or over-exposure.

Digital ICE

Digital ROC
Digital GEM

Digital DEE

Redraw button

🖉 **The "Digital ICE⁴ Advanced" Palette**
The "Digital ICE⁴ Advanced" palette is only available when the scan window is active.

🖉 **Scanning Glass Microscope Slides**
Turn Digital ICE⁴ Advanced off when scanning glass microscope slides in the FH-G1 or FH-8G1 medical holders (available separately). Digital ICE⁴ Advanced may fail to produce the desired results with glass microscope slides.

Digital ICE—Correcting for Scratches and Dust

Digital ICE (**I**mage **C**orrection and **E**nhancement) reduces the effects of dust and scratches when images are scanned. To use Digital ICE, select **Enable Digital ICE** and choose **On(Normal)** or **On(Fine)** from the Digital ICE menu.

Enable Digital ICE check box
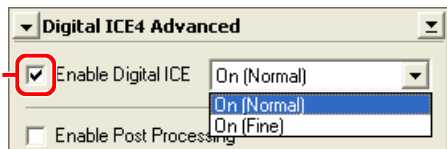
Option	Description
On(Normal)	The image is processed digitally to remove the effects of scratches and dust.
On(Fine)	Use this setting to remove very thin scratches or dust that is barely visible. Note that the overall sharpness of the image may be reduced.

🖉 Scanning Time

Scanning times will increase when Digital ICE is enabled. Turn Digital ICE off to reduce scanning times.

🔍 The Information Panel

When Digital ICE is enabled, the option selected in the Digital ICE menu is displayed in the scan window information panel. A warning icon (⚠) will be displayed if the preview image has not been updated to reflect changes to Digital ICE settings.

To view the effects any changes to Digital ICE settings, click the **Preview** button in the scan window (the preview image can not be updated using the **Redraw** button, which can only be used with Digital ROC, Digital GEM, and Digital DEE). The effects of Digital ICE are reflected in both the "Natural" and "Processed" panels.

🖉 Film Negatives

Noise may appear if Digital ICE is used to process overexposed images or images that have acquired very vivid colors through the developing process. The best results will be obtained in correctly exposed images that have been developed normally.

🖉 Monochrome Film

Digital ICE can not be used with monochrome film unless the film has been developed in color.

🖉 Kodachrome Film

Digital ICE is not recommended when scanning Kodachrome film with the 8000 ED, 4000 ED, or COOLSCAN IV ED. When scanning Kodachrome film with the 9000 ED, 5000 ED, or COOLSCAN V ED, select **Kodachrome** in the film type menu. Depending on the frame scanned, blurring or localized loss of detail may occasionally result when Kodachrome film is scanned with the 5000 ED or COOLSCAN V ED.

Digital ROC—Restoring Faded Colors

Digital ROC (**R**econstruction **o**f **C**olor) digitally restores colors lost through fading of the original film. To use Digital ROC, select **Enable Post Processing** and choose a value for color reconstruction using the **Digital ROC** slider or by entering a value between 0 (Digital ROC off) and 10 (maximum effect) in the text box to its right. The default setting is 5.
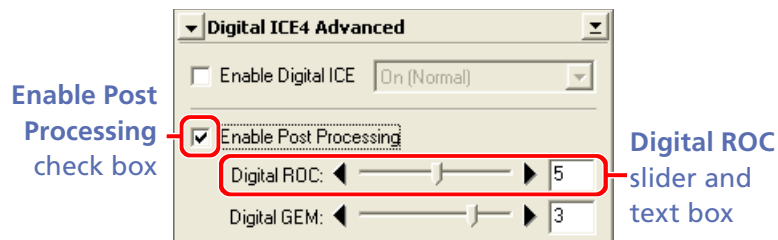
Enable Post Processing check box

Digital ROC slider and text box

To preview the image at the new settings, click the **Redraw** button. If the desired results are not achieved, adjust settings and click the **Redraw** button again.

Scanning and Preview Times

Scanning and preview times will increase when Digital ROC is enabled. To reduce scanning and preview times, remove the check from the **Enable Post Processing** check box.

Monochrome Film/Grayscale Images

Digital ROC may add color to monochrome images or images scanned in grayscale.

Digital ROC

The status of Digital ROC is shown in the scan window information panel. A warning icon ( ) will be displayed if the preview image has not been updated to reflect changes to Digital ROC settings. Digital ROC is not available when the FH-816 or FH-8G1 is used with the 9000 ED or 8000 ED, or when the FH-G1 is used with the 5000 ED, 4000 ED, COOLSCAN V ED, or COOLSCAN IV ED.

Digital GEM—Reducing Film Grain

Digital GEM (Grain Equalization Management) digitally processes images to reduce the effects of film grain. To use Digital GEM, select **Enable Post Processing** and choose a value for grain equalization using the **Digital GEM** slider or by entering a value between 0 (Digital GEM off) and 4 (maximum effect) in the text box to its right. The default setting is 3.

Enable Post Processing check box

Digital GEM slider and text box

To preview the image at the new settings, click the **Redraw** button. If the desired results are not achieved, adjust settings and click the **Redraw** button again.

✎ **Scanning and Preview Times**
Scanning and preview times will increase when Digital GEM is enabled. To reduce scanning and preview times, remove the check from the **Enable Post Processing** check box.

🔍 **Digital GEM**
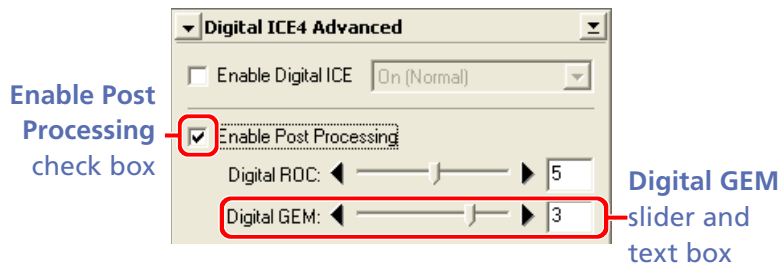The status of Digital GEM is shown in the scan window information panel. A warning icon (⚠) will be displayed if the preview image has not been updated to reflect changes to Digital GEM settings. Digital GEM is not available when the FH-816 or FH-8G1 is used with the 9000 ED or 8000 ED, or when the FH-G1 is used with the 5000 ED, 4000 ED, COOLSCAN V ED, or COOLSCAN IV ED.
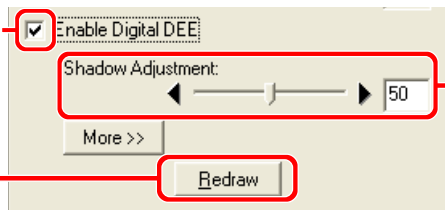
Digital DEE—Enhancing Detail in Shadows and Highlights

Digital DEE (**D**ynamic **E**xposure **E**xtender) reveals details in shadows and highlights, correcting for underexposure in back-lit subjects or shaded areas and for overexposure in brightly lit areas. Digital DEE is only available with 9000 ED, 5000 ED, and COOLSCAN V ED film scanners.

Enhancing Details in Shadows

To enhance details in shadows, select **Enable Digital DEE** and adjust shadow brightness using the **Shadow Adjustment** slider or by entering a value between 1 and 100 in the text box to its right. The larger the value, the brighter shadows in the image will be. The default setting is 50.

Enable Digital DEE check box

Shadow Adjustment slider and text box

Redraw button

✎ **Selecting a Crop**

When using Digital DEE, select a crop that excludes the frame borders and other unexposed areas of the film.
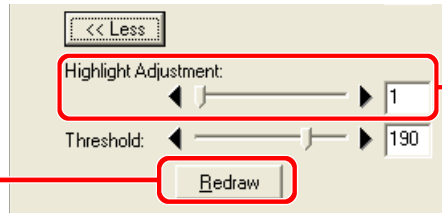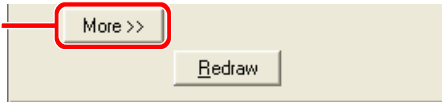
✎ **Monotone Shadows**

Digital DEE has no effect if details in shadows have been totally obliterated, leaving shadows a single, uniform color.

To preview the image at the new settings, click the **Redraw** button. If the desired results are not achieved, adjust settings and click the **Redraw** button again.

Before processing	After processing

🔍 **Digital DEE**

The status of Digital DEE is shown in the scan window information panel. A warning icon (⚠) will be displayed if the preview image has not been updated to reflect changes to Digital DEE settings. Digital DEE is not available when the FH-816 or FH-8G1 is used with the 9000 ED, or when the FH-G1 is used with the 5000 ED or COOLSCAN V ED.

✎ **Scanning and Preview Times**

Scanning and preview times will increase when Digital DEE is enabled. To reduce scanning and preview times, remove the check from the **Enable Digital DEE** check box.

✎ **Medium-Format Film (9000 ED Only)**

When using Digital DEE to scan medium-format film under Windows, adjust "Crop" palette settings so that file size is 169 MB or less. A file of 169 MB is equivalent to a full frame of 6 × 9 film (crop size 6588 × 4482 pixels) scaled to 100% at 2000 dpi.

Enhancing Details in Highlights

Digital DEE can also be used to reveal details in highlights where the background is much brighter than the subject or the subject much brighter than the background. To enhance details in highlights, select **Enable Digital DEE** and click **More**.

More button

Highlight Adjustment slider and text box

Redraw button

Adjust highlights using the **Highlight Adjustment** slider or by entering a value between 1 and 100 in the text box to its right. Increasing highlight adjustment increases contrast in highlights, while decreasing highlight adjustment has the opposite effect. The default value is 1.

To preview the image at the new settings, click the **Redraw** button. If the desired results are not achieved, adjust settings and click **Redraw** again.

Before processing

After processing

Monotone Highlights

Digital DEE has no effect if details in highlights have been totally obliterated, leaving highlights a single, uniform color.

Defining "Shadows" and "Highlights"

The **Threshold** slider in the detailed view of the "Digital DEE" panel determines the border between shadows and highlights.

Threshold slider and text box
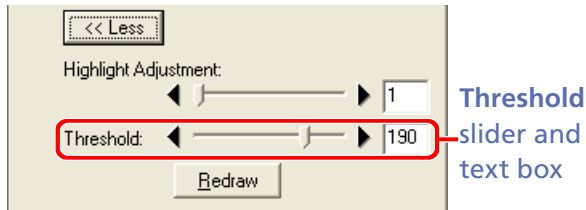
Moving the slider to the right or entering a higher value in the **Threshold** text box increases the range of tones affected by the **Shadow Adjustment** slider and reduces the range of tones affected by the **Highlight Adjustment** slider.

Tone range affected by **Shadow Adjustment**
Tone range affected by **Highlight Adjustment**

Shadows   Highlights
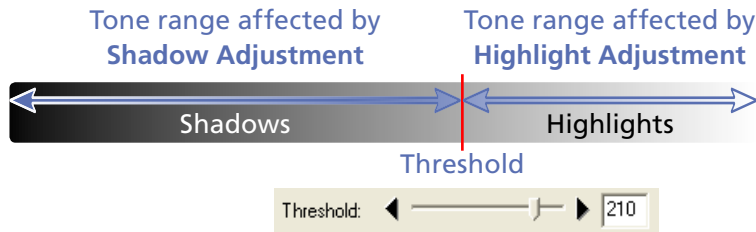
Threshold

Try increasing the threshold value if shadow brightness fails to brighten shadows in the desired tone range, or if highlight adjustment is affecting too great an area.

Moving the slider is to the left or entering a lower value in the **Threshold** text box increases the range of tones affected by the **Highlight Adjustment** slider and reduces the range of tones affected by the **Shadow Adjustment** slider.

Tone range affected by **Shadow Adjustment**
Tone range affected by **Highlight Adjustment**

Shadows   Highlights
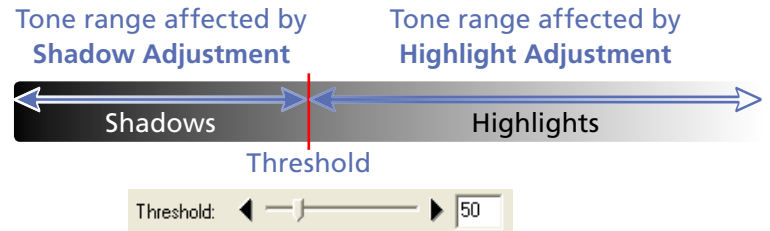
Threshold

Try decreasing the threshold value if highlight adjustment fails to increase contrast in the desired tone range, or if shadow brightness is affecting too great an area.
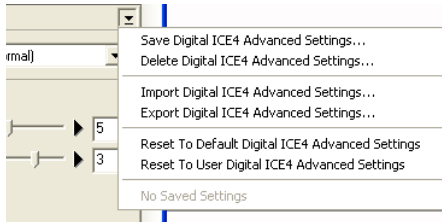
Threshold

Ideally, the threshold for shadow adjustment should be twenty to forty greater than the highest of the R and G values in the brightest shadows. The threshold for highlight adjustment should be twenty to forty less than lowest of the R and G values in the darkest highlights. To choose a threshold that can be used for both shadows and highlights, enter the average of the highest value (R or G) in the brightest shadows and the lowest value (R or G) in the darkest highlights. Color values can be determined by moving the cursor over the image and observing the R and G values in the scan window information panel.
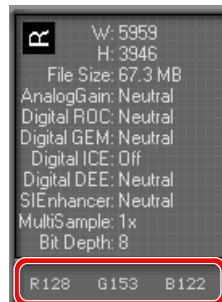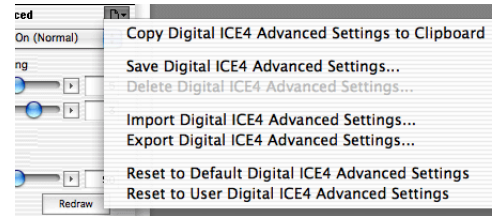
The Digital ICE⁴ Advanced Settings Menu

Clicking the triangle in the top right corner of the "Digital ICE⁴ Advanced" palette displays the Digital ICE⁴ Advanced settings menu.
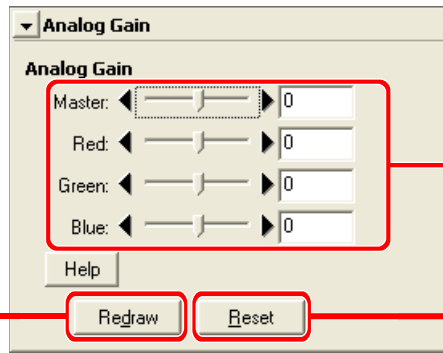

Windows   *Macintosh*

Option	Description
Copy Digital ICE⁴ Advanced Settings to Clipboard (Macintosh only)	Copy current Digital ICE⁴ Advanced settings to the clipboard. These settings can then be pasted into the "Digital ICE⁴ Advanced" palette by selecting **Paste** from the **Edit** menu.
Save Digital ICE⁴ Advanced Settings…	Save current Digital ICE⁴ Advanced settings under a user-specified name. These settings will be added to the end of the Digital ICE⁴ Advanced settings menu, where they can be recalled by selecting the desired settings by name.
Delete Digital ICE⁴ Advanced Settings…	Delete settings created using the **Save Digital ICE⁴ Advanced Settings…** option. A dialog will be displayed where the settings to be deleted can be selected by name.
Import Digital ICE⁴ Advanced Settings…	Import settings created using the **Export Digital ICE⁴ Settings…** option.
Export Digital ICE⁴ Advanced Settings…	Export current settings to a file in a location of your choice. Digital ICE⁴ Advanced settings files have the extension ".nla".
Reset to Default Digital ICE⁴ Advanced Settings	Turn off all Digital ICE⁴ Advanced functions and restore all sliders to default settings.
Reset to User Digital ICE⁴ Advanced Settings	Restore the default Digital ICE⁴ Advanced settings created with the **Set User Settings** option in the **scan window settings menu (🔘 17)**.

Analog Gain

The "Analog Gain" palette is used to adjust color by modifying exposure for the colored elements in the scanner's light source. Gain is measured in **E**xposure **V**alues (EVs), the same unit used for measuring exposure compensation on many cameras.

Analog gain sliders and text boxes

Redraw button

Reset button

The "Analog Gain" palette contains the following items:

Item	Description
Master	Adjust exposure for all elements by dragging the slider or by entering a value between –2.00 and +2.00 in the text box to its right.
Red, **Green**, **Blue**	Adjust exposure for the red, green, and blue elements by dragging the sliders or by entering values between –2.00 and +2.00 in the text boxes to their right.
Redraw	Update the preview image to reflect changes to analog gain.
Reset	Reset all analog gain sliders to ±0.

The "Analog Gain" Palette

The "Analog Gain" palette is only available when the scan window is active.

Exposure Values

Exposure Values are a measure of the quantity of light that falls on the scanning element (**C**harge-**C**oupled **D**evice, or CCD). At +1 EV, the CCD is exposed to twice the normal amount of light, while at –1 EV, the amount of light is halved. EVs are sometimes referred to as "steps."

Smear

Choosing too high a value for exposure may produce "smear" or other defects in the scanned image.
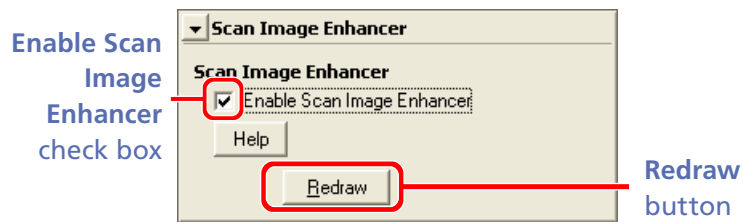
Analog Gain

The status of analog gain is shown in the scan window information panel. A warning icon ( ) will be displayed if the preview image has not been updated to reflect changes to analog gain.

Scan Image Enhancer (9000 ED, 5000 ED, COOLSCAN V ED Only)

The Scan Image Enhancer automatically adjusts brightness and color saturation during scanning to produce an image with optimal contrast. It is only available with 9000 ED, 5000 ED, and COOLSCAN V ED film scanners.

To use the Scan Image Enhancer, select **Enable Scan Image Enhancer** in the "Scan Image Enhancer" palette.

Enable Scan Image Enhancer check box

Redraw button

Automatic Color, Brightness, and Contrast Adjustment

To preview the effects of the Scan Image Enhancer, click **Redraw**.

🔍 **Scan Image Enhancer**
The status of the Scan Image Enhancer is shown in the scan window information panel. A warning icon (⚠️) will be displayed if the preview image has not been updated to reflect changes to the Scan Image Enhancer.

🖊 **Scanning Time**
Scanning times may increase slightly when the Scan Image Enhancer is enabled.

🖊 **Dark Images**
If the image is dark, the Scan Image Enhancer may have no effect or may make the scanned image darker. Turn the Scan Image Enhancer off if it fails to produce the desired results.

🖊 **The "Scan Image Enhancer" Palette**
The "Scan Image Enhancer" palette is only available when the scan window is active.

Scanner Extras

The options available in the "Scanner Extras" palette vary with the model of scanner connected and the film holder or adapter in use.
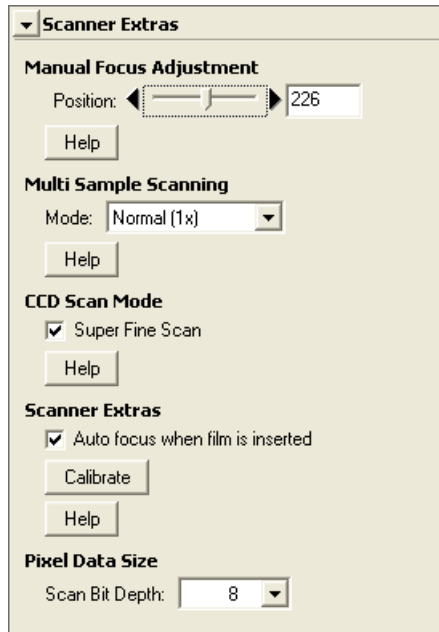
"Scanner Extras" palette for 9000 ED
with FH-835S film holder
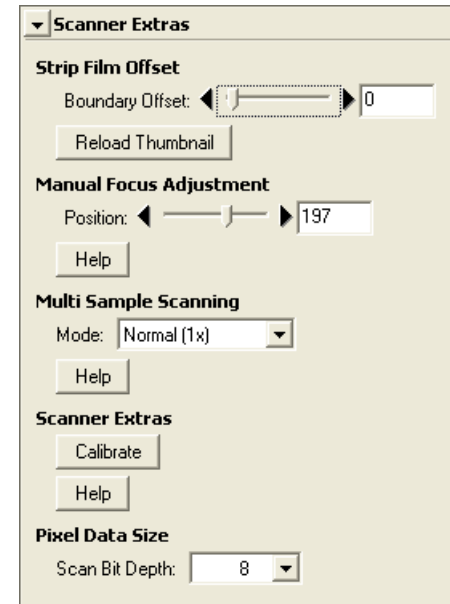
"Scanner Extras" palette for 5000 ED
with SA-21 adapter

📎 The "Scanner Extras" Palette

The "Scanner Extras" palette is only available when the scan window is active.

The "Scanner Extras" palette contains the following options:

Scanner	Item	Description
All (SA-21, SA-30, FH-869S, FH-869G only)	**Strip film offset**	Reposition film to match the scan position.
All	**Manual focus adjustment**	Focus scanner manually using slider or by direct text entry.
	Perform autofocus when film is inserted	Perform autofocus when slide is inserted in MA-21/MA-20 (S) (5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED). When holder is inserted in 9000 ED or 8000 ED, perform autofocus on first frame (FH-869S, FH-869G, FH-869GR excluded).
	Calibration	Recalibrate scanner when film has been left in device for extended periods.
	Pixel data size	Control amount of color information acquired for each pixel (scan bit depth).
5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED (IA-20 (S) only)	**Crop choices**	Choose crop settings to match different APS (IX-240) aperture settings.
9000 ED, 8000 ED, 5000 ED, 4000 ED	**Multi-sample scanning**	Increase accuracy by increasing the number of passes the scanner makes over the image.
9000 ED, 8000 ED	**CCD scan mode**	Select **Super Fine Scan** to perform a single-line scan instead of the normal three-line scan.
5000 ED, 4000 ED (SF-210/SF-200 (S) only)	**Slide feeder scan**	Choose the number of slides scanned each time the **Scan** button is clicked.

Strip Film Offset

This is option is used to position the film in the scan aperture. It is only available with the SA-21, FH-869S, and the optional SA-30 and FH-869G.
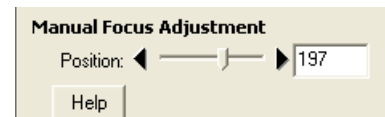
To use this option, the thumbnail drawer must be open with thumbnails displayed. Select the desired thumbnail and adjust its position using the **Boundary Offset** slider or by entering a value in the text box to its right. If the right edge of the thumbnail is cut off, move the slider to the right or enter a larger value to bring it into position; if the left edge is cut off, move the slider to the left or enter a smaller value. Note that the direction of adjustment changes when thumbnails are flipped or rotated.

To view the effects of changes to the boundary offset, click the **Reload Thumbnail** button and check the results in the thumbnail drawer. The changes will not be reflected in the preview area until the **Preview** button is clicked.

Manual Focus Adjustment

Use manual focus adjustment when the desired results can not be achieved using auto-focus. Adjust focus using the **Position** slider or by entering a value in the text box to its right, then click the **Preview** button in the scan window to refocus the scanner. The new focus position will be used until the next time film is inserted or Nikon Scan is restarted. To focus the scanner automatically, click the autofocus button in the scan window control area.

Strip Film Offset

Numerical boundary offset ranges are shown below.

5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED

First frame	Subsequent frames
0–144	-144–144

Medium-format film (9000 ED, 8000 ED)

Frame size	First frame*	Subsequent frames
6×4.5	0–69	-69–69
6×6	0–93	-93–93
6×7	0–114	-114–114
6×8	0–127	-127–127
6×9	0–137	-137–137

*Small negative values may be possible with the first frame of medium-format film.

Perform Autofocus When Film Is Inserted

If this option is selected when the MA-21/MA-20 (S) slide-mount adapter is inserted in the 5000 ED, 4000 ED, COOLSCAN V ED, or COOLSCAN IV ED, an autofocus operation will automatically be performed when a slide is inserted.

If this option is selected when the 9000 ED or 8000 ED is connected, an autofocus operation will be performed on the first frame when a film holder is inserted (an autofocus operation will not be performed when the FH-869S, FH-869G, or FH-869GR is inserted).

Calibration

If the scanner is left on for an extended period, the temperature inside the scanner will rise and the scanner may need to be recalibrated. Click **Calibrate** to recalibrate the scanner.

If the MA-21 or MA-20 (S) is inserted, remove any slides from the adapter before recalibrating. Users of the IA-20 (S) will be prompted to rewind the film before calibration begins. Film will automatically be ejected from the SA-21, SA-30, 9000 ED, or 8000 ED before calibration begins, and will automatically be reloaded when calibration is complete.

The Status LED
The scanner status LED will blink while the scanner is being recalibrated. Do not perform any additional operations in Nikon Scan until the status LED has stopped blinking.

Pixel Data Size

The option selected in the **Scan Bit Depth** menu determines the number of bits acquired per color channel for each pixel in the image. The options available depend on the scanner used:

- 9000 ED, 5000 ED: 16 bits, 8 bits
- COOLSCAN V ED, 8000 ED, 4000 ED: 14 bits, 8 bits
- COOLSCAN IV ED: 12 bits, 8 bits

IX240 Crop Choices

The following crop choices are available when the optional IA-20 (S) APS (IX-240) film adapter is inserted in the 5000 ED, 4000 ED, COOLSCAN V ED, or COOLSCAN IV ED:

Crop choice	Description
Classic	The size of the initial crop is adjusted for the "classic" APS setting, with a width-height ratio the same as 35-mm film (3:2).
Wide	The size of the initial crop is adjusted for the "wide" APS setting, with a width-height ratio of 16:9.
Panorama	The size of the initial crop is adjusted for the "panorama" APS setting, with a width-height ratio of 3:1.

Bit Depth, Color, and File Size

Scanning at a bit depth of eight bits yields 256 shades per pixel for each component channel of the current color model (if the image is three-color RGB, the result is 24-bit color, which can express roughly 16.7 million different color values). The maximum bit depth depends on the scanner connected:

- 9000 ED, 5000 ED: 16 bits (65,536 shades per channel)
- COOLSCAN V ED, 8000 ED, 4000 ED: 14 bits (16,348 shades per channel)[1]
- COOLSCAN IV ED: 12 bits (4,096 shades per channel)[1]

Scanning at the maximum bit depth results in larger files but increases accuracy.

[1] Images scanned at fourteen and twelve bits are converted to sixteen bits when opened in the host application.

Multi-Sample Scanning

In multi-sample scanning (available only with the 9000 ED, 8000 ED, 5000 ED, and 4000 ED), the scanner

Multi Sample Scanning
Mode: Normal (1x) ▼

makes multiple passes over the image and averages the results to reduce the effects of electronic "noise," producing more accurate reproductions with smoother changes in tone.

To use multi-sample scanning, select the desired setting from the **Mode** menu:
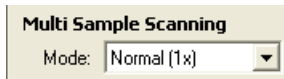
Mode	No. of passes	Description
Normal (1×)	1	Multi-sample scanning off.
Good (2×)	2	Precision increased by equivalent of one bit per channel.
Fine (4×)	4	Precision increased by equivalent of two bits per channel.
More Fine (8×)	8	Precision increased by equivalent of three bits per channel.
Super Fine (16×)	16	Precision increased by equivalent of four bits per channel.

CCD Scan Mode

This option is available only with 9000 ED and 8000 ED film scanners. To speed scanning, these scanners use a three-line CCD. Although the scanner automatically

CCD Scan Mode
☑ Super Fine Scan
Help

compensates for slight differences in output between each line, the very small differences that do remain could cause a drop in image quality when, for example, the image is processed by sharply steepening curves to increase contrast. This can be prevented by selecting **Super Fine Scan** to scan the image with a single line (note that scanning times will triple). **Super Fine Scan** produces no noticeable improvement when scanning images with a standard tone curve.
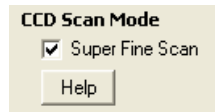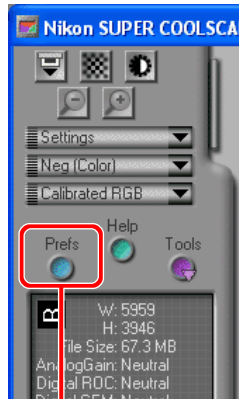
Slide Feeder Scan

This option is available when an optional SF-210 or SF-200 (S) slide adapter is used with the 5000 ED or 4000 ED. En-ter the number of slides to be scanned

Slide Feeder Scan
Feed Images: 1

in the **Feed Images** text box. This is the number of slides that will be scanned in sequence when the **Scan** button is clicked. To scan all the slides in the feeder, enter a large value (the maximum value is 99).
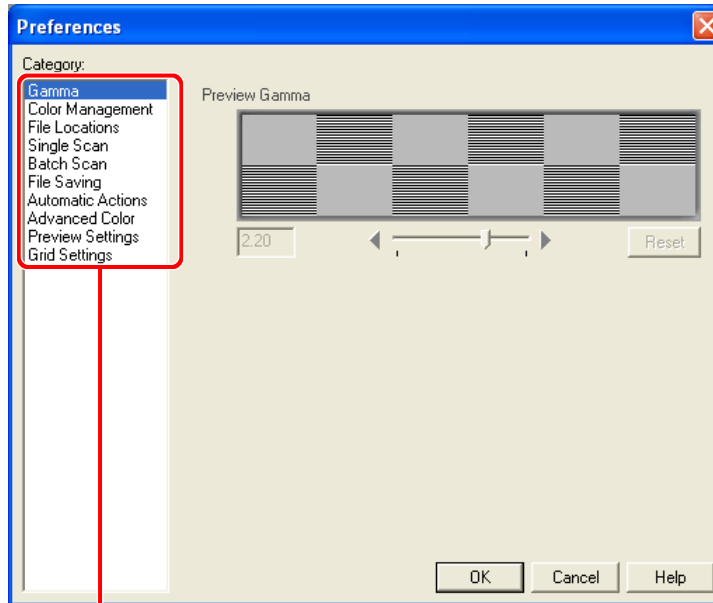
✏ **Scanning Time**
Scanning time increases in proportion to the number of passes.

Preferences

The settings in the "Preferences" dialog are used to fine-tune the controls in the scan window. To view the "Preferences" dialog, click the **Prefs** button in the control area of the scan window.
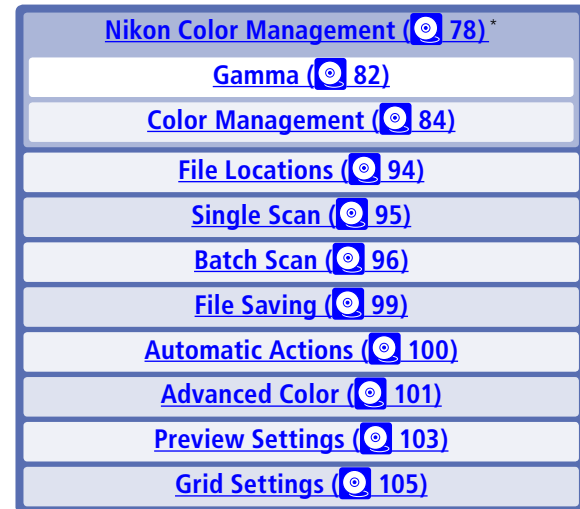
The settings in the "Preferences" dialog are divided into the categories shown below. Click the links for more information.

Prefs button

Categories

Nikon Color Management (🔘 78) *

Gamma (🔘 82)

Color Management (🔘 84)

File Locations (🔘 94)

Single Scan (🔘 95)

Batch Scan (🔘 96)

File Saving (🔘 99)

Automatic Actions (🔘 100)

Advanced Color (🔘 101)

Preview Settings (🔘 103)

Grid Settings (🔘 105)

*Read "Nikon Color Management" before reading the "Gamma" and "Color Management" sections.

🔘 **Nikon Scan Menus**

When Nikon Scan is used as a "stand-alone" application, the "Preferences" dialog can also be accessed by selecting **Preferences…** from the **Edit** menu (in Mac OS X, select **Preferences…** from the Nikon Scan application menu).

Nikon Color Management

The Nikon Color Management System, or Nikon CMS, ensures that image data from Nikon scanners are reproduced consistently and accurately on monitors or printers. With this powerful tool, colors can be manipulated in a calibrated RGB color model before the data are passed to the host application. Profiles detailing the color characteristics of the chosen color model and the output device (monitor or printer) ensure that colors will be reproduced accurately in almost any operating environment.

Nikon CMS involves two categories of preferences, one ("Gamma") for use when Nikon CMS is off and the other ("Color Management") for use when Nikon CMS is on. "Gamma" specifies how data from the scanner will be modified for display on the monitor. Because monitor profiles can not be used when Nikon CMS is off, this adjustment must be made manually. "Color Management" is used to turn Nikon CMS on and off and select the profiles for use with the monitor and with the CMYK and calibrated RGB color models when Nikon CMS is on.

CMYK

Images can not be scanned in CMYK. If CMYK data are required, convert images to CMYK before saving them to disk. Note that images can only be saved in CMYK if Nikon CMS is on (Nikon CMS is on by default).

Turning Nikon CMS Off

In general, much better results can be achieved with Nikon CMS on. It may however be necessary to turn color management off to:

- Speed processing

  If the computer has a slow CPU, the processing required for color management may result in longer scan times. Try turning color management off for reduced scan times.

- Edit data from the scanner directly

  Advanced users may want to turn Nikon CMS off to edit uncalibrated RGB data from the scanner.

How Nikon CMS Works

When image data are passed from an input device, such as a scanner, to an output device, such as a monitor or printer, color management ensures that the image displayed on the output device "looks the same" as the original. To accomplish this task, the color management system must have information about the color characteristics of both the input and output devices, as well as the color space used for editing. The files containing this information are called "ICC profiles." Nikon Scan uses the following three types of profile:

Input Profiles

Input profiles provide information on the input device, i.e., the Nikon scanner. Fixed profiles detailing the color characteristics of supported Nikon scanners are provided with Nikon Scan. An input profile is selected automatically based on the model of scanner used and the type of media (positive or negative) being scanned.

Color-Space Profiles

Separate profiles are available for the RGB and CMYK color models. Nikon Scan comes with a selection of profiles for the RGB color model, while CMYK profiles for color printers are usually provided by the manufacturer. Color-space profiles are used when editing images in the scan window and when making the final scan.

Monitor Profiles

Monitor profiles are usually provided by the manufacturer, although profiles for some common monitor types may be included with the computer operating system. Monitor profiles apply when images are displayed on a monitor, for example when an image is displayed in the preview area or an image window.

Creating Monitor Profiles

If desired, Adobe Photoshop can be used to create a monitor profile for a specific environment. This profile can then be used in Nikon Scan. For information on creating monitor profiles, see the documentation provided with Adobe Photoshop. This option is not available in Adobe Photoshop LE.

The Scanning Process

The illustration below shows the role Nikon CMS plays in the scanning process. CMS profiles are shown in blue, user operations in red.

When Nikon CMS is on, uncalibrated RGB image data from the scanner are converted to grayscale or calibrated RGB, depending on the color model selected in the scan window. RGB data are processed according to the profile selected for the calibrated RGB color space. These data are stored in memory so that the color model can be changed without performing another preview. Any changes made using the color enhancement and Unsharp Mask tools also apply to these data. When the image is displayed in the preview window, the monitor profile is used to ensure that the preview image is as true as possible to the data in memory.

When the **Scan** button is clicked to perform the final scan, the scan data are processed according to the selected color-space profile and any changes that were made using the color enhancement and Unsharp Mask tools in the scan window. The data are then transferred to the host application. Where possible, the color-space profile is transferred to the host application together with the image data. The TWAIN interface used in Windows, however, does not allow profiles to be passed to another application, with the result that under Windows the profile is only transferred to the host when Nikon Scan is used as a "stand-alone" application (note that profile information is lost when the image is saved in a format such as BMP that does not allow the profile to be recorded). When images are displayed in image windows in Nikon Scan, the monitor profile ensures that the image on the screen reflects the original as closely as possible.

Before preview	Preview	Image processing	Scan	Host application
Scanner Extras Digital ICE⁴ Advanced Scan Image Enhancer Analog Gain	Preview	Curves Color Balance LCH Editor Unsharp Mask — Monitor profile → Processed tab	Scan	
Film type selection Color model and profile selection	Scanner input profile → Color-space profile	New color-space profile ← Changes to color model or color-space profile Monitor profile → Natural tab		

Scanning with Nikon CMS Off

If **Use Nikon Color Management System** is not selected in the "Color Management" category, profiles can not be used to ensure that the data from the scanner are reproduced accurately when passed to another application or displayed in the monitor. Because the color profiles required for a calibrated RGB color space are not available when Nikon CMS is off, images can only be scanned as uncalibrated RGB or grayscale. Similarly, the absence of a monitor profile means that gamma adjustment must be used to correct the image for display on the monitor or for editing in another application. These adjustments to gamma are made in the "Gamma" category of the "Preferences" dialog.

The illustration below shows how scanning proceeds when Nikon CMS is off. The image shown in the preview window is adjusted for display in the monitor according to the value chosen for preview gamma in the "Gamma" category. When the **Scan** button is clicked, the main scan gamma and any changes to curves and color balance are passed to the scanner, where they are applied to scan data before the image is transferred to the host application (if Nikon Scan is used as a "stand-alone" application, the value for preview gamma is passed to the scanner instead of main scan gamma). The LCH Editor and Unsharp Mask tools can not be used when Nikon CMS is off.
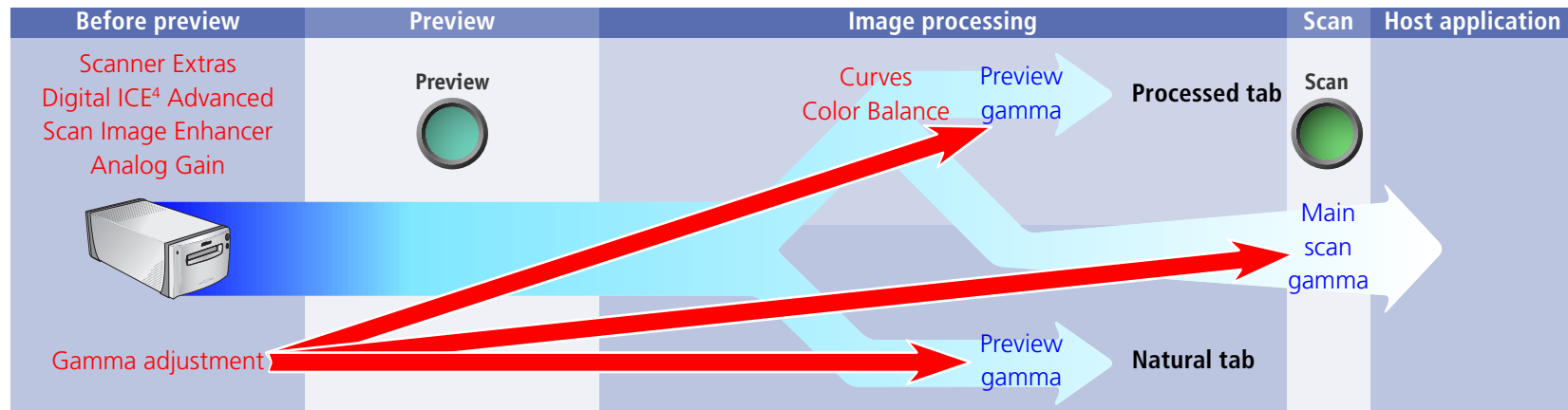
Gamma

When the **Use Nikon Color Management System** option in **the "Color Management" category ([⊙] 84)** is off, the controls in the "Gamma" category are used to adjust data from the scanner so that they display correctly when previewed on the monitor or opened in another application.
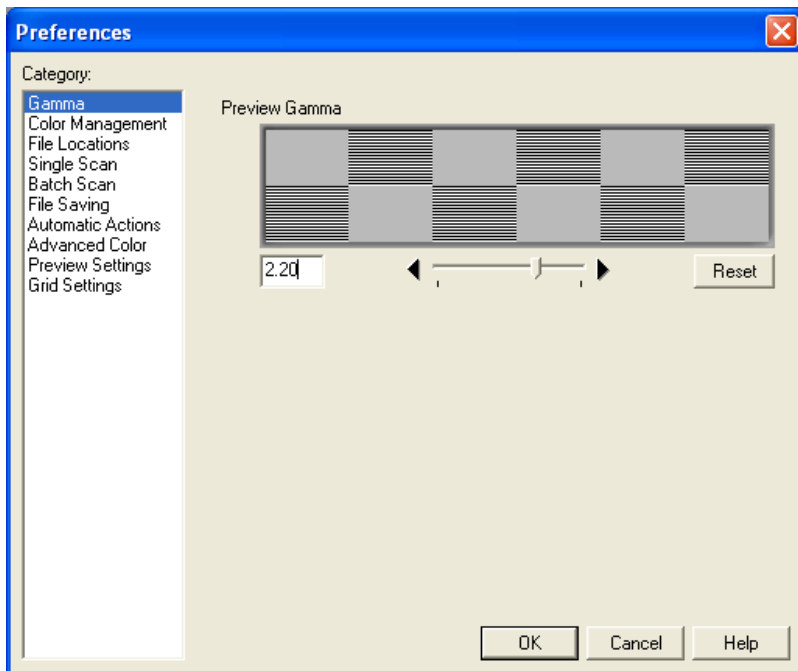
Preview gamma

Preview gamma applies to the image displayed in the preview area of the scan window. In general, preview gamma is solely for display in the preview area and does not apply to the image data that are passed to the host application when the **Scan** button is clicked. There are two exceptions to this rule, however. The first is when Nikon Scan is used as a "stand-alone" application, the second when **Use preview gamma** is selected as the main scan gamma option. In these cases preview gamma is applied to image data passed to the host application.

Preview gamma defaults to a value of 1.8 on the Macintosh, 2.2 on Windows computers. To choose a setting suited to the current monitor, adjust the value so that the patterns of gray lines and dots above the slider match in density. Gamma can be set by entering a value directly into the text box or by moving the slider. When making this adjustment, set the resolution on the monitor to a low value such as 640×480 and sit as far away from the monitor as possible. To restore the default setting for your platform, click **Reset**.

Main scan gamma

Main scan gamma options are only visible when Nikon Scan is being used as a TWAIN source or acquire plug-in for another program (when Nikon Scan is used as a "stand-alone" application, preview gamma automatically applies both to the preview image and to the final scan). Image data passed to the host application are modified according to the option chosen here. Three options are available:
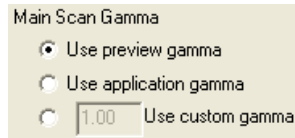
Use preview gamma

The gamma value chosen for preview gamma is applied before the data are passed to the host application. Use this setting when the host application does not support independent gamma settings and you want the final image to be modified for display on your monitor.

Use application gamma

In some environments, a value for gamma can be chosen in the host application and passed to the Nikon Scan plug-in. When **Use application gamma** is selected, this value is applied to the main scan data before they are passed to the host application.

Two conditions must be fulfilled if this option is to be effective. First, the interface between the application and Nikon Scan must allow the gamma value to be passed to the Nikon Scan plug-in. The TWAIN interface used under Windows does not, however, allow the gamma value to be passed to the TWAIN source (i.e., to Nikon Scan). Consequently, in the Windows version of Nikon Scan a default value of 2.2 is used for main scan gamma whenever **Use application gamma** is selected. Second, the application must support gamma transfer. If **Use application gamma** is selected with a Macintosh application that does not support this feature, Macintosh system gamma (1.8) will be used.

Use custom gamma

When this option is selected, a value for main scan gamma can be entered in the text box.

Color Management

The profiles used by the Nikon Color Management System are specified in the "Color Management" category.

The profile chosen here is used to display images on your monitor.

Warning: Changing the status of the Nikon Color Management System will not take effect until Nikon Scan is quit and relaunched.
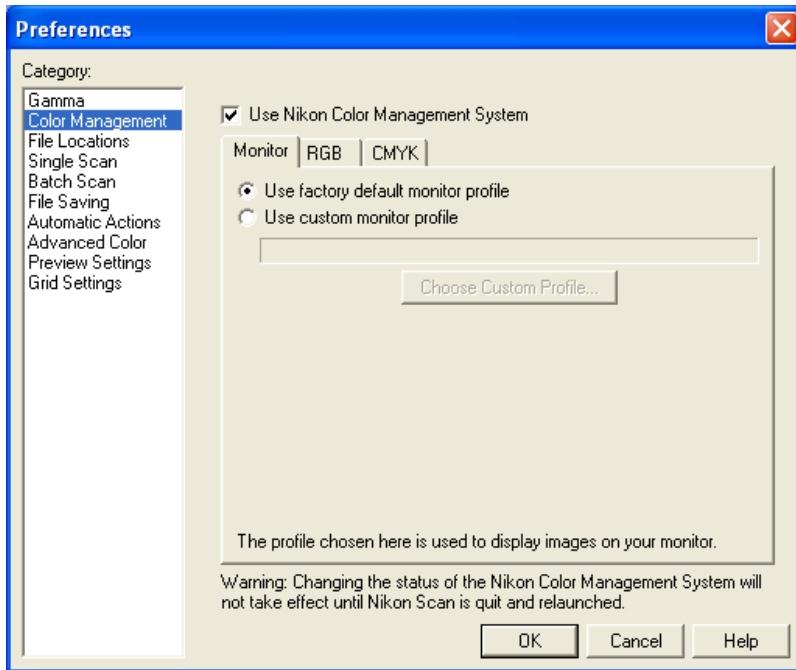
Use Nikon Color Management System

This option turns the Nikon Color Management System on and off. Changes to this setting only take effect after Nikon Scan has been quit and restarted.

When Nikon CMS Is On…

…images are processed to ensure consistent color reproduction, as described in "**How Nikon CMS Works" (🔘 79)**. Because color management profiles typically contain their own settings for gamma, the controls in the Gamma tab are dimmed and inactive.

When Nikon CMS Is Off…

…monitor and color-space profiles are not used, and the controls in the Color Management tab are dimmed and inactive. The only tool available for ensuring that colors from the scanner will be displayed accurately on the monitor is the **"Gamma" category (🔘 82)**. The only adjustments made to the image before it is passed to the host application are gamma adjustment and changes to curves and color balance made in the scan window.

The "Monitor" Tab

The "Monitor" tab specifies the profile that will be used when images are displayed on your monitor, either in the scan window preview area or a Nikon Scan image window. Monitor profiles contain information about the color and gamma characteristics of the monitor, allowing images to be adjusted for more accurate color reproduction.
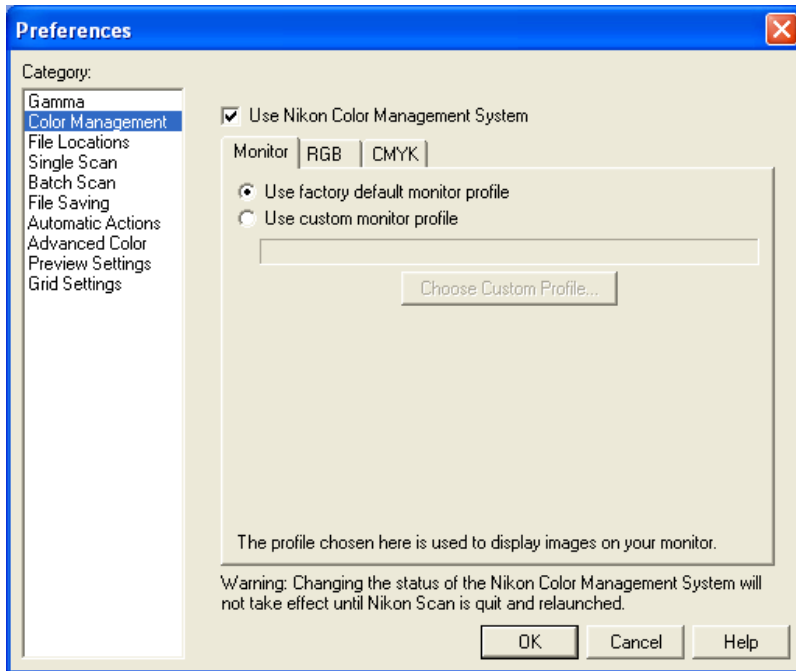
Use factory default monitor profile (default)

Nikon Scan is supplied with default monitor profiles for use when no other profile is available (see below). To use the default profile for your platform, select **Use factory default monitor profile**.

Default Windows Monitor Profile (Gamma 2.2)

The default Windows monitor profile ("NkMonitor_Win.icm") is identical to the sRGB profile.

Default Macintosh Monitor Profile (Gamma 1.8)

The default Macintosh monitor profile ("NkMonitor_Mac.icm") is identical to the profile used for Apple 17″ monitors with a D_{50} white point.

Use custom monitor profile

Use this option to select a profile supplied by the company that manufactured the monitor. When this option is selected, the **Choose Custom Profile…** button will be active. Clicking this button displays a standard "open file" dialog; navigate to the disk and folder containing the manufacturer's profile. The path to the selected profile will appear in the text box below the **Use custom monitor profile** radio button.

The "RGB" Tab

The "RGB" tab is used to select a color-space profile for the calibrated RGB color model. The profile used can be selected from the **Color space** menu.
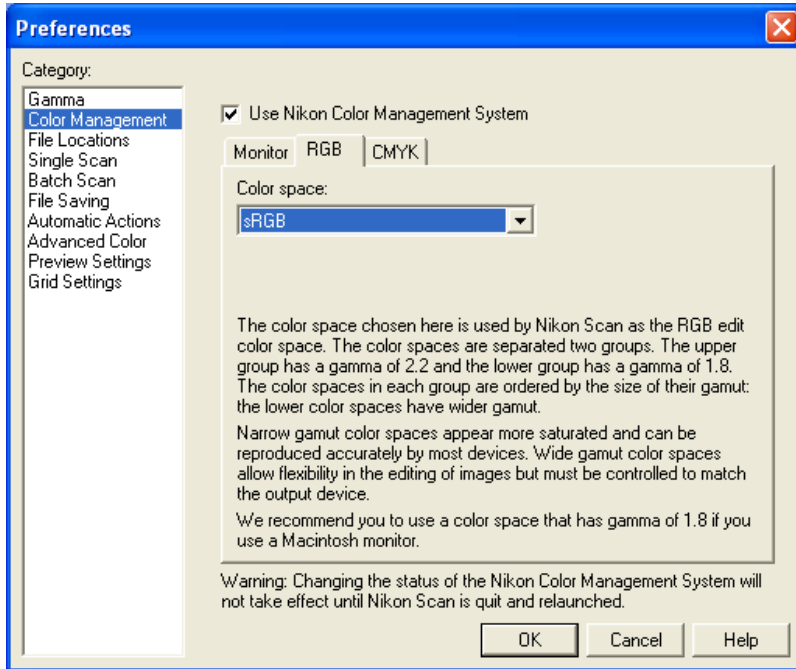
Each of the profiles listed may be classified according to its gamma value and gamut. *Gamma* is a fundamental characteristic of imaging systems which determines the intensity of the output signal relative to the input; in human terms, gamma controls the subjective brightness of images through alterations to the output level for mid-tones. Windows and Macintosh systems process video signals differently, and these differences are reflected in the difference in the standard gamma values for these platforms. The default system gamma for Macintosh computers is 1.8, the *de facto* standard for Windows systems, 2.2. Nikon CMS includes eight RGB profiles with a Windows gamma of 2.2 (sRGB, Bruce RGB, NTSC [1953], Adobe RGB [1988], CIE RGB, Wide Gamut RGB, compensated Wide Gamut RGB, and Scanner RGB), and three profiles with a gamma value of 1.8 (Apple RGB, ColorMatch RGB, and compensated Apple RGB), for use on the Macintosh. When scanning images, choose a profile with a gamma value suited to the system on which the image will be edited.

The "CMYK" Tab

The CMYK sheet is used to select a profile for use with the CMYK color model.
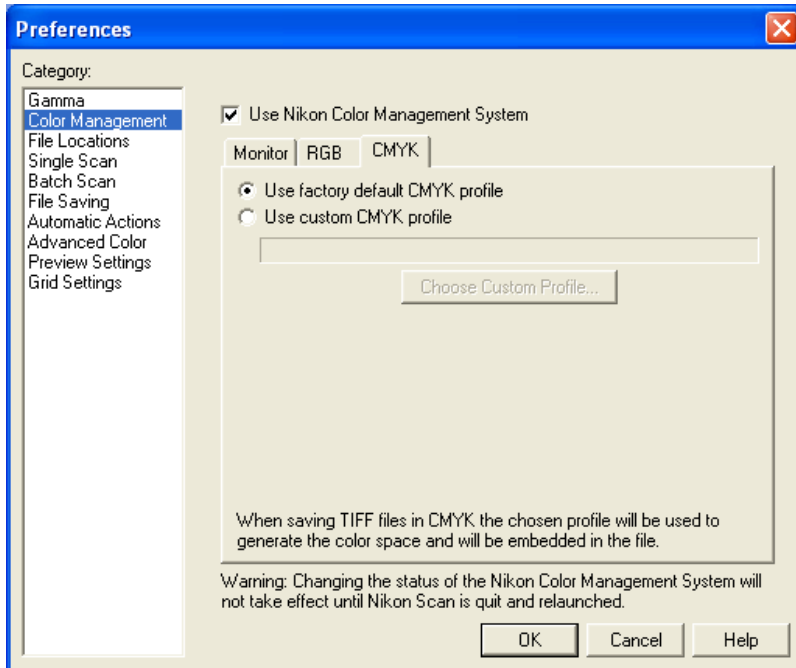
Use factory default CMYK profile (default)

Nikon Scan is supplied with a default CMYK profile (the SWOP color library) for use when no other profile is available. This profile is used when **Use factory default CMYK profile** is selected.

Use custom profile

Use this option to select a profile supplied by the company that manufactured your printer. When this option is selected, the **Choose Custom Profile…** button will be active. Clicking this button displays a standard open-file dialog; navigate to the disk and folder containing the manufacturer's profile. The path to the selected profile will appear in the text box below the **Use custom CMYK profile** radio button.

🔍 **CMYK**

Images can not be scanned in CMYK. If CMYK data are required, convert images to CMYK before saving them to disk. Note that images can only be saved in CMYK if Nikon CMS is on (Nikon CMS is on by default).

RGB Profiles Provided with Nikon Scan

Windows Profiles (Gamma 2.2)

sRGB

This RGB profile is used in the majority of Windows monitors. It closely resembles the RGB commonly used in color television, and is also used in the digital television broadcasting system that is on its way to becoming the industry standard in the United States of America. Software and hardware manufacturers use it as a default color profile and guarantee operation when it used. It is also on its way to becoming the standard for images on the web. This profile is suited to users who plan to use their digital images "as is," without editing or printing them. It however suffers from the drawback of a narrow gamut with a limited area available for reproducing blues. The corresponding RGB setting in Photoshop 5.0 is "sRGB."

Bruce RGB

This color profile attempts to expand on the ColorMatch RGB gamut by defining the chromaticity for G as lying between the values for G in the Adobe RGB and ColorMatch color-space profiles. It was proposed by Bruce Fraser, who claims that it includes most of the colors in the SWOP CMYK gamut. It is not provided in the standard install of Photoshop 5.0, but can be selected as the RGB color-space profile for Photoshop by importing the profile "NkBruce.icm".

NTSC (1953)

This is the color space for video defined by the National Television Standards Committee (NTSC) in 1953 and used in early color televisions. This color space is also used in some Far-East newspaper and printing organizations. The corresponding RGB setting in Photoshop 5.0 is "NTSC (1953)."

Adobe RGB (1988)

A color-space profile defined in Photoshop 5.0. It has a wider gamut than sRGB and includes the colors found in most CMYK gamuts, making it suitable for users involved in desktop publishing. The corresponding RGB setting in Photoshop 5.0 is "Adobe RGB (1988)."

CIE RGB

A video color-space profile established by the CIE. While it boasts a fairly wide gamut, it suffers from the drawback that the area devoted to the reproduction of cyan is relatively small. The corresponding RGB setting in Photoshop 5.0 is "CIE RGB."

Wide Gamut RGB

This color-space profile, designed by Adobe, incorporates most of the visible colors. This however has the consequence that most of the colors it can express can not be reproduced on standard monitors and printers. The corresponding RGB setting in Photoshop 5.0 is "Wide Gamut RGB."

Wide Gamut RGB (compensated)

Nikon scanners can scan some colors that cannot be expressed using the Wide Gamut RGB color-space profile. The compensated Wide Gamut RGB profile redefines Wide Gamut RGB to include all the colors that can be output from the scanner. Because many of the colors that can not be expressed in Wide Gamut RGB occur in the blue portion of the gamut, the level of detail in the blue area has been greatly increased (because the gamut has been expanded in a non-linear fashion to incorporate just those colors that could not otherwise be expressed, it can not be represented in chromaticity diagrams using a standard RGB triangle). As is the case with Wide Gamut RGB, most of the colors defined in this profile can not be reproduced on monitors and printers. It is output to the host application as Wide Gamut RGB. When scanning images into Photoshop 5.0 using this profile, set the Photoshop RGB profile to "Wide Gamut RGB."

Scanner RGB

This profile replicates the color space achieved when scanning with Nikon CMS off. Its main purpose is to allow the LCH editor and Unsharp Mask tools, which are not available when Nikon CMS is off, to be used to edit the colors produced by the scanner. In order to produce the effect achieved by turning Nikon CMS off, the monitor profile is not used, nor is an ICC profile included with the image when it is opened in the host application.

Macintosh Profiles (Gamma 1.8)

Apple RGB

This profile is used in desk-top publishing applications and in Adobe Photoshop versions 4.0 or earlier, and is the typical RGB profile for Macintosh monitors. The corresponding RGB setting in Photoshop 5.0 is "Apple RGB." This profile is suitable for working with images displayed on the Macintosh.

ColorMatch RGB

The ColorMatch profile is native to Radius PressView monitors. It has a wider gamut than Apple RGB, with a particularly wide area devoted to the reproduction of blues. The corresponding RGB setting in Photoshop 5.0 is "Color Match RGB."

Apple RGB (compensated)

This profile defines tristimulus (red, green, and blue) chromaticity as the intersection of the curve that marks the limits of the visible gamut with lines drawn from the Apple RGB white point and passing through the points that define tristimulus chromaticity in the Apple RGB color-space profile. This profile is unique in that it preserves the characteristics of Apple RGB while allowing more saturated colors. It is not provided in the standard install of Photoshop 5.0, but can be selected as the RGB color-space profile for Photoshop by importing the profile "NKApple_CPS.icm".

"Gamut"

In addition to gamma, profiles can be classified according to their *gamut*, or the range of colors that can be expressed using the profile. Gamut is conventionally expressed by means of *chromaticity*, a measure of color developed by the Commission Internationale de l'Éclairage (CIE). The CIE system, which is modeled on human color perception, maps the physical wavelengths of light to three coordinates (known as CIE X, Y, and Z) that give unique numerical expression to the full range of color differences that can be perceived by humans. Chromaticity is a measure of color from which considerations of brightness have been factored out, giving a two-coordinate system.

In the chromaticity diagram at right, the complete gamut of colors visible to humans is in the area enclosed by the green line. The curved portion of the line gives the chromaticity of "pure," unmixed colors with wavelengths in the visible spectrum of 380–780 nm. The blue end of the spectrum (380 nm) is at the bottom left corner, the red end of the spectrum (780 nm) at the bottom right corner. The straight diagonal line connecting these two points represents the different shades of purple created by combining red and blue light. The colors inside the area enclosed by these lines are created by mixing light of different wavelengths.

No color profile is capable of expressing the full range of colors visible to the human eye. The diagram below compares the gamut of colors visible to the eye with the colors that can be expressed in each of the RGB profiles provided with Nikon CMS. The gamut for each profile is contained in the triangle defined by the three points that mark the extremes of red, green, and blue for that profile (red is at the bottom right corner, green at the top of the triangle, and blue at the bottom left corner). The white point for each profile is shown by the symbol in the center of the triangle.

Legend:
- Apple RGB
- Color Match RGB
- sRGB
- NTSC (1953)
- Bruce RGB
- Adobe RGB (1988)
- CIE RGB
- Wide Gamut RGB
- Human
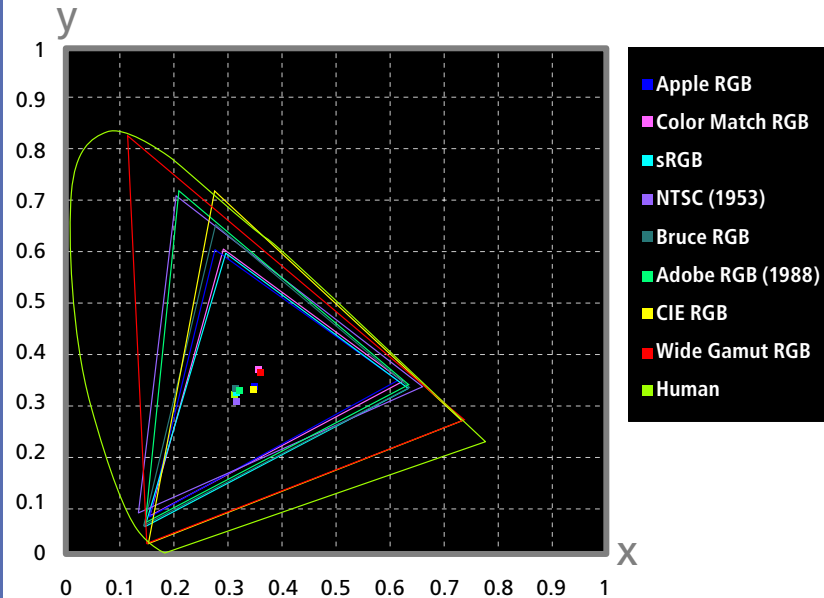
The following table shows the gamma values for the profiles included with Nikon CMS, together with the chromaticity values for the white point and for red, green, and blue.

| Profile | White Point | | Gamma Value | Chromaticity (x, y) | | | |
	Name	Value		Name	R	G	B
sRGB	6500K (D$_{65}$)	x 0.3127159	2.2	HDTV (CCIR 709)	x 0.64	x 0.3	x 0.15
		y 0.3290015			y 0.33	y 0.6	y 0.06
NTSC (1953)	Std Illuminant C	x 0.3101	2.2	NTSC (1953)	x 0.67	x 0.21	x 0.14
		y 0.3162			y 0.33	y 0.71	y 0.08
Bruce RGB	6500K (D$_{65}$)	x 0.3127159	2.2	Bruce RGB	x 0.64	x 0.28	x 0.15
		y 0.3290015			y 0.33	y 0.65	y 0.06
Adobe RGB (1988)	6500K (D$_{65}$)	x 0.3127159	2.2	Adobe RGB (1988)	x 0.64	x 0.21	x 0.15
		y 0.3290015			y 0.33	y 0.71	y 0.06
CIE RGB	Std Illuminant E	x 0.3333333	2.2	CIE RGB	x 0.735	x 0.274	x 0.167
		y 0.3333333			y 0.265	y 0.717	y 0.009
Wide Gamut RGB	5000K (D$_{50}$)	x 0.3457029	2.2	700/525/450nm	x 0.7347	x 0.1152	x 0.1566
		y 0.3585386			y 0.2653	y 0.8264	y 0.0177
Apple RGB	6500K (D$_{65}$)	x 0.3127159	1.8	Trinitron	x 0.625	x 0.28	x 0.155
		y 0.3290015			y 0.34	y 0.595	y 0.07
ColorMatch RGB	5000K (D$_{50}$)	x 0.3457029	1.8	P22-EBU	x 0.63	x 0.295	x 0.155
		y 0.3585386			y 0.34	y 0.605	y 0.077
Apple RGB (Compensated)	6500K (D$_{65}$)	x 0.3127159	1.8	Custom	x 0.65	x 0.265	x 0.14
		y 0.3290015			y 0.341	y 0.717	y 0.0454
Default Windows Monitor	6500K (D$_{65}$)	x 0.3127159	2.2	HDTV (CCIR 709)	x 0.64	x 0.3	x 0.15
		y 0.3290015			y 0.33	y 0.6	y 0.06
Default Macintosh Monitor	5000K (D$_{50}$)	x 0.34570291	1.8	Trinitron	x 0.625	x 0.28	x 0.155
		y 0.3585386			y 0.34	y 0.595	y 0.07

Keeping Colors True in Other Applications

When an image is scanned in the Nikon Scan TWAIN source or acquire plug-in and opened in another application, or when an image saved using Nikon Scan is opened in another application, the image will be processed according to the color-space and monitor profiles selected in the application before being displayed on the monitor. If the profiles used in the application do not match those used in Nikon Scan, colors may not be the same as those in the original image.

RGB Color Model
Choose a monitor profile that matches that chosen in the "Monitor" tab and a color-space profile that matches that selected in the "RGB" tab (the Photoshop profiles corresponding to those used in Nikon Scan are listed on the preceding pages). If no matching RGB profile exists, you can use the Nikon Scan profiles in the path Program Files\Common Files\Nikon\Profiles (Windows) or System Folder : Preferences : Nikon MAID : Profiles (Macintosh). The files containing the profiles listed in the RGB sheet are given below.

Profile	File name
sRGB	NKsRGB.icm
Bruce RGB	NKBruce.icm
NTSC (1953)	NKNTSC.icm
Adobe RGB (1998)	NKAdobe.icm
CIE RGB	NKCIE.icm
Wide Gamut RGB	NKWide.icm
Apple RGB	NKApple.icm
Color Match RGB	NKMatch.icm
Apple RGB (compensated)	NKApple_CPS.icm

*Do not use the "Scanner RGB" profile when scanning images for use in a third-party application.

When Nikon Scan is used as an acquire plug-in to the Macintosh version of Adobe Photoshop 5 or later (full version), the RGB profile will automatically be passed to Photoshop when the image is scanned. Be sure that the monitor profile matches that used in Photoshop by selecting the Photoshop monitor profile in the monitor sheet of the Nikon Scan color management tab.

CMYK Color Model
Choose a monitor profile that matches that chosen in the monitor sheet and a color-space profile that matches that selected in the CMYK sheet. When Nikon Scan is used as an acquire plug-in to the Macintosh version of Adobe Photoshop 5 or later (full version), the CMYK profile will automatically be passed to Photoshop when the image is scanned.

File Locations/Scratch Disks

The "File Locations" (Windows) or "Scratch Disks" (Macintosh) category is used to choose the folder or volume (disk) that will be used for temporary storage, or "virtual memory," while Nikon Scan is in operation. It is recommended that only disks with a high data transfer rate, such as hard disks, be selected for temporary storage.

Windows

The folder currently selected for temporary storage is shown under **Folder for Temporary Data**. To choose a different location, click **Change Location…** and navigate to the desired drive and folder.
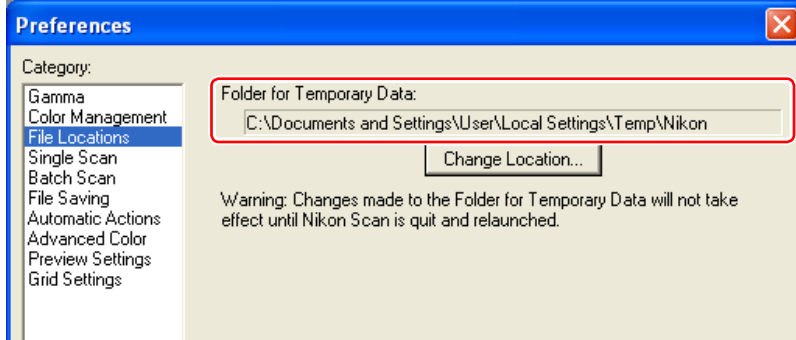
Macintosh

The volume used for temporary storage can be chosen from the **Scratch disk** menu. The amount of space available on the selected disk is shown under the menu.
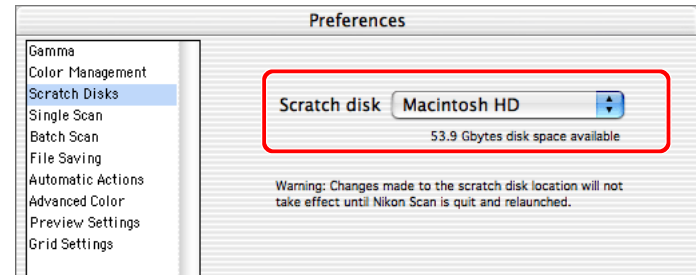
✎ **Changes to "File Locations"/"Scratch Disks" Settings**
Changes to "File Locations" and "Scratch Disks" settings only take effect after you have quit and restarted Nikon Scan.

Single Scan

The "Single Scan" category is used to specify the tasks performed automatically before and after single scans.
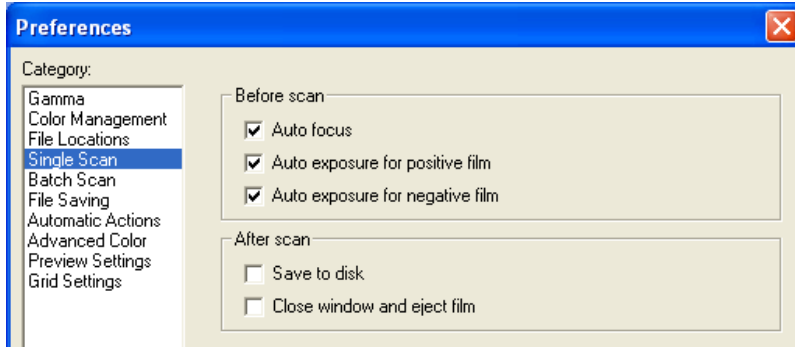
Before scan

Option	Description
Auto focus	If this item is checked (the default setting), an auto-focus operation will be performed as necessary before making a scan.
Auto exposure for positive film	If this item is checked (the default setting), an auto-exposure operation will be performed as necessary before scanning film positives.
Auto exposure for negative film	If this item is checked (the default setting), an auto-exposure operation will be performed as necessary before scanning film negatives.

After scan

Option	Description
Save to disk	If this item is checked when Nikon Scan is used as a stand-alone application, the image created when the **Scan** button is clicked will be saved to disk instead of being opened in an image window. When the **Scan** button is clicked, a "Save" dialog will appear; specify a name, location, and file type for the image. This option has no effect when Nikon Scan is being used as a plug-in or TWAIN source for another application. The default setting is off.
Close window and eject film	When this item is checked, the scan window automatically closes after scanning. Holders are automatically ejected from the 9000 ED/8000 ED, and film is automatically ejected from the SA-21, IA-20 (S), SA-30 (5000 ED/4000 ED), and SF-210/SF-200 (S) (5000 ED/4000 ED). The default setting is off.

📎 **"Before Scan"**

If **Perform auto focus when film is inserted** is selected in the "Scanner Extras" palette, an autofocus operation will automatically be performed when a slide is inserted in a slide-mount adapter (5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED) or when a holder other than the FH-869S or FH-869G is inserted in the 9000 ED or 8000 ED. As a result, an autofocus operation will not automatically be performed before the image is scanned, even if **Auto focus** is selected for "Before scan." In the case of the 9000 ED and 8000 ED, this applies only to the first frame in the holder; an autofocus operation will automatically be performed prior to scanning for all subsequent frames.

Batch Scan

The "Batch Scan" category is used to specify the tasks performed automatically before, during, and after batch scans.
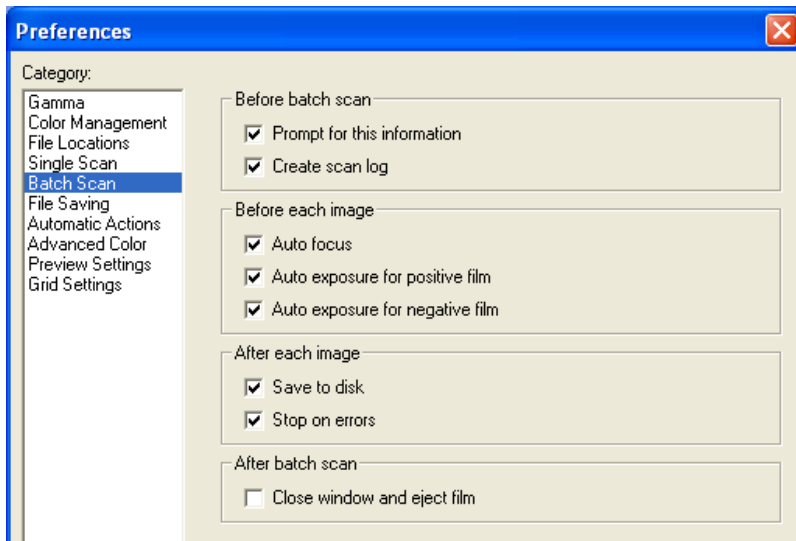
🖉 "Before Each Image"

If **Perform auto focus when film is inserted** is selected in the "Scanner Extras" palette, an autofocus operation will automatically be performed when a slide is inserted in a slide-mount adapter (5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED) or when a holder other than the FH-869S or FH-869G is inserted in the 9000 ED or 8000 ED. As a result, an autofocus operation will not automatically be performed before the image is scanned, even if **Auto focus** is selected for "Before each image." In the case of the 9000 ED and 8000 ED, this applies only to the first frame in the holder; an autofocus operation will automatically be performed prior to scanning for all subsequent frames.

Scan Settings for Batch Scans

Before batch scan

Option	Description
Prompt for this information	If this item is checked (the default setting), a dialog containing the same options as appear in the "Batch Scan" category will be displayed at the start of a batch scan.
Create scan log	If this item is checked (the default setting), a log showing the operations performed and errors that occurred during the batch scan will be displayed in the "Log" tab of the progress window. If **Save to disk** is selected for "After each image", the log will be saved to the same folder as the scanned images.

Before each image

Option	Description
Auto focus	If this item is checked (the default setting), an autofocus operation will be performed as necessary before each scan.
Auto exposure for positive film	If this item is checked (the default setting), an autoexposure operation will be performed as necessary before scanning film positives.
Auto exposure for negative film	If this item is checked (the default setting), an autoexposure operation will be performed as necessary before scanning film negatives.

After each image

Option	Description
Save to disk	If this item is checked (the default setting) when Nikon Scan is used as a "stand-alone" application, scanned images will be saved to disk instead of being opened in image windows. When the **Scan** button is clicked, a dialog will appear where the user can specify a location and file type and choose how the files will be named. This option has no effect when Nikon Scan is being used as a plug-in or TWAIN source for another application.
Stop on errors	If this item is checked (the default setting), scanning will stop when minor errors are encountered. If it is not checked, scanning will only stop when all the selected images have been scanned, film jams in the scanner, or a hardware error occurs.

After batch scan

Option	Description
Close window and eject film	When this item is checked, the scan window automatically closes after scanning. Holders are automatically ejected from the 9000 ED/8000 ED, and film is automatically ejected from the SA-21, IA-20 (S), SA-30 (5000 ED/4000 ED), and SF-210/SF-200 (S) (5000 ED/4000 ED). The default setting is off.

The "File Saving Options" Dialog

If **Save to disk** is selected in the "Batch Scan" category when Nikon Scan is used as a stand-alone application, a "File Saving Options" dialog will appear at the start of a batch scan.
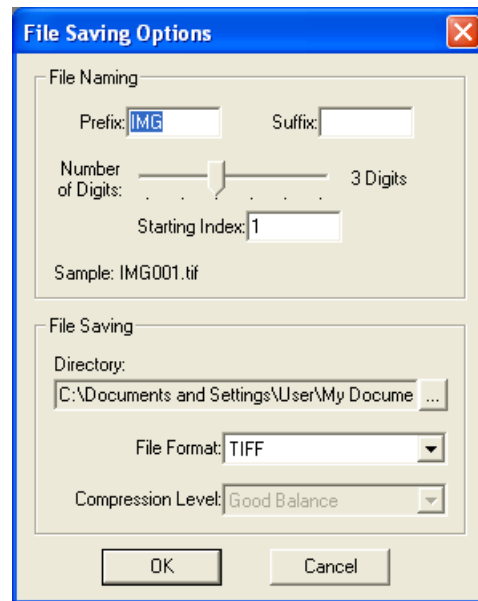
The "File Saving Options" dialog contains the following:

File Naming

Files saved during a batch scan are assigned names consisting of a prefix, a file number of from one to six digits assigned in ascending order from a user-specified starting point, and a suffix. The options in the "File Naming" area control the prefix, file number, and suffix.

Option	Description
Prefix	Enter a prefix of up to 65 characters.
Suffix	Enter a suffix of up to 65 characters.
Number of Digits	Specify the number of digits in the file number.
Starting Index	File numbers are assigned in ascending order starting from this number.
Sample	Shows a sample of the file names that will be assigned.

File Saving

Option	Description
…	To choose a destination folder for the images, click this button and navigate to the desired folder.
File Format	Select a format from NEF, TIFF, TIFF (CMYK), JPEG, BMP (Windows only), and PICT (Macintosh only).
Compression Level	If the selected file format supports compression, the amount of compression can be selected from this menu.

✐ File-Naming Conventions

Windows
Where long file names are supported, the maximum length is 255 characters. File names may not contain quotes or any of the following characters: "\\" "/" ":" "," ";" "*" "<" ">" and "|".

In environments that do not support long file names, the maximum length is eight characters; file names may not contain spaces, quotes, or any of the following characters: "\\" "/" ":" "," ";" "*" "?" "<" ">" and "|".

Macintosh
The maximum length for Macintosh file names is thirty-one characters. Colons (":") are not allowed.

File Saving

The "File Saving" category is used to choose the default file type for images saved when Nikon Scan is used as a "stand-alone" application. The Macintosh version also has an option for choosing the "creator" application, i.e., the application that will start when files saved from Nikon Scan are double-clicked.

Windows
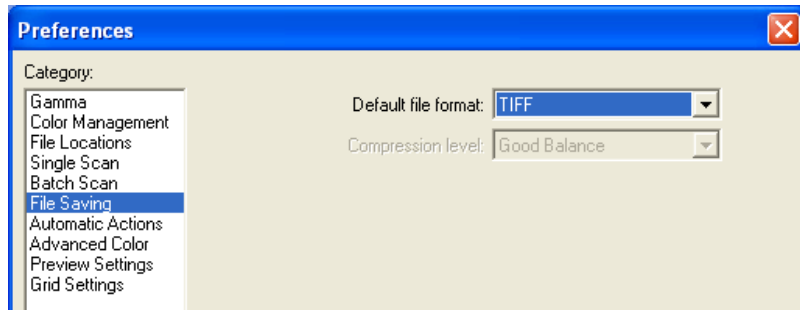
Macintosh
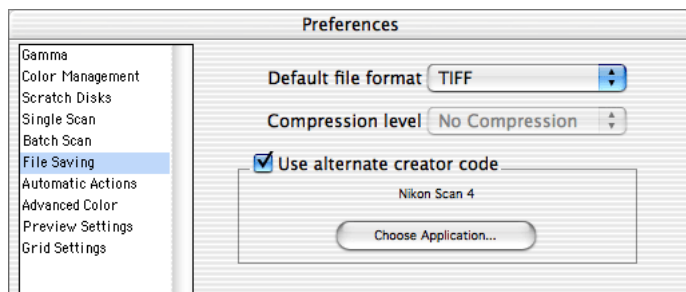
Option	Description
Default file format	Select the default file format from NEF, TIFF, TIFF (CMYK), JPEG, BMP (Windows only), and PICT (Macintosh only). Select **Last used** to choose the format most recently used to save images when Nikon Scan was used as a "stand-alone" application.
Compression level	If the selected file format supports compression, the amount of compression can be selected from this menu.
Use alternate creator code (Macintosh only)	If this option is selected, a new creator application can be chosen by clicking the **Choose Application…** button and navigating to the desired application. This option is not available in the Windows version of Nikon Scan.

Automatic Actions

The "Automatic Actions" category controls the actions performed when media are inserted in the scanner or the focus point is adjusted using the focus tool in the "Layout Tools" palette.

Option	Description
Preview when film is inserted	If **Single image adaptor** is selected, the scanner will automatically perform a preview when a slide is inserted in the MA-21/MA-20 (S) slide-mount adapter or the optional SF-210/SF-200 (S) slide feeder. If **Multiple image adaptor** is checked, the scanner will automatically perform a preview using user default settings when film is inserted in a multi-frame adapter (if no user defaults are defined, factory defaults will be used). This option is not available when the 9000 ED or 8000 ED is connected.
Thumbnail when film is inserted	If **Ten or fewer thumbnails** is selected, the scanner will automatically generate thumbnails when APS or strip film with ten or fewer frames is inserted in a multi-frame adapter. If **More than ten thumbnails** is checked, the scanner will automatically generate thumbnails when film is inserted in the SA-30 or IA-20 (S). This option is not available when the 9000 ED or 8000 ED is connected.
Perform auto focus when focus point is moved	If this option is select, the scanner will automatically perform an autofocus operation when the focus point is changed using the focus tool in the "Layout Tools" palette. If it is not checked, autofocus will only be performed when the [icon] button is clicked in the scan window control area.

Advanced Color

The "Advanced Color" category is used to specify output colors for the black, white, and gray points and to change the size of the area sampled when the eyedropper tools in the "Curves" palette are used. It is also controls the portion of the tone range excluded in auto contrast operations.
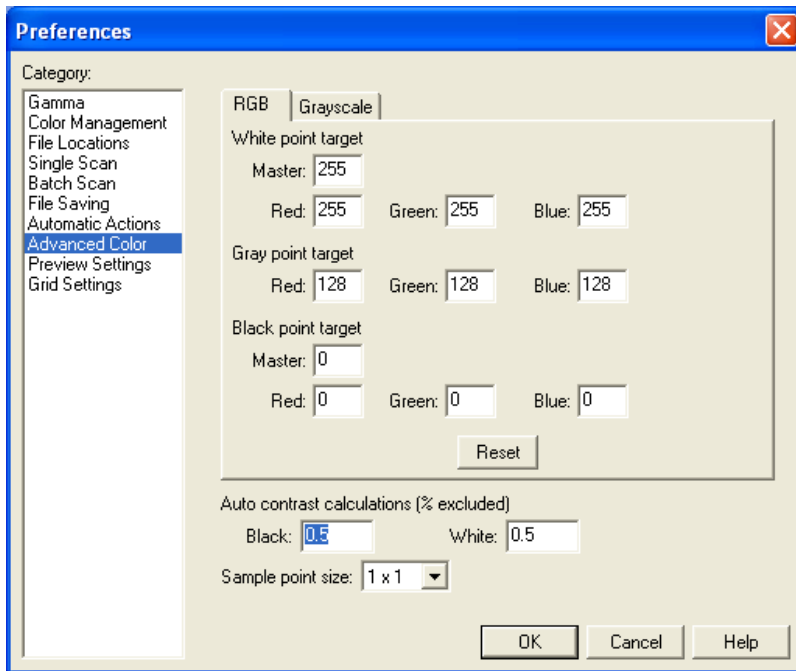
White Point, Gray Point, Black Point, and Auto Contrast

White-, Gray-, and Black-Point Targets

The targets in the "RGB" and "Grayscale" tabs specify default output values for the white, gray, and black points in each color model. The factory default setting for white point is 255 for each channel, which displays as white on most computer monitors. The factory default for the gray point is 128, which displays as a neutral gray. The default for the black point is zero, which displays as black. To restore factory defaults for the color model in the selected sheet, click **Reset**.

The Master Channel

To set the white and black points for the master channel in the RGB color model, select **RGB** in the "Curves" palette channel menu, click the white- or black-point eyedropper tool while pressing Ctrl (Windows) or option (Macintosh), and sample the image.

Output Values

Although output values in the "Advanced Color" palette range from zero to 255, calculations are performed at a precision of sixteen bits.

Auto Contrast Calculations

The **Auto contrast calculations** option controls how auto contrast operations in the "Curves" and "LCH Editor" palettes calculate the input values for the white point and black point. By default, the white point is set to a value that excludes 0.5% of the brightest pixels in the current crop, the black point to a value that excludes 0.5% of the darkest pixels in the crop. This produces an optimal dynamic range, with minimum loss of detail in shadows and highlights. To preserve detail at the expense of dynamic range, lower the "excluded" value for auto contrast (a value of zero will set the black and white point respectively to the darkest and brightest pixel in the crop). To increase the dynamic range at the expense of detail, raise the "excluded" value.

Sample Point Size

This setting determines the size of the area sampled for the color-value display and the white-point, gray-point, and black-point tools. Sample point size can be set to 1×1, 3×3, or 5×5 pixels. When the sample size is set to 3×3 or 5×5, Nikon Scan averages the pixels sampled. Choosing a large sample size reduces precision, but also minimizes the effects of noise; choosing a small sample size has the opposite effects.

✎ Digital DEE

When inspecting color values to determine the threshold for Digital DEE, set the sample point size to 5×5 pixels. Note that color values are displayed in the "Information" palette and information panel when an eyedropper tool is selected; be careful not to click the image when determining the threshold for Digital DEE. If an eyedropper cursor is selected, clicking the image could reshape the active curve.

Preview Settings

The "Preview Settings" category determines the operations performed automatically when the **Preview** button is clicked.

Option	Description
Auto focus	If this item is checked (the default setting), an auto-focus operation will be performed as necessary when the **Preview** button is clicked.
Auto exposure for positive film	If this item is checked (the default setting), an autoexposure operation will be performed as necessary before previewing film positives.
Auto exposure for negative film	If this item is checked (the default setting), an autoexposure operation will be performed as necessary before previewing film negatives.
Multi sampling	Check this item to perform multi-sample scanning during preview (9000 ED, 8000 ED, 5000 ED, 4000 ED only). Multi-sample scanning will not be performed if **Normal (1×)** is selected in the "Scanner Extras" palette. Selecting this option increases the time needed to complete a preview, while the effects of multi-sample scanning may not be visible in the preview area at the normal zoom ratio.
Digital ICE	If this item is checked (the default option), the image will be processed during preview to reduce the effects of dust and scratches. This option only takes effect if **Enable Digital ICE** is selected in the "Digital ICE⁴ Advanced" palette. Selecting this option increases the time needed to complete a preview.
Cache preview image for single image adapter	If this item is checked (the default option), Nikon Scan will store the last preview created with the MA-21/MA-20 (S) slide-mount adapter. This preview will be displayed the next time the scan window is opened or the MA-21/MA-20 (S) is inserted.

✐**Autofocus/Autoexposure**

If an autofocus or autoexposure operation has already been performed on the current frame, it will not automatically be repeated before a preview or scan. The autofocus and autoexposure buttons in the scan window can be used to perform these operations manually if desired. If **Perform auto focus when film is inserted** is selected in the "Scanner Extras" palette, an autofocus operation will automatically be performed when a slide is inserted in a slide-mount adapter (5000 ED, 4000 ED, COOLSCAN V ED, COOLSCAN IV ED) or when a holder other than the FH-869S or FH-869G is inserted in the 9000 ED or 8000 ED. As a result, an autofocus operation will not automatically be performed before the image is scanned, even if **Auto focus** is selected in the "Preview Settings" category. In the case of the 9000 ED and 8000 ED, this applies only to the first frame in the holder; an autofocus operation will automatically be performed prior to scanning for all subsequent frames.

Grid Settings

The "Grid Settings" category determines the color and spacing of the grid displayed over the image in the active window when **Show grid** is selected in the "Layout Tools" palette.
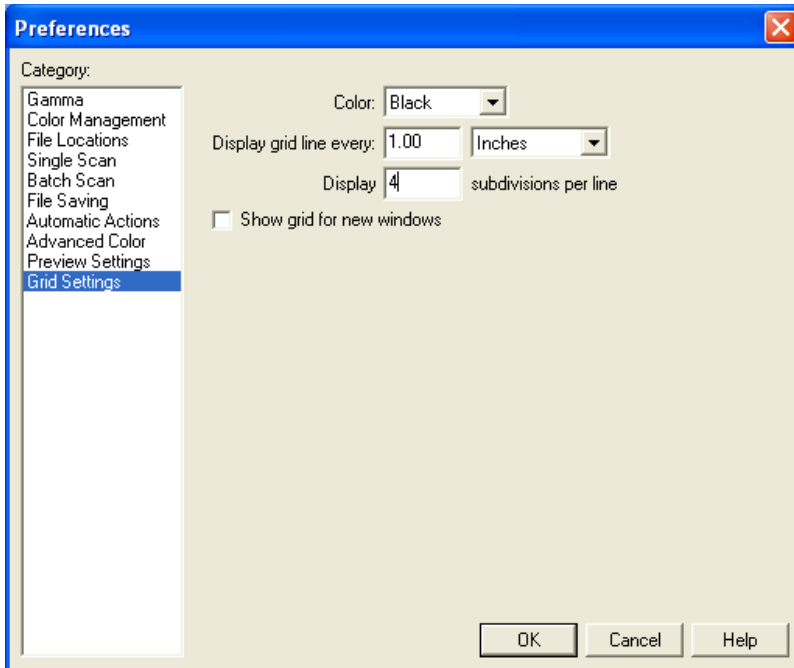
Option	Description
Color	Choose the grid color.
Display grid line every	Enter the spacing for the layout grid. Units can be selected from the menu to the right of the text box.
Display *n* subdivisions per line	Enter the number of subdivisions into which each grid cell will be divided. The main grid appears as solid lines, the subdivisions as broken lines.
Show grid for new windows	If this item is selected, a layout grid will automatically be displayed in the preview area. If Nikon Scan is used as a "stand-alone" application, a layout grid will also be displayed on images newly opened in image windows.

Image Windows

This chapter describes the operations that can be performed in image windows when Nikon Scan is used as a "stand-alone" application. Click the links for more information.

Windows   *Macintosh*
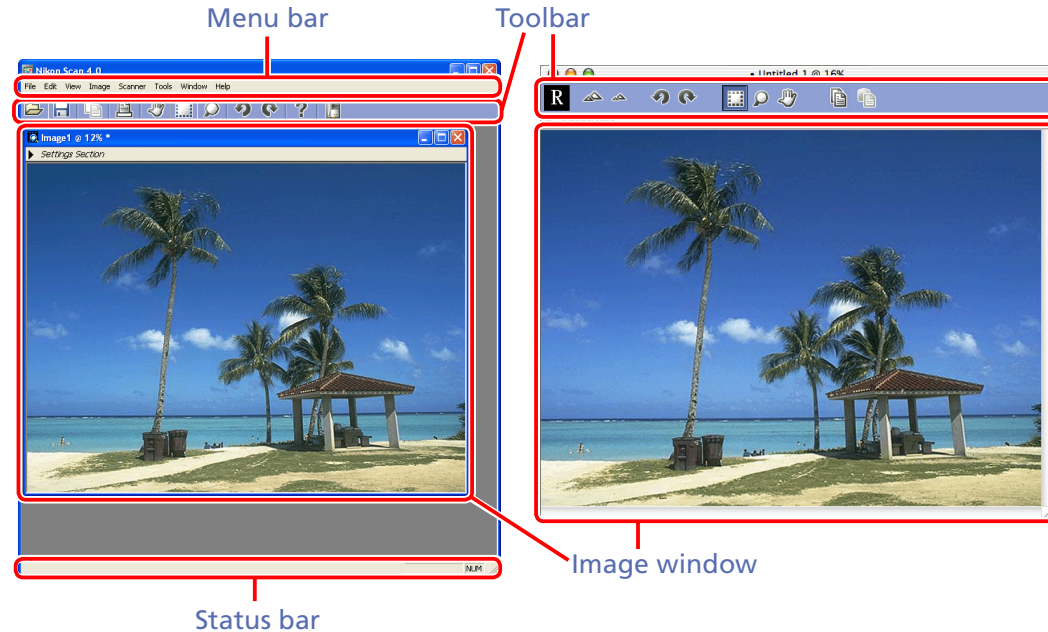
Menu bar   Toolbar

Image window

Status bar

🔘 **Third-Party Applications**

When Nikon Scan serves as a TWAIN source or acquire plug-in for a third-party imaging application such as Adobe Photoshop, images will be opened in the third-party application after scanning. See the documentation provided with the application for information on the operations that can be performed.

The Nikon Scan Applet

When Nikon Scan is used as a "stand-alone" application, images can be saved, viewed, and printed in image windows opened in the Nikon Scan applet. The Tool Chest can also be used to perform simple imaging tasks.

When Nikon Scan is used as a TWAIN source or acquire plug-in for a third-party imaging application such as Adobe Photoshop, images will not be opened in the Nikon Scan applet after scanning. Instead, they will be opened in the third-party application, where they can be viewed, edited, printed, and saved according to the options available.

Starting the Nikon Scan Applet

For information on starting the Nikon Scan applet, see **"Starting Nikon Scan as a 'Stand-Alone' Application" (⊙ 9)**. If no scanner is connected, the following message will be displayed when Nikon Scan is started:
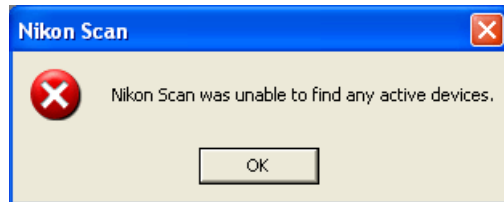
Click **OK** to close the message. To open a previously-saved image for viewing, printing, or editing, select **Open…** from the Nikon Scan **File** menu.
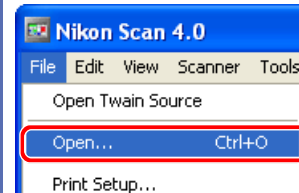
Windows   *Macintosh*
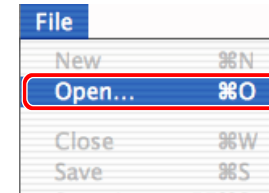
Opening Images from the Toolbar (Windows Only)
Image files can also be opened by clicking the button in the toolbar (Windows only).

Image Windows

When Nikon Scan is used as a "stand-alone" application, images are opened in image windows after scanning (except when **Save to disk** is selected in the "Preferences" dialog; 🔘 **77**) or when a file is selected using the **Open…** option in the **File** menu.

Windows
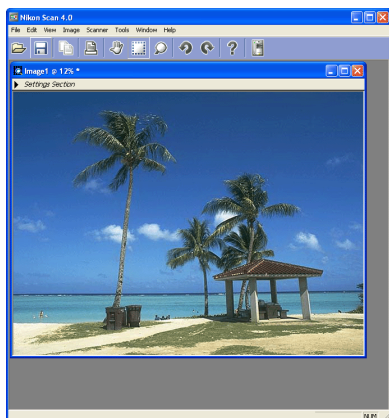
Macintosh
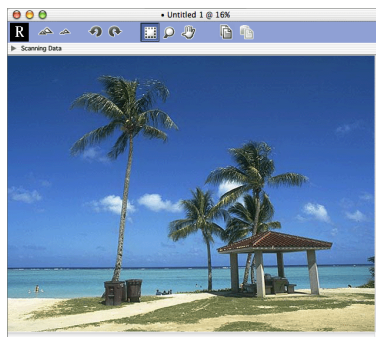
🔘 Layout Grid

If **Show grid** is selected in the "Layout Tools" palette, a layout grid will be displayed over the image in the active window. The grid can also be displayed by selecting **Show Grid** from the **View** menu.

🔘 Selecting the Active Window

When multiple windows are open in the Nikon Scan applet, a window can be activated and brought to the front by clicking the window or by choosing it from the windows listed at the bottom of the **Window** menu.

🔘 The Tool Chest

Many of the tools in the Tool Chest can be applied to images in image windows. If multiple images are opened in image windows in the Nikon Scan applet, settings can be adjusted and saved separately for each image. With the exception of images saved in NEF format, the settings in each tool palette will be reset to default values when an image is opened. When an image saved in NEF format is opened, the settings in each tool palette will be reset to the values in effect when the image was saved.

Saving Images

To save the image in the active window under a new name, choose **Save As…** from the **File** menu. A "Save As" dialog will be displayed; after navigating to the desired location, enter a file name and choose a file type. Click **Save** to save the image.

Choosing a File Type

Nikon Scan supports the following formats:

Format	Description
NEF	Changes to settings in the Tool Chest are not directly applied to images saved in NEF (**N**ikon **E**lectronic Image **F**ormat). Instead, information about settings is saved separately in the same file as the image. When the image is opened again in Nikon Scan, these settings will be loaded into the Tool Chest and applied to the image. This allows settings to be adjusted without affecting the original image (the "original image" is the image acquired from the scanner, modified according to the settings in effect in the scan window at the time image was scanned). Note that Nikon Capture does not support NEF images created in Nikon Scan.
JPEG	JPEG is a good choice for images that will be output at low resolution or distributed in electronic form. Images can be compressed, allowing more images to be saved in the same amount of disk space. Note, however, that JPEG compression results in loss of information that can not afterwards be restored. This format is not available when saving CMYK images or images with a bit depth of sixteen bits per channel.

Format	Description
TIFF	Use TIFF when saving images for high-quality output or editing. Images scanned at a bit depth of twelve or more (twelve, fourteen, or sixteen bits) will be saved as sixteen-bit TIFF, images scanned at a bit-depth of eight bits as eight-bit TIFF. Although the lack of compression will result in larger files, a high level of image quality will be maintained. TIFF is supported in a wide variety of applications on both Windows and Macintosh platforms.
TIFF (CMYK)	As above, except that the image is converted to the CMYK color model when saved. This option is available only when Nikon CMS is on (Nikon CMS is on by default).
BMP (Windows only)	Most Windows users will be able to view files of this type. This format is not available in the Macintosh version of Nikon Scan, and does not support CMYK, sixteen-bit grayscale, or sixteen-bit RGB.
PICT (Macintosh only)	PICT can be viewed on most Macintosh computers, and supports JPEG compression. This format is not available in the Windows version of Nikon Scan, and does not support CMYK, sixteen-bit grayscale, or sixteen-bit RGB.

Choosing a Compression Ratio

JPEG and PICT images can be compressed using JPEG compression, in which images are divided into blocks eight pixels on a side and detail within each block selectively reduced. Although raising the compression ratio decreases the file size, it also makes the block pattern more visible and may result in noticeable loss of detail (the actual effect depends on the output scale and the type of subject). It is recommended that files be saved at the lowest compression ratio possible; if necessary, they can always be opened and saved again at a higher compression ratio.

The compression ratio can be chosen from a menu in the "Save As" dialog. Five options are available, ranging from **Excellent Quality**, which offers the lowest compression and highest image quality, to **High Compression**, which offers the highest compression and lowest image quality.

The Settings Section

To view information about the image in an image window, click the **Settings Section** triangle or select **Settings Section** from the **View** menu.

Click to view image information

Image information hidden

Windows

Click to hide image information

Image information

Image information displayed

Macintosh

Click to hide image information

Image information

Image information displayed
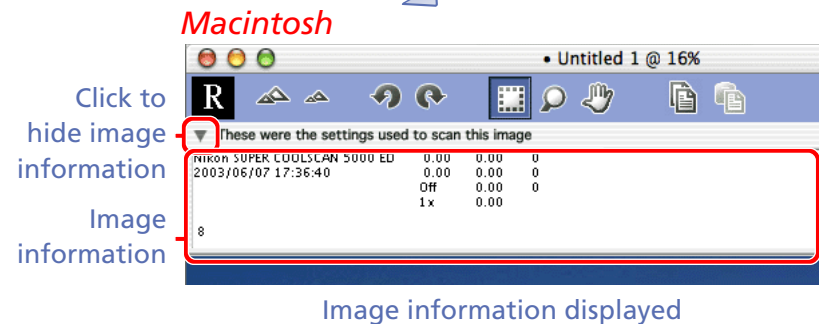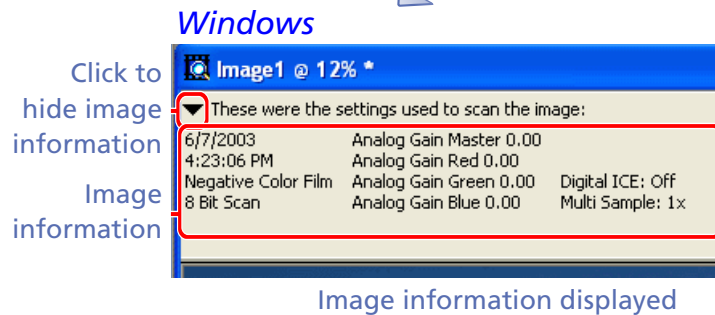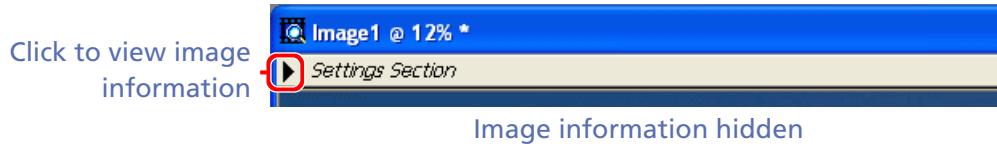
The settings section gives information about the time and date the image was created, the film type, the scan bit depth, analog gain, Digital ICE[4] Advanced, and multi-sample scanning.

Rotating and Flipping Images

Changing Image Orientation

To flip or rotate the image in the active window:

• Use the flip or rotate buttons in the "Layout Tools" palette.
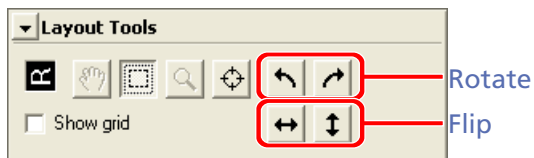
Rotate
Flip

"Layout Tools" palette

• Click the ⟳ (rotate clockwise) or ⟲ (rotate counterclockwise) buttons in the toolbar.

• Use the options in the **Image** > **Transform** sub-menu.

Zoom

Zooming Images in and Out

The active window can be zoomed in or out using the zoom cursor or the zoom options in the **View** menu.

The Zoom Cursor

To select the zoom cursor:

• click the 🔍 button in the "Layout Tools" palette,

• select **Zoom Cursor** from the **View** menu, or

• click the 🔍 button in the toolbar

Click anywhere within the image window to zoom in on the selected point. To zoom out, click the image while pressing Alt (Windows) or option (Macintosh).

The View Menu

Open the **View** menu and select **Zoom In** to zoom in on the center of the image in the active window. Select **Zoom Out** to zoom out.

To scroll the image, use the image window scroll bars or use the hand cursor to drag the image. To view the entire image at the maximum possible zoom ratio, select **Fit to Screen** from the **Window** menu. To view the image at a zoom ratio of 1 : 1, select **Actual Size** from the **Window** menu.

Color Space

Selecting a New Color Model and Bit Depth

To convert the image in the active window to a new color model and bit depth, select one of the following options from the **Image** > **Color Space** sub-menu.

Option	Description
8-bit Grayscale	Convert image to eight-bit grayscale capable of expressing 256 shades of gray.
16-bit Grayscale	Convert image to sixteen-bit grayscale capable of expressing 65,536 shades of gray.
24-bit RGB	Convert image to RGB at a bit depth of eight bits per channel (twenty-four bit RGB).
48-bit RGB	Convert image to RGB at a bit depth of sixteen bits per channel (forty-eight bit RGB).

Printing Images

Printing the Image in the Active Window

To print the image in the active window, select **Print…** from the **File** menu. In the Windows version of Nikon Scan, images can also be printed by clicking the 🖨 button in the toolbar.

✎ Converting Color Images to Grayscale

If a color image is converted to grayscale and then saved, the lost color information can not be restored.

✐ Print Preview (Windows Only)

To preview the image to be printed, select **Print Preview…** from the **File** menu (Windows only).

Editing Images

The image in the active window can be edited using the following palettes in the Tool Chest:

Palette	Operation
Layout Tools (◎ 33)	Flip, rotate, and scroll images, zoom images in or out, select an area to be copied to the clipboard, and display or hide the layout grid.
Information (◎ 35)	View information about the color of the point under the cursor and the size and location of the current selection.
Curves (◎ 41)	Adjust contrast and color balance in selected portions of the tone range (shadows, mid-tones, or highlights).
Color Balance (◎ 51)	Adjust brightness, contrast, and color balance over the entire image.
Unsharp Mask (◎ 53)	Make edges more distinct, either over the entire image or in areas where a specific color predominates.
LCH Editor (◎ 56)	Adjust brightness, color saturation, and hue.

🖊️ **Tool Palette Settings**

The settings in effect in the scan window are applied to data from the scanner when the **Scan** button is clicked. Any further changes to settings in image windows apply to these modified image data. To reflect this, tool palette settings are restored to their default values when the images are opened in image windows.

The Toolbar

The toolbar gives access to many commonly used commands with a single click. The Windows and Macintosh versions of Nikon Scan have different toolbars.

Windows

To display or hide the toolbar, select **Toolbar** from the **View** menu. When displayed, toolbar can be dragged out of the menu bar to a new position anywhere within the Nikon Scan application window, where it will "float" in an independent window.

The toolbar contains the following buttons:

Button	Description
Open	Open an image in Nikon Scan.
Save	Save the image in the active window.
Copy	Copy the current selection to the clipboard.
Print	Print the image in the active window.

Button	Description
Hand Cursor	Select the hand cursor to scroll images.
Selection Cursor	Choose the selection cursor to select an area in the active window.
Zoom Cursor	Select the zoom cursor to zoom images in and out.
Rotate 90° CCW	Rotate the image in the active window counter-clockwise.
Rotate 90° CW	Rotate the image in the active window clockwise.
Help	Open Nikon Scan help.
Open Twain source	Open the scan window.

Macintosh

In the Macintosh version of Nikon Scan, each image window has its own toolbar.

The toolbar contains the following buttons:

Button	Description
R Image Orientation	Shows the orientation of the image, reflecting any flips or rotations.
Zoom In	Zoom the image in.
Zoom Out	Zoom the image out.
Rotate 90° CCW	Rotate the image counterclockwise.
Rotate 90° CW	Rotate the image clockwise.

Button	Description
Selection Cursor	Choose the selection cursor to select an area in the window.
Zoom Cursor	Select the zoom cursor to the zoom image in and out.
Hand Cursor	Select the hand cursor to scroll the image.
Copy Settings	Display a dialog where selected Tool Chest settings can be copied to the clipboard.
Paste settings	Paste settings copied with the button into the Tool Chest for the current image.

The Status Bar (Windows Only)

When the cursor is moved over a button or menu, a brief description of its function appears in the status bar at the bottom of the application window.
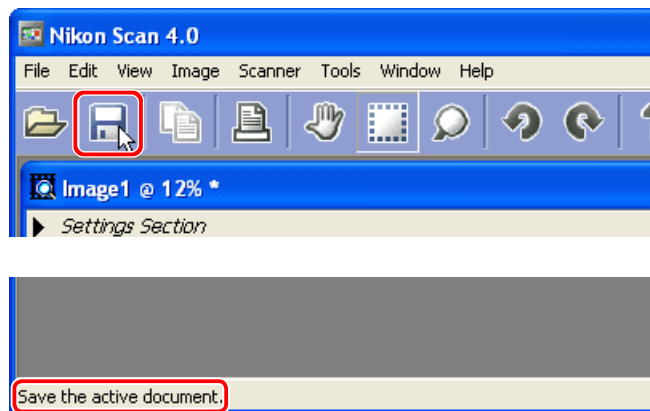
Status bar display for the "Save" button

The status bar can be hidden or displayed by selecting **Status Bar** from the **View** menu.
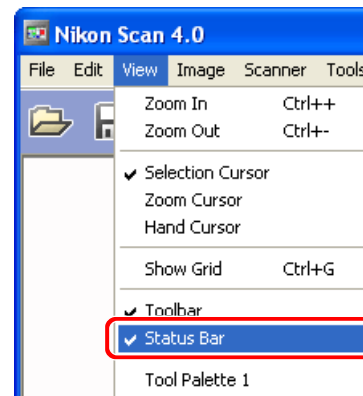
Menu Commands

Windows

File

Open Twain Source

Open Twain Source
Open the scan window.

Open…
Open an image file.

Close
Close the active window.

Save
Save the image in the active window.

Save As…
Save the image in the active window under a new name.

Print…
Print the image in the active window.

Print Preview
Preview the image to be printed.

Print Setup…
Adjust printer settings.

Recent files
Recent files are listed in the order opened. Choose a file to open it in an image window.

Exit
Exit Nikon Scan.

Edit

Edit

Undo
Undo the preceding operation.

Cut
The Ctrl-X shortcut can be used in dialogs to cut selected text to the clipboard. The menu command itself can not be used.

Copy
The Ctrl-C shortcut can be used in dialogs to copy selected text to the clipboard. The menu command itself can not be used.

Copy Settings…
Copy to the clipboard selected Tool Chest settings for the image in the active window. A dialog will be displayed where the desired settings can be selected.

Copy All Settings
Copy to the clipboard all Tool Chest settings for the image in the active window.
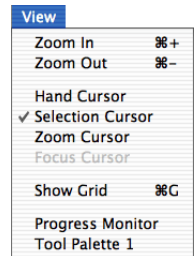
Paste
Paste the contents of the clipboard to the Tool Chest. The Ctrl-V shortcut can be used to paste text in a dialog.

Clear
Delete the contents of the current text box.

Preferences…
Display the "Preferences" dialog.

View

Zoom In
Ctrl++
Zoom Out
Ctrl+-

Zoom In
Zoom in on the image in the active window.

Zoom Out
Zoom out from the image in the active window.

Selection Cursor
Select the crop cursor.

Zoom Cursor
Select the zoom cursor.

Hand Cursor
Select the hand cursor.

Show Grid
Display or hide the layout grid in the active window.

Toolbar
Display or hide the toolbar.

Status Bar
Display or hide the status bar.

Tool palettes
A list of Tool Chests is displayed in the **View** menu. Select to display or hide Tool Chests.

Progress Window
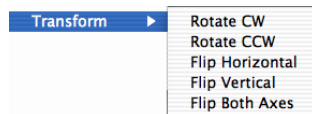Select to display or hide the progress window.
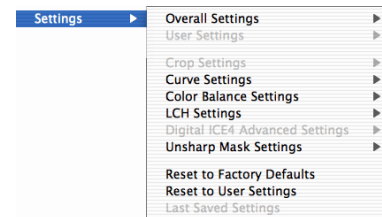
Image

Color Space
Convert the image in the active window to a new color space and bit depth.

Transform
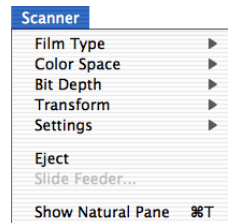Rotate or flip the image in the active window.

Settings
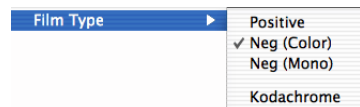Copy, save, load, delete, or reset settings for all tool palettes or for selected tool palettes.

Settings Section
Display the settings section for the active window.

Scanner *(displayed only when scan window is active)*
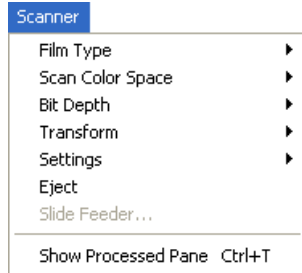
Film Type

Select type of film to be scanned.
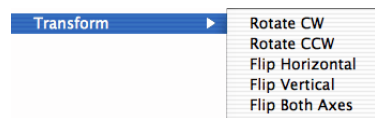
Scan Color Space

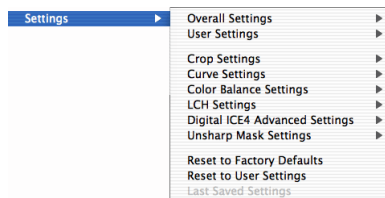Choose the scan color model.

Bit Depth

Choose the scan bit depth.

Transform

Rotate or flip the image in the preview area.

Settings

Copy, save, load, delete, or reset settings for all tool palettes or for selected tool palettes.

Eject

Eject the film or holder from the scanner.

Slide Feeder…

Choose the number of slides scanned when a slide feeder is inserted in the scanner.

Show Natural Pane / Show Processed Pane

Switch between the "Natural" and "Processed" panels in the preview area.

Tools

Show Nikon Browser

Open the Nikon Browser component of Nikon View.

Scanner/Firmware Version/Port

Open the scan window for the selected scanner.

Window

Fit To Screen

Resize the active window to fit the screen.

Actual Size

View image in active window at 100%.

Cascade

Arranges image windows so that they overlap.

Window *(continued)*

Tile

Arranges image windows so that they do not overlap.

Arrange Icons

Arranges minimized image windows along the bottom of the Nikon Scan application window.

Open windows

A list of the images currently open is displayed at the end of the **Window** menu.
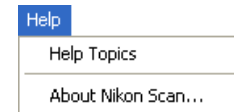
Help

Help Topics

Open Nikon Scan help.

About Nikon Scan…

Display version information for Nikon Scan.

Macintosh (Mac OS X)

Application menu
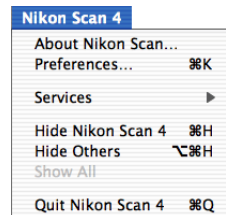
About Nikon Scan…
Display version information for Nikon Scan.

Preferences…
Display the "Preferences" dialog.

Quit Nikon Scan 4
Quit Nikon Scan.

File

New
This command can not be used.
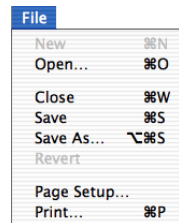
Open…
Open an image file.

File *(continued)*

Close
Close the active window.

Save
Save the image in the active window.

Save As…
Save the image in the active window under a new name.

Revert
This command can not be used.

Page Setup…
Adjust printer settings.

Print…
Print the image in the active window.

Edit

Undo
Undo the preceding operation.

Cut
When entering text in a dialog, cut selected text and place it in the clipboard.

Copy
When entering text in a dialog, cut selected text to the clipboard.

Copy Settings…
Copy to the clipboard selected Tool Chest settings for the image in the active window. A dialog will be displayed where the desired settings can be selected.

Copy All Settings
Copy to the clipboard all Tool Chest settings for the image in the active window.

Paste
Paste the contents of the clipboard.

Clear
When entering text in a dialog, clear the contents of the current text box.

Select All
When entering text in a dialog, select all the text in the current text box. When the scan window is active, select all thumbnails in the thumbnail drawer.

Macintosh (Mac OS X)

View

Zoom In
Zoom in on the image in the active window.

Zoom Out
Zoom out from the image in the active window.

Hand Cursor
Select the hand cursor.

Selection Cursor
Select the crop cursor.

Zoom Cursor
Select the zoom cursor.

Focus Cursor
Select the cursor used to choose the focus point.

Show Grid
Display or hide the layout grid in the active window.

Progress Monitor
Display the progress window.

Tool palettes
A list of Tool Chests is displayed at the end of the **View** menu. Select to display or hide Tool Chests.

Image

Color Space
Convert the image in the active window to a new color space and bit depth.

Transform
Rotate or flip the image in the active window.

Settings
Copy, save, load, delete, or reset settings for all tool palettes or for selected tool palettes.

Settings Section
Display the settings section for the active window.

Macintosh (Mac OS X)

Scanner *(displayed only when scan window is active)*

Film Type

Select type of film to be scanned.

Color Space

Choose the scan color model.

Bit Depth

Choose the scan bit depth.

Transform

Rotate or flip the image in the preview area.

Settings

Copy, save, load, delete, or reset settings for all tool palettes or for selected tool palettes.

Eject

Eject the film or holder from the scanner.

Slide Feeder…

Choose the number of slides scanned when a slide feeder is inserted in the scanner.

Show Natural Pane / Show Processed Pane

Switch between the "Natural" and "Processed" panels in the preview area.

Tools

Show Nikon Browser

Open the Nikon Browser component of Nikon View.

Scanner/Firmware Version/Port

Open the scan window for the selected scanner.

Window *(displayed only when image window is active)*

Fit To Screen

Resize the active window to fit the screen.

Actual Size

View image in active window at 100%.

Open windows

A list of the images currently open is displayed at the end of the **Window** menu.

Help

Nikon Scan Help

Open Nikon Scan help.

Macintosh (Mac OS 9)

Apple menu

About Nikon Scan…
Display version information for Nikon Scan.

File

New
This command can not be used.

Open…
Open an image file.

Close
Close the active window.

Save
Save the image in the active window.

File *(continued)*

Save As…
Save the image in the active window under a new name.

Revert
This command can not be used.

Page Setup…
Adjust printer settings.

Print…
Print the image in the active window.

Quit
Quit Nikon Scan.

Edit

Undo
Undo the preceding operation.

Cut
When entering text in a dialog, cut selected text and place it in the clipboard.

Copy
When entering text in a dialog, cut selected text to the clipboard.

Copy Settings…
Copy to the clipboard selected Tool Chest settings for the image in the active window. A dialog will be displayed where the desired settings can be selected.

Copy All Settings
Copy to the clipboard all Tool Chest settings for the image in the active window.

Paste
Paste the contents of the clipboard.

Clear
When entering text in a dialog, clear the contents of the current text box.

Select All
When entering text in a dialog, select all the text in the current text box. When the scan window is active, select all thumbnails in the thumbnail drawer.

Preferences…
Display the "Preferences" dialog.

Macintosh (Mac OS 9)

View

Zoom In
Zoom in on the image in the active window.

Zoom Out
Zoom out from the image in the active window.

Hand Cursor
Select the hand cursor.

Selection Cursor
Select the crop cursor.

Zoom Cursor
Select the zoom cursor.

Focus Cursor
Select the cursor used to choose the focus point.

Show Grid
Display or hide the layout grid in the active window.

Progress Monitor
Display the progress window.

Tool palettes
A list of Tool Chests is displayed at the end of the **View** menu. Select to display or hide Tool Chests.

Image

Color Space

Convert the image in the active window to a new color space and bit depth.

Transform

Rotate or flip the image in the active window.

Settings

Copy, save, load, delete, or reset settings for all tool palettes or for selected tool palettes.

Settings Section
Display the settings section for the active window.

Macintosh (Mac OS 9)

Scanner *(displayed only when scan window is active)*

Film Type

Select type of film to be scanned.

Color Space

Choose the scan color model.

Bit Depth

Choose the scan bit depth.

Transform

Rotate or flip the image in the preview area.

Settings

Copy, save, load, delete, or reset settings for all tool palettes or for selected tool palettes.
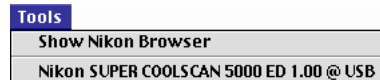
Eject

Eject the film or holder from the scanner.

Slide Feeder

Choose the number of slides scanned when a slide feeder is inserted in the scanner.

Show Natural Pane/ Show Processed Pane

Switch between the "Natural" and "Processed" panels in the preview area.

Tools

Show Nikon Browser

Open the Nikon Browser compo-nent of Nikon View.

Scanner/Firmware Version/Port

Open the scan window for the selected scanner.

Window *(displayed only when image window is active)*

Fit to Screen

Resize the active window to fit the screen.

Actual Size

View image in active window at 100%.

Open windows

A list of the images currently open is displayed at the end of the **Win-dow** menu.

Help

Nikon Scan Help

Open Nikon Scan help.

Selecting **Show Nikon Browser** in the Nikon Scan **Tools** menu opens the Nikon Browser component of Nikon View, where image files that have been saved to disk can be browsed, and selected images viewed, edited, and printed. For more information, see the *Nikon View Reference Manual* or Nikon View's on-line help.
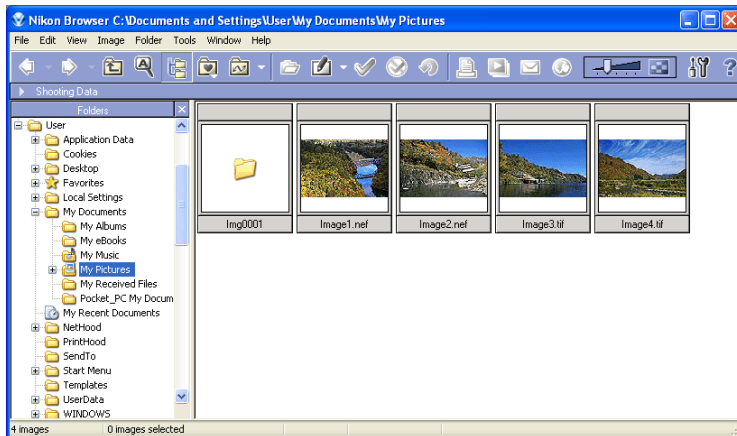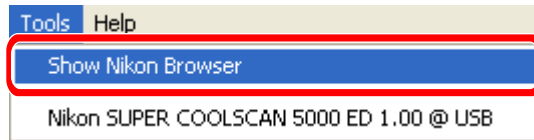
The **Show Nikon Browser** option can only be used if Nikon View 6 has been installed from the supplied Nikon View 6 CD. If an earlier version of Nikon View is already installed on the computer, upgrade to Nikon View 6.

Browsing Images Created with Nikon Scan

Some functions are not available when browsing images created with Nikon Scan. Nikon View does not support BMP (Windows) or PICT (Macintosh). Save files in TIFF or JPEG when using Nikon View. Large files created with Nikon Scan may not display in slide shows.

Color Management

For accurate color reproduction, choose the same color-space profile in Nikon Scan and Nikon View.

Product Registration

Nikon View 6 or later can be registered on-line. See the *Nikon View Reference Manual* for more information.

Scan Index

This section lists common scanning operations. Click the links to view related sections of this manual.

Common Tasks

Operation	👁
Open the scan window	**Starting Nikon Scan (◎ 8)**
Specify the film type	**The Film Type Menu (◎ 19)**
Choose a color model	**The Color Model Menu (◎ 20)**
Choose a frame size (9000 ED/8000 ED only)	**The Frame Size Menu (◎ 20)**
Select frames for scanning	**The Thumbnail Drawer (◎ 23)**
Preview images before scanning	**The Preview Button (◎ 26)** **The Preview Area (◎ 27)**
Scan images	**The Scan Button (◎ 28)**
Save images after scanning	**Image Windows—Saving Images (◎ 109)**
Rotate images	**Layout Tools (◎ 33)**
Zoom images in and out	**Layout Tools (◎ 33)** **The Scan Window—The Zoom Buttons (◎ 16)** **Image Windows—Zoom (◎ 112)**
Select the area to be scanned (select a crop)	**Layout Tools (◎ 33)**
View information about a selection	**Information (◎ 35)**
Focus the scanner	**The Autofocus Button (◎ 15)**
Adjust exposure	**The Autoexposure Button (◎ 16)**

Image Size and Resolution

Operation	👁
Set image size and output resolution	**Crop (👁 36)**

Image Enhancement

Operation	👁
Automatically adjust brightness and saturation to produce a high-contrast image	**Scan Image Enhancer (👁 70)**
Reduce the effects of dust and scratches	**Digital ICE[4] Advanced—Digital ICE (👁 62)**
Restore colors lost through fading	**Digital ICE[4] Advanced—Digital ROC (👁 63)**
Reduce the effects of film grain	**Digital ICE[4] Advanced—Digital GEM (👁 64)**
Reveal details in highlights and shadows	**Digital ICE[4] Advanced—Digital DEE (👁 65)**
Adjust contrast in highlights, mid-tones, or shadows	**Curves (👁 41)**
Adjust color balance in highlights, mid-tones, or shadows	**Curves (👁 41)**
Adjust brightness, contrast, and color balance over the entire tone range	**Color Balance (👁 51)**
Sharpen edges	**Unsharp Mask (👁 53)**
Adjust brightness, color saturation, and hue	**LCH Editor (👁 56)**
Adjust color balance by selectively adjusting exposure during scanning	**Analog Gain (👁 69)**
Choose a scan bit depth (pixel data size)	**Scanner Extras—Pixel Data Size (👁 75)**
Reposition thumbnails	**Scanner Extras—Strip Film Offset (👁 73)**
Adjust scanner settings	**Scanner Extras (👁 71)**
Reduce noise (9000 ED, 8000 ED, 5000 ED, 4000 ED only)	**Scanner Extras—Multi-Sample Scanning (👁 76)**

Batch Scanning, Automatic Processing, and Scan Window Settings

Operation	👁
Reuse scan window settings	**The Settings Menu (👁 17)**
Specify actions performed before and after a single image is scanned	**Preferences—Single Scan (👁 95)**
Specify actions performed before, during, and after a batch scan	**Preferences—Batch Scan (👁 96)**
Choose a default file format	**Preferences—File Saving (👁 99)**
Specify actions performed when film is inserted	**Preferences—Automatic Actions (👁 100)**
Specify actions performed when an image is previewed	**Preferences—Preview Settings (👁 103)**
Choose the number of slides in a batch scan (SF-210/SF-200 (S))	**Batch Scans (👁 29)** **Scanner Extras—Slide Feeder Scan (👁 76)**

Miscellaneous

Operation	👁
Adjust output for display on the current computer monitor	**Preferences—Gamma (👁 82)**
Choose a color profile for accurate color reproduction	**Preferences—Color Management (👁 84)**
Choose where Nikon Scan stores temporary files	**Preferences—File Locations/Scratch Disks (👁 94)**
Set target output levels for the white point, gray point, and black point	**Preferences—Advanced Color (👁 101)**
Choose a color and spacing for the layout grid	**Preferences—Grid Settings (👁 105)**
Ensure that colors are reproduced accurately on the monitor, between applications, and on different output devices	**Preferences—Nikon Color Management (👁 78)** **Preferences—Gamma (👁 82)** **Preferences—Color Management (👁 84)**

Appendices

Troubleshooting, Glossary, and Memory Requirements

If any problems are encountered with Nikon Scan, check the list below before contacting a Nikon representative.

Problem	Possible Cause	👁
Nikon Scan displays the error, "Nikon Scan was unable to find any active devices."	• The scanner is turned off or not connected. Connect the scanner as described in the scanner *User's Manual*.	—
	• The USB or IEEE 1394 (Firewire) interface is not correctly installed, or the device drivers are missing or corrupted. See the manufacturer's manual for details.	—
	• The scanner device drivers are not correctly installed (Windows only). See the scanner hardware manual for details.	—
	• Your computer does not meet the specifications given in the system requirements.	🔘 4
	• Nikon Scan is not correctly installed. Reinstall Nikon Scan as described in the scanner *User's Manual*.	—
The host application does not recognize the Nikon Scan plug-in (Macintosh).	• The plug-in has not been copied to the application's plug-ins folder.	—
	• The application does not support Adobe Photoshop plug-ins. Use a different host application.	—
Film jams in the scanner.	See the scanner *User's Manual* for information on resolving jams.	—
Images are out of focus.	• An autofocus operation was not performed before the image was scanned.	🔘 15
	• The focus point requires adjustment.	🔘 15
Colors do not match the original.	• The monitor profile chosen in the "Color Management" category of the "Preferences" dialog does not match the monitor.	🔘 85
	• The CMYK profile chosen in the "Color Management" category of the "Preferences" dialog does not match the printer.	🔘 87
	• The RGB color-space profile chosen in the "Color Management" category of the "Preferences" dialog has too narrow a gamut (colors too vivid) or too wide a gamut (image lacks contrast).	🔘 86
	• Curves (🔘 41), color balance (🔘 51), or LCH (🔘 56) settings are incorrectly adjusted.	—
	• Negative film was scanned without an autoexposure operation.	🔘 16
	• Monitor settings require adjustment.	—

Problem	Possible Cause	👁
Images are too dark.	• The monitor profile chosen in the "Color Management" category of the "Preferences" dialog does not match your monitor.	◉ **85**
	• The CMYK profile chosen in the "Color Management" category of the "Preferences" dialog does not match the printer.	◉ **87**
	• The RGB color-space profile chosen in the "Color Management" category of the "Preferences" dialog has the wrong gamma value for your platform.	◉ **86**
	• You need to adjust the gamma value chosen in the "Gamma" category of the "Preferences" dialog for use when Nikon CMS is off.	◉ **82**
	• The brightness setting on your monitor requires adjustment.	—
The scanned image has a rough, jagged appearance.	• The resolution setting in the "Crop" palette does not suit the output device.	◉ **36**
	• The halo width or intensity settings in the "Unsharp Mask" palette are too high.	◉ **53**
File size is too large.	The value for resolution in the "Crop" palette is too high.	◉ **36**
Print size is too large or too small.	"Crop" palette settings are not adjusted correctly.	◉ **36**

Appendix B

This glossary provides definitions of some of the terms used in this manual.

Term	Definition
Bit depth	The number of bits used to express color, also referred to as color depth. The bit depth determines the amount of color information in an image. The greater the bit depth, the larger the number of colors, and the finer the gradations, that can be expressed. Bit depth can be used to refer both to the number of bits per channel and to the combined bit depth for all channels; thus, for example, an image with a bit depth of eight bits per channel can be said to have a bit depth of twenty-four bits. An image with a bit depth of one bit has only two colors, typically black and white, with no gradation between the two. *See also* **Channel**.
Black point	The input value below which all input tones are mapped to the minimum output value (by default no color, or black). Any details darker than the black point will be lost. *See also* **Tone**, **Tone curve**.
Channel	The component colors in a given color space. The RGB color space is made up of red, green, and blue channels and a master channel that combines the three. *See also* **Color space**.
CMS	*See* **Color management system**.
CMYK	A reflective (subtractive) color model commonly used in printing, which models color using combinations of the three secondary colors used in printer's ink, **C**yan, **M**agenta and **Y**ellow. Because no combination of these three inks will create a true black, blac**K** ink is also used.
Color management system	A method of ensuring consistency of color reproduction between devices such as scanners, monitors, and printers, and between different computer platforms. In the color management system used in Nikon Capture 3, accurate color reproduction is ensured through the use of profiles that provide information about the characteristics of the monitor or printer and the color space used for editing. *See also* **ICC**, **Profile**.
Color space	A general term encompassing both the model used to define color (for example, CMYK or RGB) and the range, or gamut, of colors that can be expressed in a given color model. *See also* **CMYK**, **Gamut**, **RGB**.
Compression	A method for reducing file sizes for storage or transmission. Compression algorithms can be divided into "lossless" algorithms, such as LZW, in which no information is lost when files are restored to their original size for display or editing, and "lossy" algorithms, such as JPEG, in which some information is lost when the file is restored. *See also* **JPEG**, **TIFF**.

Term	Definition
Crop	The selected portion of an image.
Curve	*See* **Tone Curve**.
dpi	dots per inch, a measure of resolution. The more dots per inch, the higher the resolution. *See also* **ppi**, **Resolution**.
Firewire	Apple's term for the IEEE 1394 interface. *See* **IEEE 1394**.
Gamma	Gamma (also written "γ"), a fundamental property of video systems, determines the intensity of the output signal relative to the input. When calculating gamma, the maximum possible input intensity is assigned a value of one, and the minimum possible intensity (no input) is assigned a value of zero. Output is calculated by raising input to the inverse of the gamma value (output = input (1/γ)).
Gamut	The range of colors that can be expressed by a given input device (for example, scanner or digital camera), output device (monitor or printer), or color profile. No gamut can reproduce all of the colors seen by the human eye. The gamut of primary RGB (Red, Green, and Blue) transmitted light displays (film transparencies and color monitors) is very different from, and complementary to, the gamut of secondary CMYK (Cyan, Magenta, Yellow, and blacK) reflected light displays (printed materials). *See also* **CMYK**, **Profile**, **RGB**.
Gray point	Controls the output level for mid-tones in the original image. *See also* **Tone**, **Tone curve**.
Grayscale	A color model reproduces image data in shades of gray. Eight-bit grayscale supports 256 shades, sixteen-bit grayscale 65,526 shades. *See also* **Bit depth**.
Halo width	The extent of pixels around a selected central pixel affected when Unsharp Mask is applied. Also referred to as "radius." Increasing the halo width increases the width of edges affected by Unsharp Mask. Excessive application of Unsharp Mask results in an undesirable halo along edges in the image. *See also* **Unsharp Mask**.
Histogram	A bar graph showing the distribution of tones or chroma in an image. The horizontal axis shows tone level (brightness) or chroma, the vertical axis the number of pixels. The bars in the graph show the number of pixels of a given brightness or chroma in the image. The histograms displayed in the "Curves" and "LCH Editor" palettes shows the distribution for the selected channel, and can be used for reference when editing curves. *See also* **Tone**, **Tone curve**.
ICC	The International Color Consortium, an international organization working to develop standards for color management and color management profiles. ICC profiles were developed for the conversion of color space information between devices, and are now on their way to becoming a global standard. ICC profiles have been proposed as an International Organization for Standardization (ISO) standard. *See also* **Profile**.

Term	Definition
IEEE 1394	A high-speed transfer protocol developed by the Institute of Electrical and Electronics Engineers for connecting peripherals such as hard disks, MO drives, and digital cameras to a computer via a cable.
JPEG	A standard graphic format designed by the **J**oint **P**hotographic **E**xperts **G**roup. Images are compressed using a discrete cosine transform that takes advantage of the properties of human vision, which is more sensitive to light in the lower wavelengths, to increase quantization at lower frequencies. JPEG compression is "lossy," meaning that information is lost when images are compressed, leading to a drop in image quality. A lossless compression option is also supported in some implementations. JPEG images can be compressed to as much as 100:1, though quality will be significantly reduced. At a compression ratio of 20 : 1, image quality is not noticeably diminished.
NEF	**N**ikon **E**lectronic Image **F**ormat, an image file format developed by Nikon to support high-resolution image data. In Windows, NEF files have the extension ".nef". The advantage of NEF is that while user settings such as curves and color balance are saved, they are not applied to the original image data. NEF images may thus be edited and saved several times without degrading or altering the original image.
Noise	Digital "artifacts," or data in an image file that are not a part of the original image. The presence of noise is reflected in a loss in image quality.
Plug-in	A software module that adds functionality to another application.
ppcm	**p**ixels **p**er **c**enti**m**eter, a measure of resolution. The more pixels per centimeter, the higher the resolution. *See also* **ppi**, **Resolution**.
ppi	**p**ixels **p**er **i**nch, a measure of resolution. The more pixels per inch, the higher the resolution. *See also* **ppcm**, **Resolution**.
Preferences	Settings controlling basic operations performed by a given program, adjustable by the user.
Profile	A file defining the color characteristics of an input device such as a scanner or digital camera, an output device such as a printer or monitor, or the color space used for editing images. Profiles are used by color management systems to ensure consistent color reproduction. The Nikon Color Management System used in Nikon Scan employs ICC profiles. *See also* **Color space**, **ICC**.
Resolution	The density of dots or pixels that make up an image, measured in dots per inch (dpi) or pixels per inch (ppi); the resolution of Windows monitors, for example, is 96 ppi. The greater the density of dots or pixels, the higher the resolution and the greater the capacity to express detail. Resolution is hence the digital equivalent of film resolving power. Computer monitors typically have a resolution of 72 ppi, 90 ppi, or 96 ppi, while printers may have resolutions of 300 dpi, 600 dpi, 1200 dpi, or 2400 dpi. *See also* **ppcm**, **ppi**.

Term	Definition
RGB	An additive color model commonly used in monitors, in which light emitted in three primary colors, **R**ed, **G**reen and **B**lue, is combined to create a wide variety of colors. White is modeled by mixing 100% of all three colors.
Scale	The output size of an image as a percentage of the input size. At a scale of 50%, images are output at half their original size.
Threshold	The limit up to which Unsharp Mask will be applied. While it is generally the case that the higher the threshold, the greater the amount of sharpening applied, the exact effect depends on other Unsharp Mask settings, such as halo width. *See also* **Halo width**, **Unsharp Mask**.
Thumbnail	A small preview image, the digital equivalent of a photographic film contact sheet. If the current adapter can read multiple frames, thumbnails will be displayed in the scan windows thumbnail drawer.
TIFF	**T**agged **I**mage **F**ile **F**ormat, an image file format for color or grayscale images, suited to storing bit-mapped images such as digital photographs. In some implementations, TIFF supports "lossless" LZW and packbit compression (in "lossless" compression methods, no information is lost when the image is compressed, as opposed to "lossy" compression methods such as JPEG, in which detail is sacrificed to achieve higher compression ratios). Images saved in TIFF format using Nikon Scan are not compressed. *See also* **Compression**, **JPEG**.
Tone	Pixel brightness, measured either as the combined intensity for red, green, and blue or the intensity of each of these colors (channels) individually. The number of tones that can be expressed depends on the bit depth of the image. The distribution of tones in the image can be seen in the "Curves" palette histogram. *See also* **Bit depth**.
Tone curve	A visual tool for editing tones, enhancing brightness and contrast in a selected portion of the tone range. Changing the shape of the tone curve changes the mapping between input (the tones in the original image) and output (tones as they appear after editing). The digital equivalent of a densitometric curve. *See also* Tone.
TWAIN	A standard for input devices such as scanners and digital cameras. Applications that support TWAIN can acquire data from and TWAIN-compliant device.
Unsharp Mask	A filter for increasing the apparent sharpness of bit-mapped images. Sometimes abbreviated as "USM." Unsharp masks emphasize the differences in color and brightness between edges (outlines) and the rest of the image. *See also* **Halo width**, **Threshold**.
USB	**U**niversal **S**erial **B**us. A standard for computer serial interfaces which allows automatic "plug-and-play" recognition of peripheral devices and "hot plug" connection of peripherals while the computer or device is on.
White point	The input value above which all input tones are mapped to the maximum output value (the default for the master channel is white). Any details brighter than the white point will be lost. *See also* **Tone**, **Tone curve**.

Appendix C

Under Mac OS 9, the amount of memory required for best performance varies with the scanner used. The following table lists the total system memory needed for full use of all scanner functions, together with the recommended memory allocation for Nikon Scan when used as a "stand-alone" application. Use these values as a guide when **entering the preferred memory size (139)**.

Scanner	Total memory	Memory allocation ("preferred size")
9000 ED/8000 ED*	1.5 GB or more	800 MB
5000 ED/COOLSCAN V ED†	1 GB or more	450 MB
4000 ED/COOLSCAN IV ED†	768 MB or more	450 MB

*Memory required when scanning 6 × 9 medium-format film at full size using FH-869S film holder with Digital DEE (9000 ED only), Digital ICE, Digital ROC, and Digital GEM.

†Memory required when scanning forty frames using optional IA-20 (S) or SA-30 adapter (5000 ED, 4000 ED) or six frames using SA-21 (COOLSCAN V ED, COOLSCAN IV ED) with Digital DEE (5000 ED and COOLSCAN V ED only), Digital ICE, Digital ROC, and Digital GEM. Assumes all frames are previewed and scanned at full size.

Turn virtual memory off when using Nikon Scan. To turn virtual memory off, quit all applications, open the **Memory** control panel, select **Off** for "Virtual Memory," and restart the computer.

Allocating Memory to the Host Application

1. After making sure the host application is not running, open the application folder and click the host application icon once to select it. To allocate more memory to Nikon Scan when it is used as a "stand-alone" application, open the "Nikon Software：Nikon Scan 4" folder in the install location (the default installation folder is the "Applications" folder on the start-up disk) and click the **Nikon Scan** icon.

2. Select **Get Info (⌘ I)** from the Finder **File** menu. The application info dialog will be displayed.

3. Select **Memory** from the **Show** menu.

4. Consult the table on the previous page and enter the appropriate value for "Preferred size."