Nikon

Camera Control
Software for the Nikon D1

Nikon Capture

Reference Manual

Contents

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About This Manual

Welcome to *Nikon Capture*, the camera control software for the Nikon D1 digital camera. *Nikon Capture* makes it possible to view and edit photographs containing "raw" image data captured directly from the D1's image-sensing CCD (charge-coupled device) at settings of HI-RAW (see the D1 *User's Manual*). With the camera connected to a computer via an IEEE 1394 cable, you can also use *Nikon Capture* to take photographs from the computer, copy the contents of the camera's memory to the computer, and capture images to disk. The capacity to manipulate highly versatile, twelve-bit RAW data makes it possible to exploit the potential of your D1 to the full. Read these instructions thoroughly to ensure that you get the most from this software.

The documentation provided on this CD-ROM is composed of two parts: a *Quick Start* manual in HTML format that guides you step-by-step through the process of installation, and this reference manual, which provides detailed operating instructions.

Note

On the illustrations in this manual
This manual is for use with both the Macintosh and Windows versions of this product. While the majority of the illustrations in this manual are taken from the Windows version, the operations described apply to both the Macintosh and Windows versions. Depending on your operating system, however, some of the dialogs and menus may differ slightly from those shown in the illustrations. For information on operations specific to your OS, refer to the documentation provided with your operating system.

Note

This manual assumes familiarity with operations common to the Macintosh and Windows operating systems. Refer to the documentation provided with your operating system for more information.

This manual consists of the following main chapters:

Welcome to *Nikon Capture*!
Introduces the chief features of this software.

Basic Operation
Describes basic operations and introduces you to the tasks that can be performed using *Nikon Capture*. Tasks are introduced in the order they are typically performed, making this a perfect introduction for first-time users.

Capturing and Deleting Images
Explains how to load images from the camera and how to delete those that are no longer needed. It also describes how to save images to disk as they are taken.

Working with Images
Introduces basic operations that can be performed on images captured from the camera or read from disk.

Image Enhancement
Details the image enhancement operations that can be performed using *Nikon Capture* before images are saved in their final form.

Saving Images
Lists the options available when saving images to disk.

Camera Operation
Describes how to take photographs and make changes to camera settings from *Nikon Capture*.

Preferences
Details the options available in *Nikon Capture*'s Preferences dialog.

Reference
A quick guide to menu options.

Appendix A: Troubleshooting
Offers advice on dealing with common problems.

Appendix B: Glossary
Definitions of some of the technical terms used in this manual.

> **Note**
>
> Be sure to read the README file provided on the *Nikon Capture* installer disk, as it may contain information that could not be included in this manual.

Welcome to *Nikon Capture*!

Nikon Capture not only makes it possible to load photographs from your Nikon D1 digital camera and save them in a variety of commonly used image file formats, but it also allows you to control the camera directly from your computer and capture images as they are taken. With its comprehensive tools and simple, speedy interface, *Nikon Capture* brings out the full potential of your camera.

Principle Features

The main advantages offered by *Nikon Capture* are listed below.

Support for RAW Image File Format

In addition to JPEG and TIFF images created by the camera, *Nikon Capture* can be used to edit RAW image data from the camera's CCD. RAW image data can not be opened in any other application.

Support for IEEE 1394

Photographs taken with the D1 can be loaded into the computer for editing or to be saved to disk in one of a variety of image formats. The high-speed IEEE 1394 interface allows even large-volume, high-quality images to be loaded quickly. Photographs loaded from the camera are displayed as thumbnail previews, allowing you to easily choose the image you want.

Camera Control Function

Nikon Capture can be used to control the camera remotely while it is connected to the computer. Photographs can be displayed on your computer monitor immediately after they are taken, making *Nikon Capture* an invaluable tool in studio photography. *Nikon Capture*'s Camera Control supports operations such as time lapse photography that can not be performed with the camera alone. Photographs taken using the Camera Control function are saved directly to the computer's hard disk, without being stored in the camera's memory card.

Support for a Variety of Image File Formats

Nikon Capture allows you to choose an image file format suited to the task at hand. Twelve-bit, uncompressed RAW images can be saved without change in Nikon Electronic Image Format (NEF). Any enhancements made by the user are not applied to the image but are saved separately in the same file, leaving the original data untouched. Once saved, NEF images can be opened and saved in a format supported by other imaging applications. This makes it possible to process a single image in a number of different ways without any loss in image quality.

Image Enhancement

Nikon Capture offers tools for adjusting white balance (RAW images only), brightness, contrast, color balance, tone curves, and sharpness, allowing images to be optimized for the task at hand before they are saved in a format supported by other applications. The Curves window offers precise control over tone levels, while a separate Color Adjustment window provides simple controls for adjusting brightness, contrast, and color balance.

Saved Settings

Camera control and image enhancement settings can be saved and recalled as desired.

Auto Save Mode

Using *Nikon Capture*, you can convert photographs to any of the supported formats and save them directly to disk as they are taken. Photographs are not saved to the camera's memory card, making it possible to take an almost unlimited number of photographs.

On-line Help

Interactive, on-line help provides you with the answers you need, instantly.

Basic Operation

This chapter explains the basic operation of the *Nikon Capture* software. After installing *Nikon Capture*, please read this chapter thoroughly to ensure proper usage, as well as to maximize all of the benefits *Nikon Capture* has to offer when used with a D1 digital camera.

The section "Using *Nikon Capture*" introduces and explains basic operating procedures for using *Nikon Capture*. By following the procedures as explained, the user will quickly master the basics of *Nikon Capture*. For more information regarding the D1's buttons, functions and settings, please refer to the camera *User's Manual*.
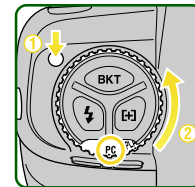
> **Note**
>
> It is recommended that the camera be powered by an EH-4 AC adapter (available separately) while connected to a computer.

Before Starting *Nikon Capture*

1 Turn the camera on.
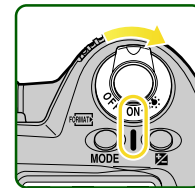
2 Turn the mode dial on the camera to "PC" (PC mode).

   PC mode allows communication between the camera and your computer. Communication is not possible with the mode dial set to any other setting.

3 Connect the camera to the computer via its IEEE 1394 interface (see the camera *User's Manual* or the documentation provided with your computer for more information).
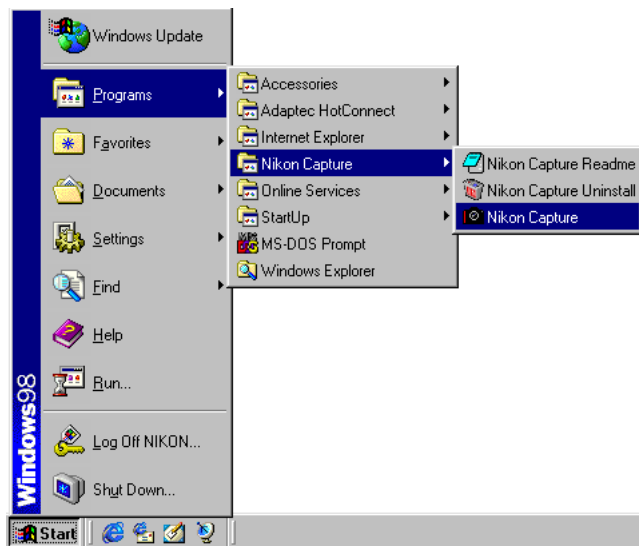
> **Note**
>
> It is recommended that you connect the cable after turning the camera on. As some time is required for a connection to be established after the cable has been connected or disconnected, allow a brief pause before beginning operations. Unplug the cable before turning the camera off.
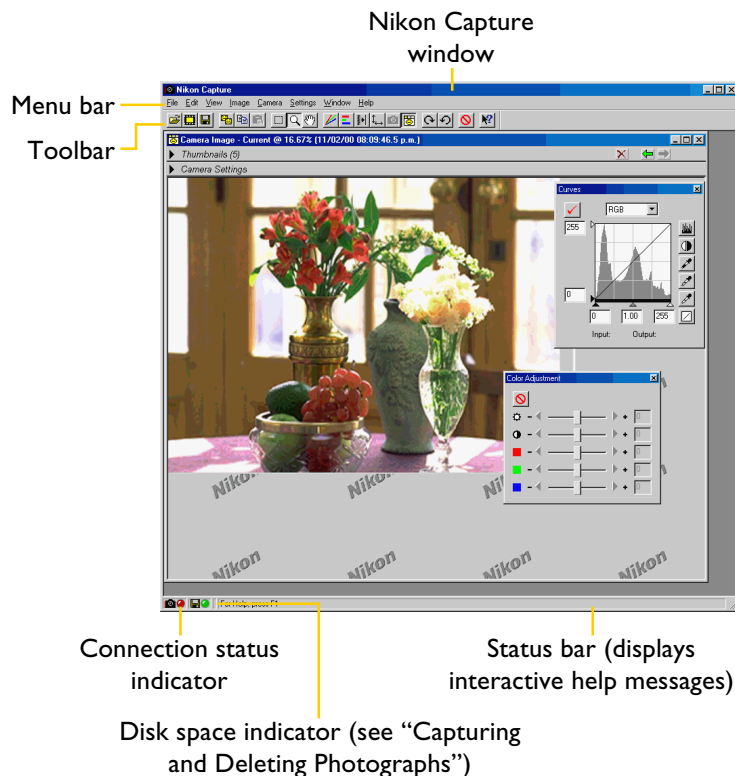
Starting *Nikon Capture*

Windows

1 Turn on the computer and start Windows.

2 Select **Nikon Capture** from: **Start** menu > **Programs** > **Nikon Capture**.

> ### Note
>
> If *Nikon Capture* is started with the camera connected and camera Custom Setting item 28 ("Save Raw Images") set to "0" ("RAW data format not available"), a warning will be displayed. Click **OK** in the warning dialog to change the setting to "1" ("RAW data format available"). You will then be able to take photographs at a setting of HI-RAW (a high-quality format that stores photographs as "raw," twelve-bit data taken directly from the camera's CCD), which can be viewed and edited in *Nikon Capture*.

The Nikon Capture window will open on the desktop.

Nikon Capture window

Menu bar

Toolbar

Connection status indicator

Status bar (displays interactive help messages)

Disk space indicator (see "Capturing and Deleting Photographs")

> ### Note
>
> In addition to the Nikon Capture window, any other windows that were open the last time you quit *Nikon Capture* will also be displayed when the program starts up (when you first start the program after installation, the Camera Image, Curves, Unsharp Mask, and Size/Resolution windows will be displayed). If images remained in the Camera Image window when you last quit *Nikon Capture*, the Camera Image window will also be displayed.
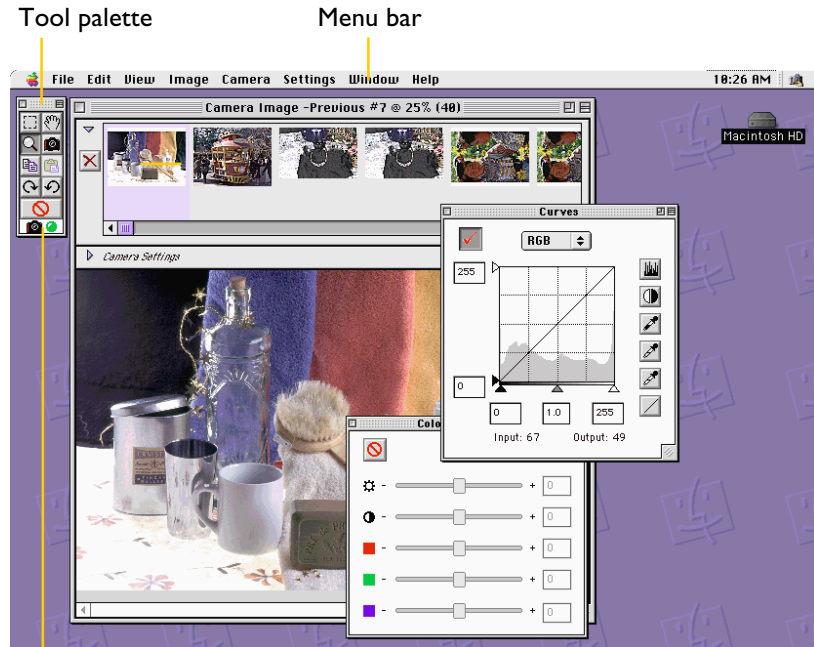
Macintosh

1 Start your computer.

2 Open the Nikon Capture folder (located in the folder to which you installed *Nikon Capture*) and double click the **Nikon Capture** application icon.

Nikon Capture

The application menu bar and tool palette will be displayed.

Tool palette   Menu bar

Connection status indicator

Quitting *Nikon Capture*

Windows

In Windows there are three options:

•   Select **Exit** from the **File** menu
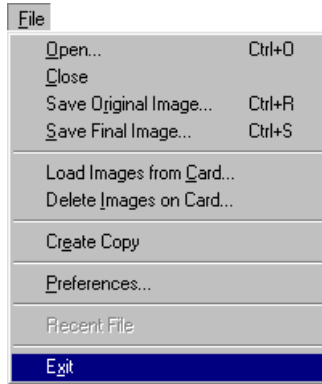
•   Click on the Close tool button (|×) in the upper right corner of the Nikon Capture window

•   Select **Close** from the **Control** menu in the title bar of the Nikon Capture window

Macintosh

On a Macintosh there is only one option:

•   Select **Quit** from the **File** menu

Using *Nikon Capture*

With the camera connected to your computer in a studio setting, you can use *Nikon Capture* to take photographs and save them to disk. *Nikon Capture* can also be used to view the contents of the camera's memory on your computer's monitor, where you can select images to be captured, edit images, and save them to disk as outlined in this chapter. For details on the operations described here, see "Capturing and Deleting Photographs."

Step 1—Capturing Images to the Computer

Images can be captured from the camera using one of the following two methods:

Capturing Photographs as They Are Taken (Studio Photography)

With the camera connected and set to PC mode, photographs can be taken and transferred to your computer's hard disk over the IEEE 1394 interface, without being saved to the camera's memory card. The camera can be controlled directly or with *Nikon Capture*'s Camera Control function. Photographs taken in Auto Save mode are similarly not recorded to the camera's memory card, but are instead saved directly to a user-specified folder on the computer.
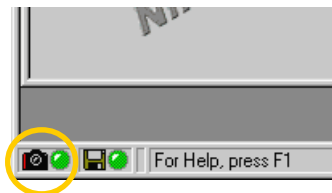
Loading Images from the Camera

Images saved on the camera's memory card can be loaded into *Nikon Capture*'s Camera Image window via the IEEE 1394 interface, or you can read images directly from the card using a CompactFlash card reader or a PC card adapter and a PCMCIA Type II card slot.

CONCEPT
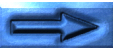
This section outlines how to take photographs and capture them to your computer in real time. Details may be found in the following chapter, "Capturing and Deleting Photographs."

1 Check the status of the connection between the camera and the computer. If the two are properly connected, the connection status indicator at the bottom left corner of the Nikon Capture window (Windows) or tool palette (Macintosh) will be green.

Connection status is also displayed in the control panel on top of the camera. If *Nikon Capture* is started with the camera connected, the number of remaining exposures will show **PC**. While this indicator is displayed, photographs taken by the camera will not be saved to the camera's memory card; instead, they will be recorded directly to the computer.

2 Adjust camera settings, frame a photograph, and focus (see the D1 *User's Manual* for information on camera settings).
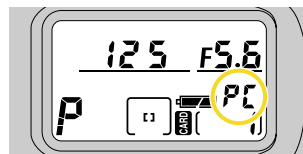

Tip

The connection status indicator
The color of the connection status indicator shows the status of the connection between the computer and the camera.
- ● Normal connection. The camera is ready to transfer data or data are being transferred.
- ● No connection. Either the camera is not connected, or the connection is not functioning properly. See "Troubleshooting" for more information.

Clicking the connection status indicator displays a message detailing connection status.

3 Press the shutter-release button all the way down to take a picture. The photograph will be transferred to the computer and displayed in the Camera Image window.
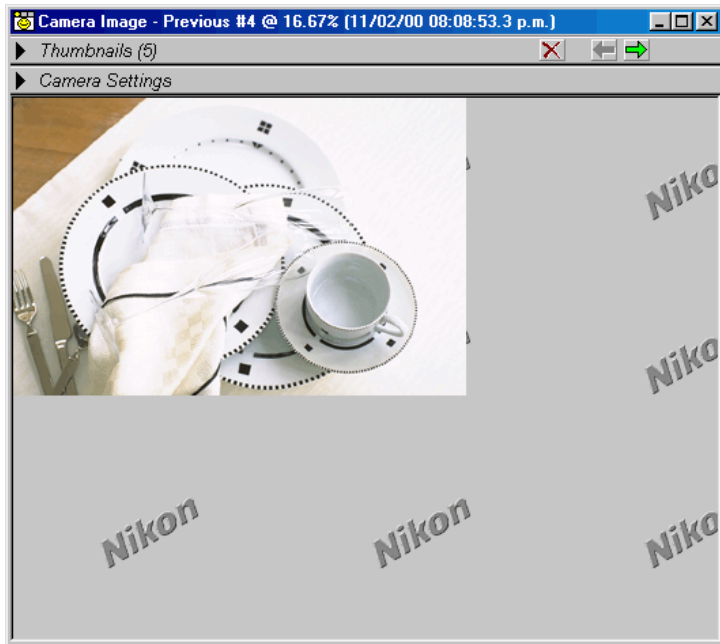
Each time you press the shutter-release button, the resulting photograph will be transferred to the computer and displayed in the Camera Image window.

The Camera Control Window

Clicking the Camera Control tool button (📷) opens the Camera Control window, where you can view the camera settings currently in effect or confirm changes (any changes to settings made from the camera are reflected instantly in the display in the Camera Control window). The Camera Control window can also be used to make changes to settings and take photographs remotely. Photographs taken when the **Shoot** button is pressed are captured and displayed in the Camera Image window.
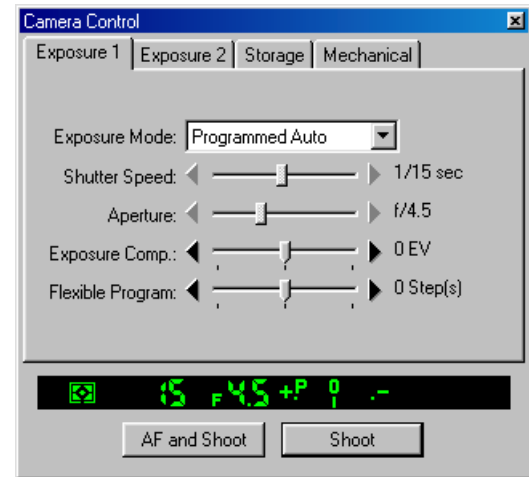
See "Camera Control" for details of the options available in the Camera Control window.

Step 2—Viewing Thumbnails

Using thumbnails (small previews of your photographs), it is possible to view at a glance all photographs that have been captured to your computer.

In the Camera Image window, click the **Thumbnails** arrow (▶) to open the Thumbnails section.

The Thumbnails section will open, with all recently captured images visible. Any previously captured images that have not been deleted are also visible.
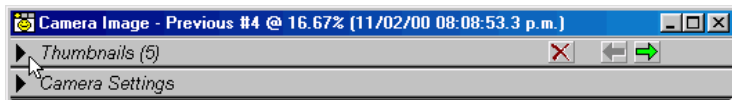
Note

Images that have been captured to the computer are stored at full size in a thumbnail folder. The images you see in the Thumbnails section are the images in that folder. If thumbnails are deleted from the Thumbnails section, the full-sized image will also be deleted from the thumbnail folder. The thumbnail folder is that designated in the File Locations tab of the Preferences dialog (by default, the folder "Thumb" in the directory to which *Nikon Capture* was installed).

Step 3—Selecting Thumbnails

Select previews from the Thumbnails section when you want to view, edit, or save a photo.

Click on the thumbnail of the image you want to work with. The thumbnail you selected will be highlighted with a colored border and the image will appear in the Preview section.

Preview section

Selecting Multiple Thumbnails

You can also select multiple images from the Thumbnails section.

Windows

Hold the **Ctrl** key while clicking, one at a time, the images you want to work with, or, if you want to work with several successive images, click on the first and last image while holding the **Shift** key.
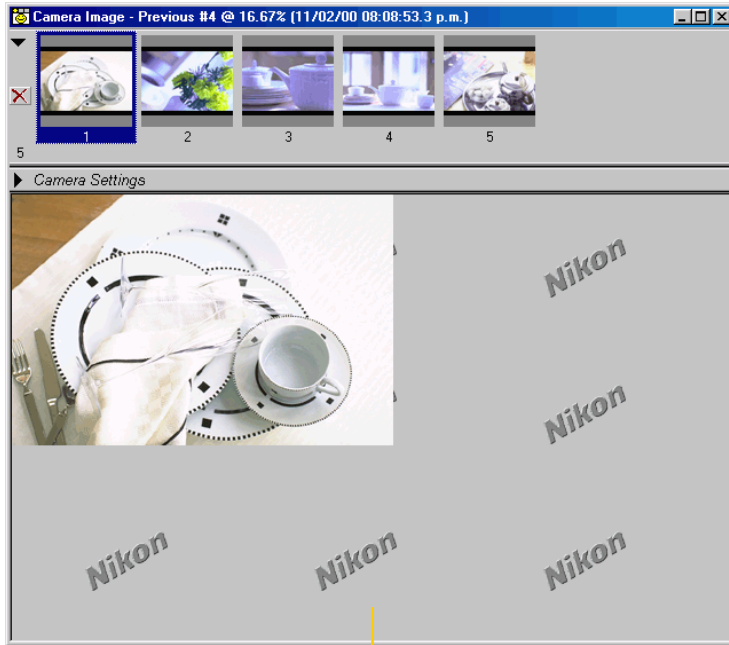
Macintosh

Hold the command key (⌘) while clicking, one at a time, the images you want to work with, or, if you want to work with several successive images, click on the first and last image while holding the **Shift** key.

To Select All Thumbnails

Choose **Select All Thumbnails** from the **Image** menu.

Note

Although selecting several, or all, thumbnails is convenient when saving or deleting images, when more than one thumbnail is selected, no image will be displayed in the Preview section of the Camera Image window. When you want to edit an image, select only that image from the Thumbnails section.

Step 4—Viewing Photo Information

CONCEPT

While a photograph is displayed, it is possible to view the settings in effect at the time the photograph was taken.

1 Click on the **Camera Settings** arrow (▶), located just below the Thumbnails section, to display camera settings.
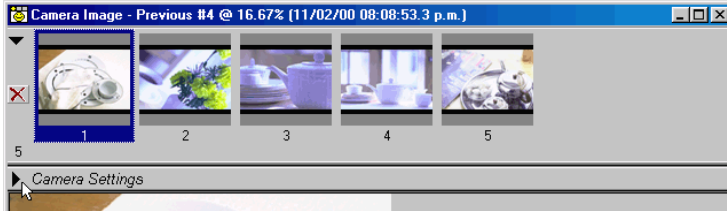
The Camera Settings section will show the date of recording and camera settings for the image currently selected.
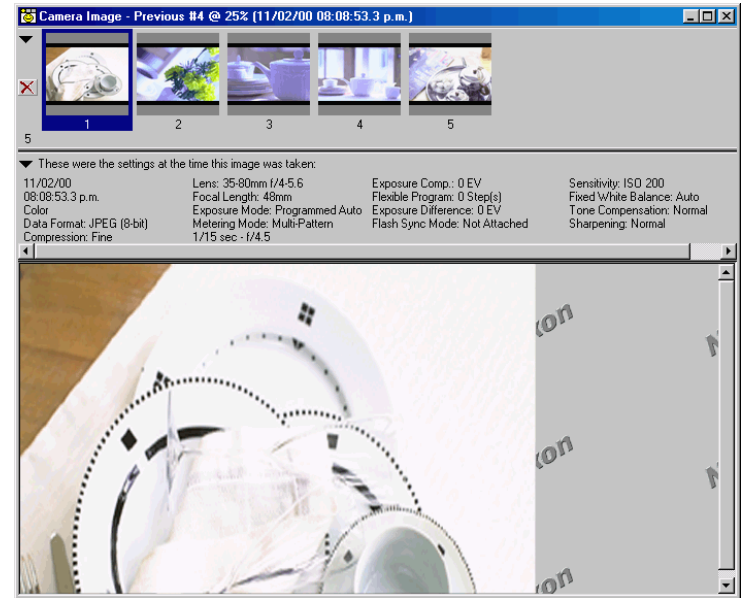
2 Click the **Camera Settings** arrow (▼) a second time to close the Camera Settings section.

Step 5—Cropping Images

CONCEPT

Using the Crop tool, you can select a portion of the image to be saved in a format that can be read by other programs.

1 Click on the Crop tool button (⬚). The mouse pointer will take the form of a selection cursor (+).

2 Drag the cursor diagonally across the image to select a rectangular crop.
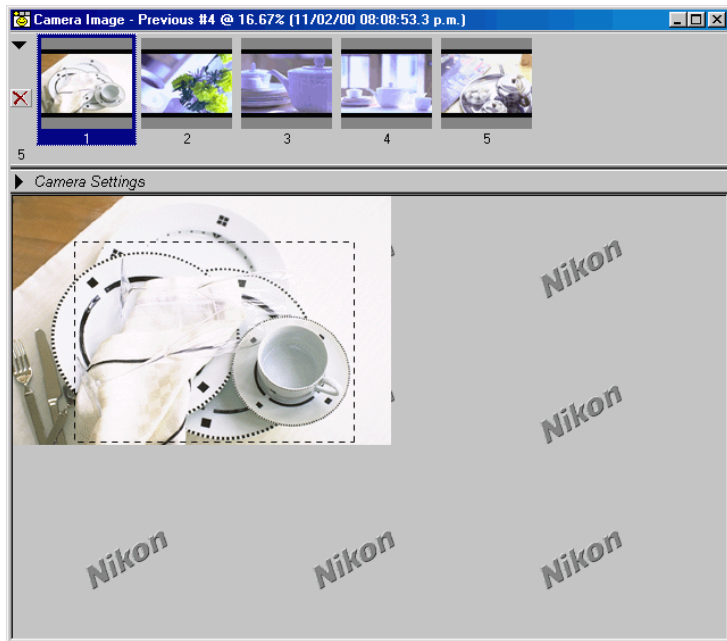
After you have selected the portion of the image you wish to work with, you can zoom in on the crop.

3 Click on the Zoom Cursor tool (🔍). The mouse pointer will take the shape of a zoom cursor (🔍).

4 Click the zoom cursor in the middle of the area to be zoomed in.

Tip

When viewing an image at a size that makes it larger than can be displayed in the Preview section, it is possible to call up a smaller copy of the image to use as a guide. This function is called "Bird's Eye." Select **Bird's Eye** from the **View** menu to display the Bird's Eye window.

The Bird's Eye window will show a red box around the area presently visible in the Preview section. The portion of the image being viewed may be adjusted by using either the Grab tool (✋) and adjusting the view from the Preview section, or by dragging the red box in the Bird's Eye image to a new location (see "Working with Images: The Bird's Eye Window").
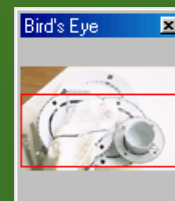
Red box marks area visible in Preview section

Step 6—Determining Image Size and Resolution

You can adjust the size and resolution of the final image from the Size/Resolution window to suit the task at hand. The output size gives the dimensions of the cropped section when output on a printer or monitor at the specified resolution.

1 Select **Size/Resolution** from the **View** menu (in Windows, you can also click on the Size/Resolution tool button (↕↔) in the toolbar).
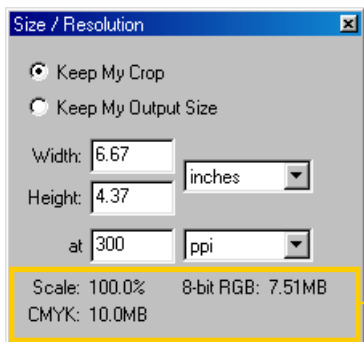
Output scale and file size

2 Adjust the size (in pixels, inches, millimeters, etc.) and the resolution to meet your specific requirements. Any changes will be reflected in the Scale display, which shows the output size of the image as a percentage of the input size.

Note

The **Settings for Next Camera Image** option in the General tab of the Preferences dialog specifies whether the settings used for the size and resolution of an image when captured to your computer are the default settings, or the settings applied the last time images were captured from the camera (see "Preferences: The General Tab"). Size/Resolution settings can be saved and recalled using the options available in the **Settings** menu. See "Image Adjustment" for more information.

Note

When the unit selected for measuring height and width is **pixels**, resolution can not be changed.
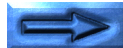
Step 7—Image Enhancement

CONCEPT

Nikon Capture is not a photo retouch program; rather, it serves to provide access to the full potential of the Nikon D1 digital camera system. It does, however, allow some manipulation of captured images with its Color Adjustment, Curves, and Unsharp Mask functions. It also provides a choice of file formats which can then be opened and edited with any standard third-party imaging software, such as *Adobe Photoshop*, or uploaded directly to a web page. One of *Nikon Capture*'s most notable features is that it permits direct manipulation of RAW image data—twelve-bit image data from the camera's CCD. When RAW images are saved in Nikon Electronic Image Format, or NEF, adjustments made using *Nikon Capture*'s image enhancement functions are not applied directly to the image data but are saved separately in the same file, so that the original image data are always available for editing.

Color Adjustment

Adjustments to an image's brightness, contrast and/or color balance can be made from the Curves window or the Color Adjustment window.

From the Curves window, adjustments can be made to the tone curves that map the correspondence between input and output tones, correcting or changing tone levels. Curves are a convenient tool for users with some knowledge of tone curves, white point, black point, contrast, and gamma, or for those who wish to make precise adjustments to a portion of the tone curves.

The Color Adjustment window is, in comparison to the Curves window, much less complex and has fewer functions. Simple adjustments to brightness, contrast, and color balance can be made from this window. It is suited to users who are new to image retouching or to those who want to make adjustments that affect the entire image in a uniform way.

Note

Changes to Curves and Color Adjustment can not be applied simultaneously to a single image. Given that only one of these tools can be used for any given image, you should choose the tool you want according to the task at hand and your knowledge of image editing techniques.
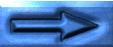
Unsharp Mask

For photos that lack sharpness, *Nikon Capture*'s Unsharp Mask function is ideal for sharpening outlines of an image. Because the Unsharp Mask function applies to information gathered from the Size/Resolution, Curves, and Color Adjustment windows, the user should adjust Unsharp Mask last. When viewing the effects of Unsharp Mask in the monitor, it is recommended that you set the zoom ratio in the active window to 1:1 (100%).

Tip

As with image Size/Resolution, the Curves, Color Adjustment, and Unsharp Mask settings that apply when an image is first loaded into *Nikon Capture* are determined using the **Settings for Next Camera Image** option in the General tab of the Preferences dialog. With each window, you have the choice of capturing images with default settings, or the settings applied the last time an image was captured. Also, like Size/Resolution, a variety of options are available in the **Settings** menu for saving, loading and changing defaults to the Curves, Color Adjustment and Unsharp Mask functions.

Applying Changes

The settings in the Curves, Color Adjustment, and Unsharp Mask windows can only be adjusted and applied when the Apply button for the window is checked (✓). If the Apply button is off (🚫), clicking on it once will turn it on. Note that Curves and Color Adjustment settings can not be applied simultaneously to a single image.

Hiding Changes

Changes to the image in the active window can be hidden by clicking and holding the Show Original Image Data tool button (🚫) in the toolbar (Windows) or tool palette (Macintosh). The original image will be displayed only while the button is held down, making possible quick "before-and-after" comparisons that help you decide whether image enhancement is having the desired effect.

Windows Toolbar

Macintosh Tool Palette

"Show Original Image Data" tool button
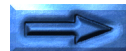
The Curves Window

To display the Curves window, select **Curves** from the **View** menu (in Windows, you can also click on the ✎ tool button in the toolbar).

Apply button

Current channel

View edited histogram

Auto contrast

Black point

Midpoint

White point

Reset all curves to linear
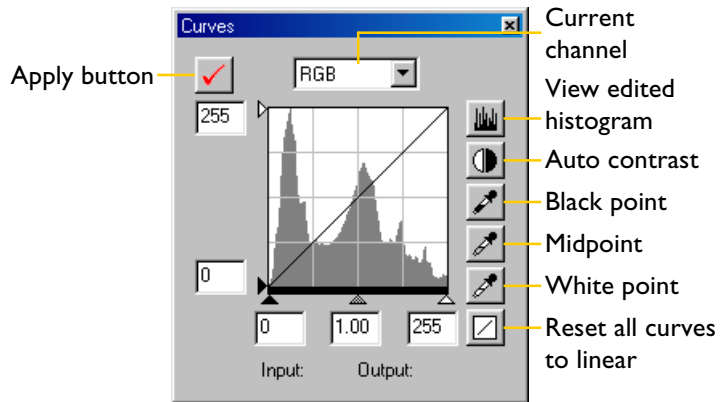
When the Apply button in the Curves window is on, the Apply button in the Color Adjustment window automatically turns off. It is not possible to apply changes to both Curves and Color Adjustment simultaneously to a single image.

Tone curves for each of the red, green, and blue channels, and for the master RGB channel, can be selected from the pop-up menu at the top of the window. The sliders at the bottom and left side of the histogram control the black point, midpoint, and white point. Complex adjustments to tones can be made by adding and moving points on the curves. The histogram shows the distribution of tones in the original image and, when the View Edited Histogram button is held down, the distribution of tones after curves have been edited. With reference to this tool, and by observing the effects of changes on the image in the Preview section, you can make changes to curves that enhance the color balance, brightness, and contrast of the image.

The Color Adjustment Window

To display the Color Adjustment window, select **Color Adjustment** from the **View** menu (in Windows, you can also click on the ▤ tool button in the tool bar).

Apply button — ✓
Brightness — ☼
Contrast — ◐
Red — ■
Green — ■
Blue — ■
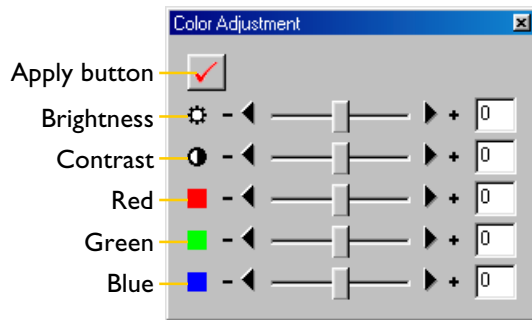
When the Apply button in the Color Adjustment window is checked, the Apply button in the Curves window automatically turns off. Adjustments can be made to brightness, contrast, and color balance using the sliders or by entering values directly in the text boxes.

The Unsharp Mask Window

To display the Unsharp Mask window, select **Unsharp Mask** from the **View** menu (in Windows, you can also click on the ▸ tool button in the toolbar).

Apply button — ✓   55 ⇥ ⇤ 200   ... — Define tone ranges (shadows, midtones, and highlights)

Unsharp Mask list —
RGB, All Tones, 36%, 23%, 75
Blue, All Tones, 6%, 5%, 0
RGB, Midtone, 20%, 5%, 0
Red, Shadow, 21%, 5%, 0
Green, Highlight, 69%, 42%, 0

RGB   Midtone   ⚠
Intensity: ◀ — ▶ 20 %
Halo Width: ◀ — ▶ 5 %
Threshold: ◀ — ▶ 0 levels
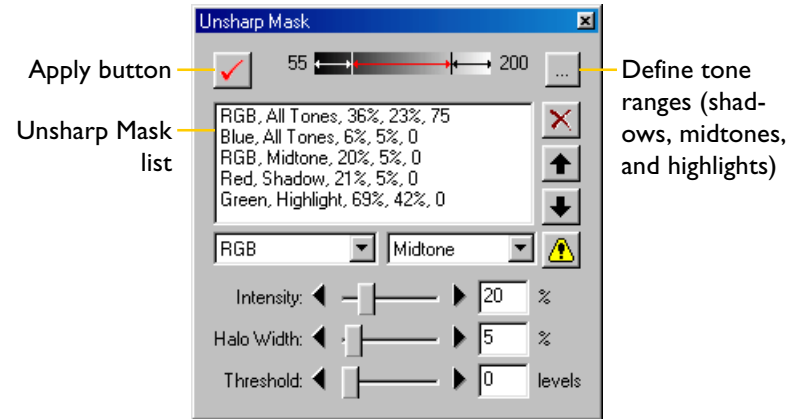
Unsharp masks can be applied selectively to different color channels and tone ranges. The effects of Unsharp Mask, modified for any changes to settings in the Curves or Color Adjustment windows, are visible in the image in the Preview section.

Step 8—Saving Images

Once all necessary editing for size, resolution, tone, color, and sharpness has been completed, you should save the image to a folder on your computer. Photographs can be saved in NEF format using the **Save Original Image…** option, or saved in a standard image format such as JPEG or TIFF using the **Save Final Image…** option.

Save Original Image…

Use this option to save the image in NEF format. Although the original image data from the camera are saved without modification, information about changes to size, resolution, curves, color adjustment, and sharpness are saved separately in the same file. This file can be opened later using *Nikon Capture* and saved again in a format that can be opened by third party applications such as *Adobe Photoshop* or *Internet Explorer*.

Save Final Image…

This option saves the image in a format, chosen by the user, which can be read by third party applications such as *Adobe Photoshop* and *Internet Explorer*. The image can, however, no longer be opened with *Nikon Capture*. For more information on file formats, see "Saving Images: File Formats".
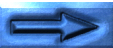
Follow these steps to save an image in TIFF (RGB) format.

1 Select **Save Final Image…** from the **File** menu (in Windows, you may also click on the 🖫 tool button in the toolbar). A dialog similar to that shown below will appear:

Save Final Image

| Save in: | 🎨 Desktop |

My Computer
My Documents
Online Services

File name: Image1.tif   Save

Save as type: TIFF Format (RGB)   Cancel

☐ Use Compression   Good balance

Color Adjustment: Applied   Unsharp Mask: Applied
☑ Crop and Scale   ⊙ 8-bit   ○ 16-bit
☐ Open in
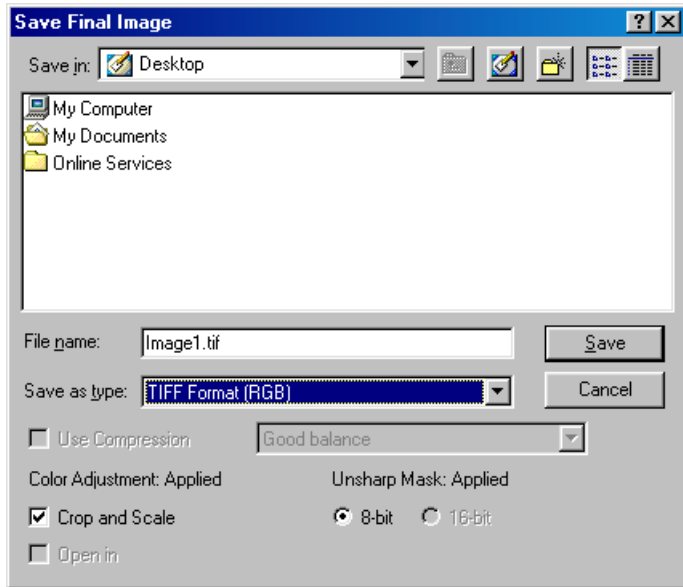
2 Navigate to the folder to which the image is to be saved.

3 Select a file type (format) of TIFF (RGB).

4 Name the image.

5 Click **Save**.

Step 9—Deleting Thumbnails

As the images in the temporary thumbnails folder occupy a considerable amount of disk space, it is recommended that you empty the temporary thumbnails folder when they are no longer needed.

Deleting Selected Thumbnail(s)

1 Select the thumbnail(s) you want to delete from the Thumb-nails section (the selected image(s) will be highlighted).

2 Choose **Remove Selected Thumbnails** from the **Image** menu or click the delete button (❌) in the Thumb-nails section.

Tip

Two options for removing thumbnails automatically are available in the Thumbnails tab of the Preferences dialog.

Clear Camera Image Window on Exit
If this box is checked, a confirmation dialog will be displayed when you exit *Nikon Capture*, where you can opt to delete all thumbnails.

Auto-Remove Thumbnail after Save
If this box is checked, the associated thumbnail will be removed when the image is saved.

Deleting All Thumbnails

• Select **Remove All Thumbnails** from the **Image** menu to remove all thumbnails from the Camera Image window and delete all image files in the thumbnail folder.

Note

Once deleted, thumbnail image data can not be restored. Be sure that the data are no longer required before deleting thumbnail images.

Capturing and Deleting Photographs

Using *Nikon Capture*, you can view or delete photographs already stored in your camera's memory, or capture photographs for display and editing on your computer as they are taken. This chapter covers the following topics:

- Saving photographs directly to your computer's hard disk as they are taken
- Reading photographs already stored in the camera
- Deleting photographs from the camera's memory
- Formatting the camera's memory card from the computer
- Reading images directly from the memory card using a card reader or PCMCIA adapter

Caution

When you are capturing or deleting photographs from the camera, or formatting memory cards for use in the camera, the camera must be connected to your computer in PC mode. *Do not disconnect the camera or turn the camera off while data transfer is in progress or while formatting memory cards.* This could result in data corruption or software malfunction.

Capturing Photos as They Are Taken

CONCEPT

When the D1 is connected in PC mode and *Nikon Capture* is running, you can save photographs directly to your computer's hard disk as they are taken, rather than to the camera's memory card. You can operate the camera directly or make changes to settings and release the shutter remotely using *Nikon Capture*'s Camera Control window, where you can confirm changes to settings as they are made.

Tip

Using Auto Save, photographs can be saved to a specified folder on your computer's hard disk without being displayed in the Camera Image window. See "Saving Images: Saving Photographs Directly to Disk".
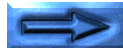
Taking Photographs from the Camera

1 Adjust camera settings, frame a photograph, and check focus (see the D1 *User's Manual* for detailed instructions).

2 Press the shutter-release button all the way down to take a photograph. The photograph will be captured and displayed in the Camera Image window.
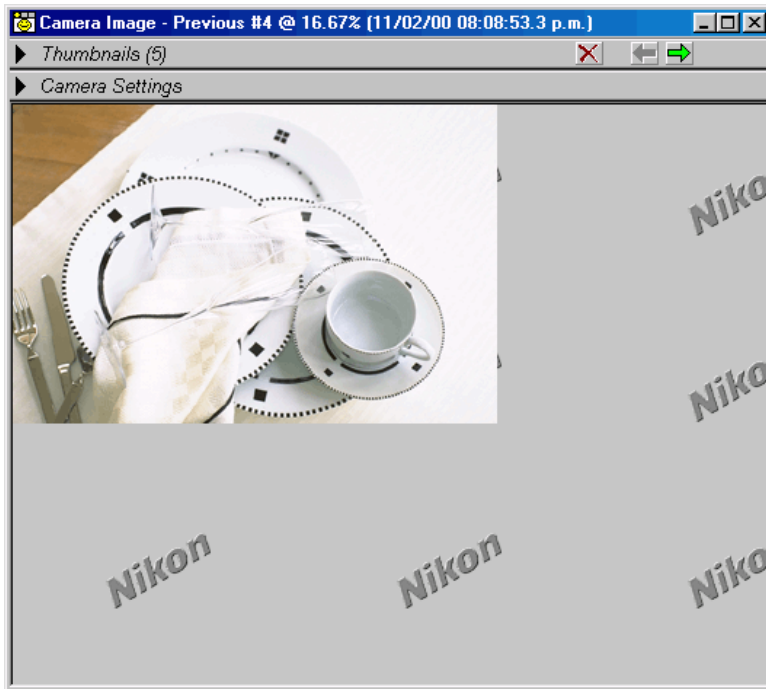
Each time you release the shutter, the resulting photograph will be displayed in the Camera Image window.

Tip

"Continuous shooting" and "single-frame shooting" in PC mode

- In PC mode, you can choose between continuous and single-frame shooting using Custom Setting item 30 (see "Custom Settings" in the camera *User's Manual*). This setting can also be changed from the "Mechanical" tab of the Camera Control window.

  In continuous shooting mode, photographs will be taken one after another as long as the shutter-release button on the camera is held down. The **Shoot** and **AF and Shoot** buttons in the Camera Control window function as they do in single-frame shooting mode, with one photograph being taken each time either button is clicked.

  Photographs taken in continuous shooting mode are stored in a temporary buffer in the camera's memory, making it possible to take a picture while the previous photograph is being transferred to the computer. If Custom Setting 26 ("Maximum Number of Consecutive Shots in Continuous Shooting Mode") is set to "1" when the camera is in continuous shooting mode, although only one photograph will be taken each time the shutter-release button is pressed, you will be able to take the next photograph without waiting for the preceding picture to be transferred to the computer.

- Images are not displayed in the camera's LCD monitor in Capture Preview or Record-and-Review modes when the camera is in PC mode.

Taking Photographs from the Camera Control Window

Photographs can be taken from the computer using the controls in the Camera Control window.

1 Click the camera control button (📷) or select **Camera Controls** from the **View** menu to open the Camera Control window.
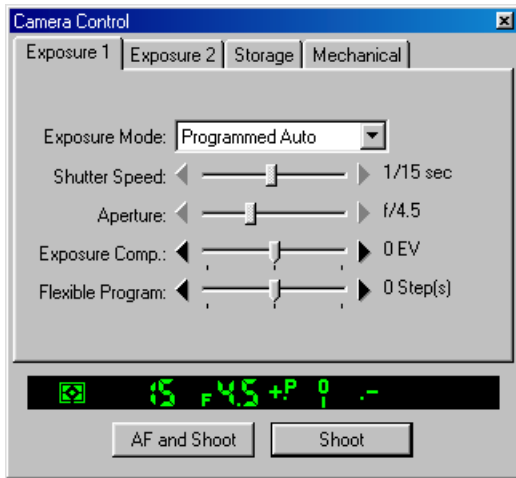
Current camera settings are displayed in the Camera Control window's Exposure 1, Exposure 2, Storage, and Mechanical tabs and in the Viewfinder panel at the bottom of the window. The Exposure 1 tab is shown above.

2 Adjust camera settings using the four tabs (see "Camera Controls" for more information).

3 Click **AF and Shoot** or **Shoot** to take a picture. The resulting photograph will be displayed in the Camera Image window.

Loading Images from the Camera

While the D1 is connected to your computer, you can load photographs previously taken with the camera into the Camera Image window in *Nikon Capture*. Follow these steps:

1 Select **Set Camera Card Folder…** from the **Camera** menu.

2 From the Browse for Folder dialog, choose the folder containing the photographs you want to view, then click **OK**.

Browse for Folder

Select the active folder on the CF Card:

- CF ROOT
  - 100NC_D1
  - 101NC_D1

OK   Cancel   Help
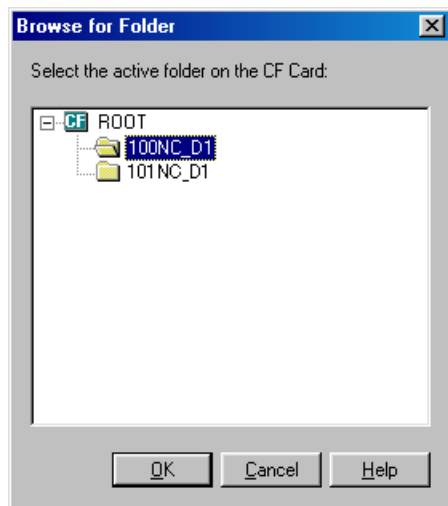
Tip

Images loaded from the camera are stored in the thumbnail folder specified in the File Locations tab of the Preferences dialog (see "Preferences: The File Locations Tab"). Any changes made in *Nikon Capture* apply only to the copies in the thumbnail folder; the originals in the camera are not affected.

3 Select **Load Images from Camera** from the **Camera** menu. The images in the camera will be loaded into *Nikon Capture* and the most recent image will be displayed in the Camera Image window.

Camera Image - Current @ 12.50% (11/02/00 08:09:46.5 p.m.)

1   2   3   4   5

5

Camera Settings

Tip

Photographs taken with the D1 are stored in folders on the memory card, each containing up to 999 photographs. Folder names consist of a three-digit number, assigned in ascending order starting from 100, followed by the letters "NC_D1". New folders are created when the maximum of 999 photographs is reached or when the user selects NEW from the FOLDERS submenu in the camera playback menu. See the camera *User's Manual* for more information.

Adjusting White Balance for RAW Images

The human eye is able to adapt to changes in lighting, and consequently to humans a white object will still look white whether viewed in sunlight or under overcast skies, or indoors under incandescent or fluorescent lighting. A digital camera, in contrast, must adjust colors according to lighting in order that colors that appear white when viewed directly also appear white in the final photograph. This adjustment is called "white balance."

Nikon Capture is equipped with white balance adjustment for modifying RAW images captured or copied from the camera on those occasions when you are unable to achieve the desired results using the camera's menu of white balance options. This white balance adjustment functions in a fashion similar to the D1's preset white balance. When preset white balance is measured with the D1, a white object is used as a reference point. In the case of the white balance adjustment window, white balance is set by sampling a point or points that under normal lighting would be white or close to white. *Nikon Capture* uses this information to adjust the slope of the red and blue tone curves to produce a white balance appropriate to the image.

Note

White balance adjustment can be performed on RAW images only. The **Adjust White Balance…** option in the **Image** menu is not available when the image in the active window is JPEG or TIFF.

Adjusting White Balance

1 Select **Adjust White Balance…** from the **Image** menu. The White Balance Adjustment window will be displayed.
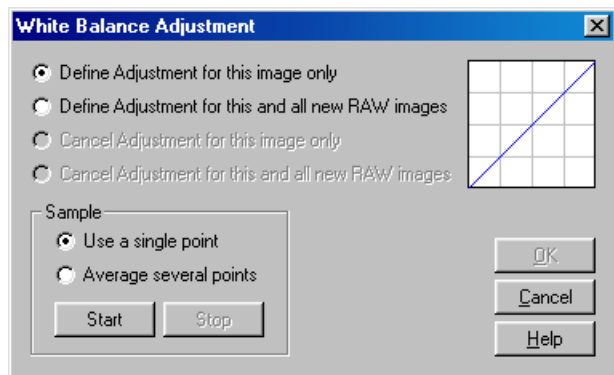
2 Using the radio buttons listed below, select the images to which white balance adjustment will apply.

Define Adjustment for this image only

When this option is selected, white balance will be adjusted for the active image only; subsequent images captured or loaded from the camera will not be affected.

Define Adjustment for this and all new RAW images

Select this option to use the point or points sampled for the active image as the reference for white balance both for the current image and for all RAW images subsequently captured or loaded from the camera. This option is useful when the current image is the first of a series of photographs that will be taken under the same lighting.

3 Sample the image to choose a reference value for white balance. You can define white balance using a single point or the average of several points.

Using a Single Point to Define White Balance

Click the **Use a single point** radio button, then click the **Start** button. The cursor will take the shape of an eyedropper when moved over the image in the active window. To adjust white balance, click a point in the image that would be white under normal lighting.

Using the Average of Several Points to Define White Balance

Click the **Average several points** radio button, then click the **Start** button. The cursor will take the shape of an eyedropper when moved over the image in the active window. You can then sample points in the image that would be white under normal lighting by clicking. If you select more than one point, the average will be used to determine white balance. When you have sampled all the desired points, click **Stop** to end sampling.

The effects of white balance adjustment on the red and blue tone curves are visible in the graph at the top right corner of the window.
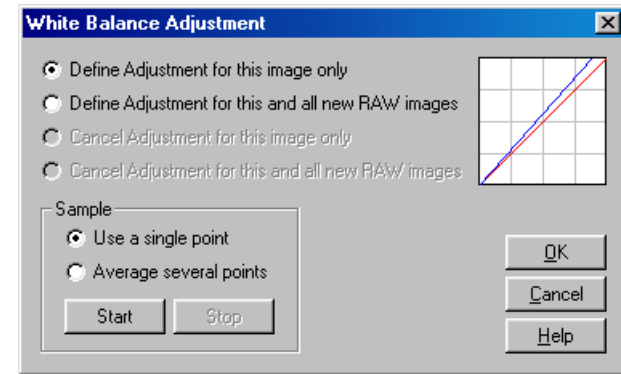
4 Click **OK** to apply the results of white balance adjustment to the selected image.

Canceling White Balance Adjustment

1 Select **Adjust White Balance…** from the **Image** menu. The White Balance Adjustment window will be displayed.

White Balance Adjustment

- ⊙ Define Adjustment for this image only
- ○ Define Adjustment for this and all new RAW images
- ○ Cancel Adjustment for this image only
- ○ Cancel Adjustment for this and all new RAW images

Sample
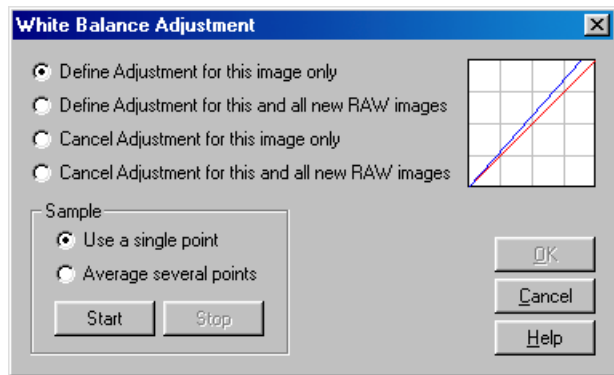- ⊙ Use a single point
- ○ Average several points

Start   Stop

OK
Cancel
Help

2 Using the radio buttons listed below, choose whether to cancel white balance for the current image only or for both the current image and all subsequent RAW images captured or loaded from the camera.

Cancel Adjustment for this image only
Select this option to cancel white balance adjustment for the image in the active window only.

Cancel Adjustment for this and all new RAW images
Select this option to cancel white balance adjustment both for the image in the active window and for all subsequent RAW images captured or loaded from the camera. This option is not available if **Define Adjustment for this image only** was selected for the last adjustment performed.

3 Click **OK** to complete the operation.

Tip
To determine whether or not white balance adjustment is currently in effect, check the **Adjust White Balance…** item in the **Image** menu. A checkmark appears next to this item when white balance adjustment is in effect.

Deleting Camera Images

Using *Nikon Capture*, you can delete all photographs from a specified folder on the memory card currently inserted in the camera (photos can not be deleted individually). Only folders conforming to the Design Rule for Camera File Systems can be selected. Once deleted, photographs can not be recovered; be sure to back up any photographs you would like to keep.

1 Select **Set Camera Card Folder…** from the **Camera** menu.

2 Choose the folder containing the photographs you want to delete, then click **OK**.
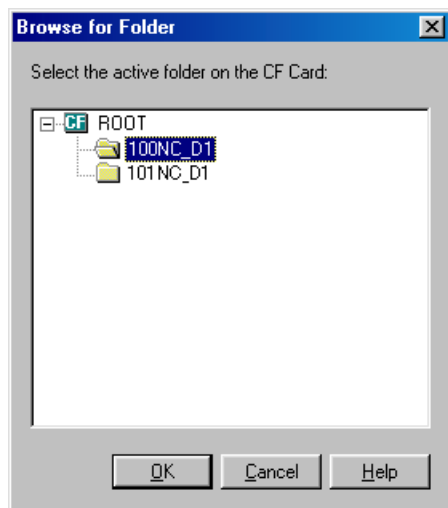
3 Select **Delete Images in Camera** from the **Camera** menu.

4 Click **OK** in the confirmation dialog that appears.
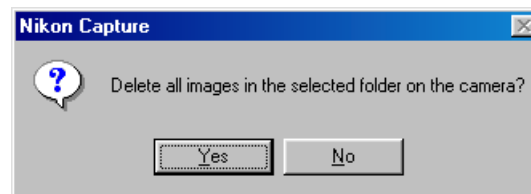
All images in the selected folder will be deleted.

Tip

The **Delete Images in Camera** option can only be used to delete all photographs in a folder. To delete individual photographs, use the procedures described in the D1 *User's Manual*. *Nikon View DX* software (available separately) can also be used to delete selected images.

Formatting the Camera Memory Card

Using *Nikon Capture*, you can format the card currently inserted in the camera. *Note that formatting the memory card permanently erases any images it may contain*. Be sure to back up any photographs you would like to keep before formatting the memory card.
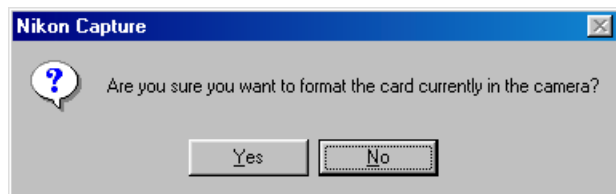
1 Select **Format Card in Camera** from the **Camera** menu.

2 Select **Yes** in the confirmation dialog that appears to format the memory card.

Accessing Memory Cards Directly

The memory card can be removed from the camera and used as a disk on your computer. Images stored on the card can be loaded into the camera image window or deleted using *Nikon Capture*. To use the card as a disk, you will need a Compact-Flash card reader or an EC-AD1 PC card adapter and a computer equipped with a PCMCIA Type II card slot.

Tip

While the memory card is mounted as a disk, any image files it may contain can be handled as you would any other file, without using *Nikon Capture*. Files can be opened, copied, or deleted in My Computer (Windows operating systems), the Windows Explorer, or the Macintosh Finder. You can also use *Nikon View DX* (available separately) to work with the images on the card. *Nikon Capture* is however required to handle RAW images, while YCbCr-TIFF images can only be read with *Nikon Capture* or *Nikon View DX*.

Mounting the Memory Card as a Disk

The steps below describe how to read memory cards using the EC-AD1 PC card adapter. For information on using a CompactFlash card reader, consult the manual provided by the manufacturer.

1 Remove the memory card from the D1 and insert it in the PC card adapter.
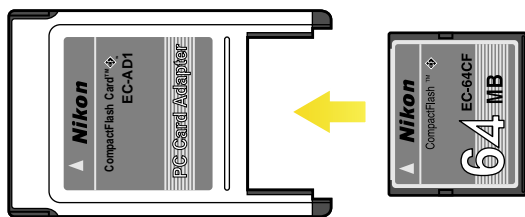
2 Insert the PC card adapter in your computer's PC card slot (see the manual provided with your computer for details).
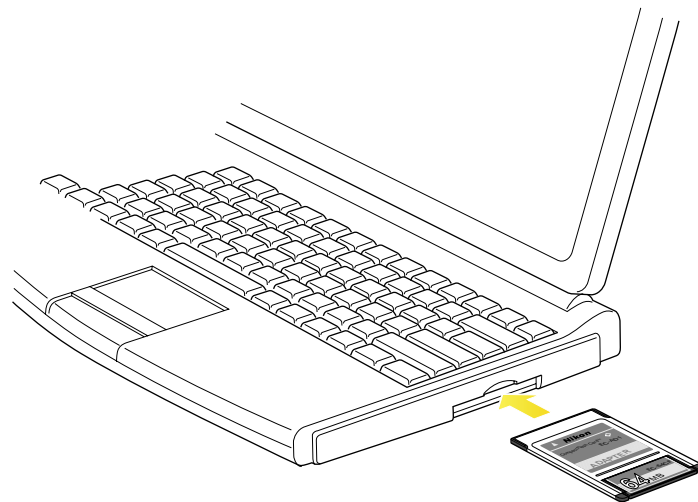
If the computer is on, the CompactFlash card will be mounted as a disk.

Note

Depending on your setup, it may be necessary to install drivers or register the card with your system before you can use it. See the documentation provided with your computer for details.

Reading Images from the Memory Card

1 Choose **Load Images from Card…** from the **File** menu.

2 In the dialog that appears, choose the folder containing the photographs you want to view and click **OK** (Windows) or **Select** (Macintosh). Images will be loaded from the card, and the most recent image will be displayed in the Preview section of the Camera Image window.
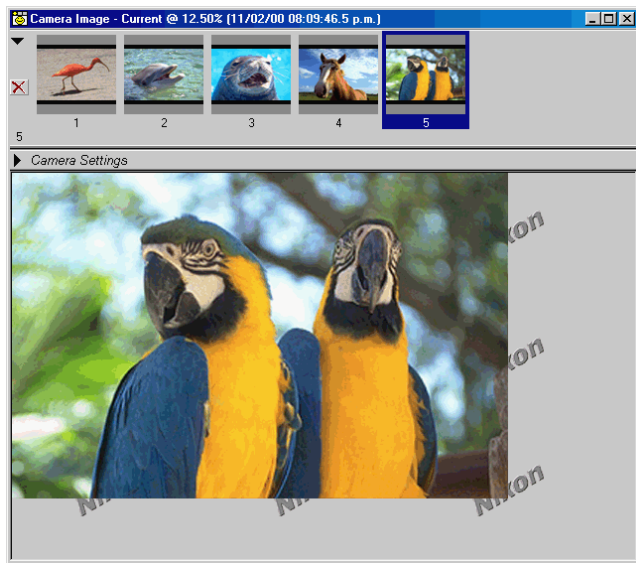
> **Macintosh Users Please Note:**
> Before using **Load Images from Card…** to load RAW images, open the **File Exchange** control panel to the PC Exchange tab and add an association linking the PC extension ".nef" with *Nikon Capture*'s NEF format. If you mount the memory card using *Nikon View DX* (available separately), the extension ".nef" will automatically be associated with *Nikon Capture*.
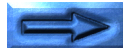
Deleting Images from the Card

1 Choose **Delete Images on Card…** from the **File** menu.

2 In the dialog that appears, choose the folder containing the photographs you want to delete and click **OK** (Windows) or **Select** (Macintosh).

3 In the confirmation dialog that appears click **Yes** to delete all images in the selected folder.
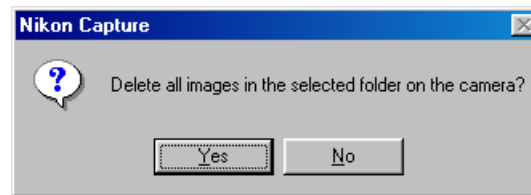
All images in the selected folder will be deleted.

> **Note**
> Once deleted from the memory card, images can not be recovered. Be sure to back up any images you would like to keep.

The Disk Space Indicator (Windows Only)

In the Windows version of *Nikon Capture*, an indicator showing the amount of space remaining on the volume or volumes used for storage of thumbnails and other temporary data is displayed at the bottom left corner of the Nikon Capture window.
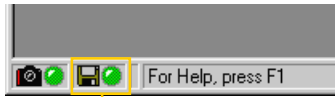
Disk space indicator

> ### Tip
> The color of the disk space indicator shows how much space is left on the drives (volumes) *Nikon Capture* uses to store images copied from the camera and other temporary data.
> 🟢 More than 200 MBs available on both the volume used for temporary storage and on the volume used to store thumbnails.
> 🟡 Less than 200 MBs remaining on one or both volumes.
> 🔴 Less than 100 MBs remaining on one or both volumes. Choose a different volume from the File Locations tab of the Preferences dialog, or free space by deleting unnecessary files.

Checking the Amount of Space Remaining

1 Click the disk space indicator. The following dialog will appear, showing the amount of space remaining on the volume or volumes containing the thumbnail folder and the folder for temporary items.
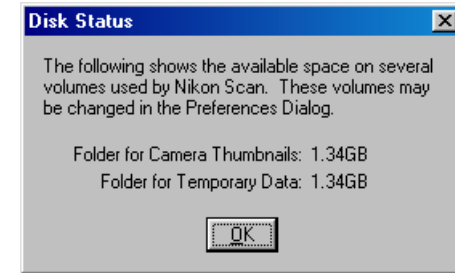
2 Click **OK** to close the dialog box.

Working with Images

Using *Nikon Capture*, you can perform a variety of operations on images that have been loaded into the Camera Image window before saving them to disk. You can also open for editing images that have previously been saved in the Nikon Electronic Image Format (NEF).

Image Windows

Images can be edited in the Camera Image window or in separate image windows.

CONCEPT

The Camera Image Window

In the Camera Image window, you can view thumbnail previews of the images transferred from the camera or memory card and display selected images for preview or editing.

Title bar   Thumbnail

Thumbnail section

Number of images

Camera Settings section

Preview section
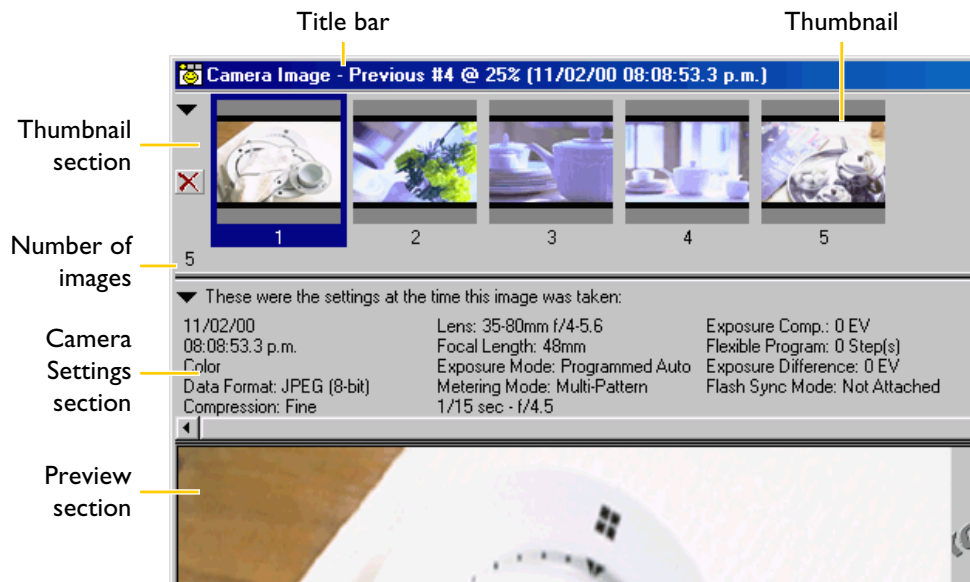
To open or close the Camera Image window, select **Camera Image** from the **View** menu (in the Windows version of the program, you can perform the same operation by clicking the button in the toolbar).

The Title Bar

The title bar gives information about the selected image.

Thumbnail index   If the most recent image is selected, the thumbnail index will show "Current." When the second most recent image is selected, the thumbnail index shows "Previous #1," when the third most recent image is selected, "Previous #2," and so on.

Zoom ratio   The amount the image in the Preview section is zoomed in or out. The zoom ratio reflects the number of pixels in the image and the resolution of the monitor rather than the physical dimensions of the image when printed.

Date and time   Depending on the option chosen in the Thumbnails tab of the Preferences dialog (see "Preferences: The Thumbnails Tab"), the title bar will show either the date and time the selected image was recorded or the thumbnail ID assigned by *Nikon Capture*.

Thumbnail Section

Thumbnail previews are displayed in order of recording.

Thumbnail   Click on a thumbnail to display the image in the Camera Image window. The number displayed below each thumbnail is the thumbnail ID assigned by *Nikon Capture*. This number can be reset to one in the Thumbnails tab of the Preferences dialog (see "Preferences: The Thumbnails Tab").

✕   Click to delete the selected image.

The Thumbnail section can be displayed or hidden by clicking the triangle at the top left corner, or by selecting **Thumbnail Section** from the **View** menu.

Tip

When the Thumbnail section is hidden…

…images can be deleted or selected for display in the Camera Image window.

Click to open the Thumbnail section   Number of images

Camera Image - Previous #4 @ 16.67% (11/02/00 08:08 53.3 p.m.)	
▶ Thumbnails (5)	✕ ⬅ ➡
▶ Camera Settings	
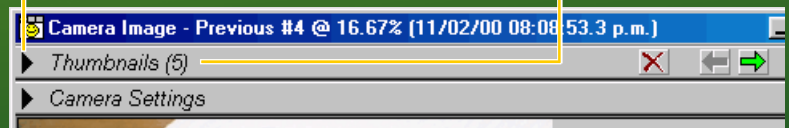
✕   Click to delete the image displayed in the Camera Image window.

⬅   Click to select the image recorded immediately prior to the image currently displayed in the Camera Image window.

➡   Click to select the image recorded immediately following the image currently displayed in the Camera Image window.

Camera Settings Section

The date and time of recording and the camera settings used to record the selected image are displayed in this area. The Camera Settings section can be displayed or hidden by clicking the triangle at the top left corner, or by selecting **Camera Settings Section** from the **View** menu.

Preview Section

The selected image is previewed in this area. Any changes made during editing are reflected in the preview image. No preview is displayed when more than one thumbnail is selected.

Image Windows

Images are opened in separate image windows when a copy is made of the image selected in the Camera Image window or when an image is opened by choosing **Open…** from the **File** menu. Images in image windows can be edited in the same way you would edit images in the Camera Image window. Any number of image windows can be opened simultaneously.

Title bar —

Camera Settings section —

Tip

Right-button menu (Windows)
Clicking on the Preview section, or on the image in an image window, with the right mouse button displays a menu of options identical to the **Image** menu.

Title Bar

The title bar provides the following image information:

PRACTICE

Source image ID If the image is a copy of a photograph in the Camera Image window, the source image ID shows the thumbnail ID of the original image. In the case of images read from a file, the file name is displayed (the Windows version of the program shows the full path name).

Zoom ratio The amount the image in the Preview section is zoomed in or out. The zoom ratio reflects the number of pixels in the image and the resolution of the monitor rather than the physical dimensions of the image when print-ed.

* (image not saved indicator)

This indicator appears in the title bar when the image has not been saved.

The Camera Settings section shows the same information as is displayed in the Camera Image window Camera Settings section (see "The Camera Image Window," above).

Creating a Copy of an Image

CONCEPT

Copies of images selected in the Thumbnails section of the Camera Image window can be opened in separate image windows.

To open a copy of the image in a separate image window, either:

- double-click a thumbnail in the Camera Image window, or
- select a thumbnail and either click the ![tool] tool button or choose **Create Copy** from the **File** menu.
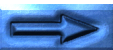
A copy of the image will be opened in a separate image window.

Although any changes to settings in effect at the time the copy was made will be reflected in the copy, subsequent changes made to the copy have no effect on the original image in the Camera Image window; similarly, changes to the original do not affect the copy. This makes it possible to apply one set of image enhancement operations to the copy and compare them with the effects of a different set of operations applied to the original.

If an image window is active, further copies of the image it contains are created when **Create Copy** is selected from the **File** menu or the tool button is clicked.

Opening an Image File

CONCEPT

Images saved in Nikon Electronic Image Format (NEF) using the **Save Original Image…** command can be opened in image windows within *Nikon Capture*. You can also open unedited images in JPEG, TIFF, and NEF format created with the D1.

Images saved using the **Save Final Image…** command can not be opened in *Nikon Capture*.

1 Select **Open…** from the **File** menu (in the Windows version of the program, files can also be opened by clicking the 🖻 tool button).

2 Navigate to the desired drive and folder.

3 Double-click on the file you wish to open. The image will be opened in an image window within *Nikon Capture*.

Tip

Opening files by drag and drop
Files can also be opened by dragging the file icon into the *Nikon Capture* window.

Opening files in a third-party application
By default, when you attempt to open a file which was not created by the D1, or which you have already edited and saved in JPEG or TIFF format, *Nikon Capture* will display a message stating that it can not open the file. If the **Open Final Image in External Application** box in the File Locations tab of the Preferences dialog is checked, however, *Nikon Capture* will instead display the message "Open file in external application?" allowing you to open the file in a specified program.

Selecting a Crop

CONCEPT

In an image window or the Preview section of the Camera Image window, you can select a portion of the image to be saved when **Save Selection Only** or **Crop and Scale** is chosen in the save dialog (if no selection is made, the entire image will be saved).

1 Select the ▣ tool button or choose **Crop Cursor** from the **View** menu. The mouse pointer will change to a crop cursor (+) when moved over the image in the active window.

2 Drag the mouse over the image to select a crop. Your selection will be marked by a dotted line.

Tip

Saving the crop to a separate file
When saving images, you can choose whether to save the entire image or only the portion in the current crop. In the Save Original Image dialog, check **Save Selection Only**. In the Save Final Image dialog, check **Crop and Scale**.

To Select the Entire Image…

…click outside the current crop or choose **Select Entire Image** from the **Image** menu. You can not select the entire image when **Keep My Output Size** is selected in the Size/Resolution window.

To Move the Crop…

…move the cursor over the crop, where the pointer will change to a 🖰 (Windows) or ✛ cursor (Macintosh). Drag the crop to move it over a different part of the image.

To Change the Size of the Crop…

…drag the edges or corners of the crop. The pointer will take the form of a double arrow.

Zoom

You can zoom the active window in or out using the 🔍 tool button or the zoom commands in the **View** menu (this does not affect the physical size of the image). The window title bar will show the zoom ratio.

To zoom the image in, either…

• …select the 🔍 tool or choose **Zoom Cursor** from the **View** menu, then click on the part of the image that is at the center of the area you want to zoom in (the zoom ratio will be further increased each time you click), or

• select **Zoom In** from the **View** menu.

To zoom the image out, either…

• …select the 🔍 tool or choose **Zoom Cursor** from the **View** menu and then, holding down the Ctrl key (Windows) or **option** key (Macintosh), click on the part of the image that is at the center of the area you want to zoom out (the zoom ratio will be further reduced each time you click), or

• select **Zoom Out** from the **View** menu.

Rotating and Flipping Images

Images in the active window can be rotated or flipped using the buttons in the toolbar or tool palette or the commands in the **Image** menu.

Rotating Images

Click the ↻ tool or select **90 degrees CW** from the **Rotate** submenu to rotate the image in the active window 90° to the right. Click the ↺ tool or select **90 degrees CCW** from the **Rotate** submenu to rotate the image in the active window 90° to the left.

Image
Select Entire Image   Ctrl+A
Flip   ▶
Rotate   ▶   180 degrees
                                                        90 degrees CW
Apply Curves   90 degrees CCW
✓ Apply Color Adjustment

Flipping Images

Use the commands in the **Flip** submenu to flip the image in the active image window horizontally or vertically.

Image
Select Entire Image   Ctrl+A
Flip   ▶   Horizontal
Rotate   ▶   Vertical
Apply Curves
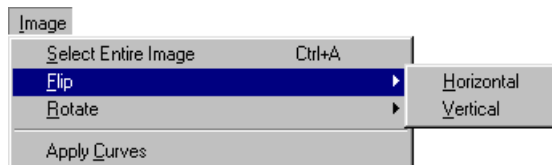
The Information Window

The Information window shows the position and color of the pixel under the mouse pointer.

To display or hide the Information window, select **Information** from the **View** menu.

Info   ✕
        x: 1512   R: 27/27
        y: 1016   G: 25/25
                            B: 12/12
                      Avg: 24/24
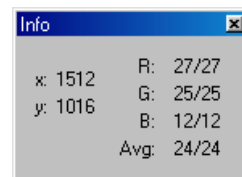
x-y coordinates   The position of the cursor in the image window, measured in pixels from the top left corner of the image.
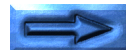
R, G, B, Avg   The values for each of the red, green, and blue elements of the pixel under the cursor and the average of the three, weighted according to the properties of human color perception (the formula for the weighted average is (Red × 0.299) + (Green × 0.587) + (Blue × 0.114)). Depending on the color space, the average may not reflect the actual luminance of the pixel under the cursor, but it can be used as a rough guide to brightness. Values range from 0 to 255, values for twelve-bit images being scaled to fit in this range. The number on the left shows the input value, or value for the color in the original image. The value on the right is the output value, or value after any changes made in the Curves or Color Adjustment windows have been applied.

The Bird's Eye Window

The Bird's Eye window shows the position of the part of the image that is visible in the active image window. This can be useful if only a portion of the image will fit in the window at the current zoom ratio, when the Bird's Eye window can be used to view different portions of the image without zooming the image out.

To display or hide the Bird's Eye window, select **Bird's Eye** from the **View** menu.
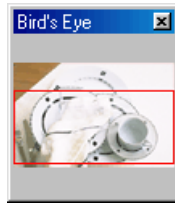
The portion of the image that is visible in the active window is indicated by a red outline.

Navigating to Other Areas of the Image

When the mouse pointer is moved over the red outline, it changes to a ⌖ cursor. Drag the red outline to cover an area of the image you would like to view. The active window will show the portion of the image inside the red outline.

> *Tip*
>
> **Changing the size of the Bird's Eye window**
> The size of the Bird's Eye window can be changed by dragging its borders (Windows) or by dragging the handle at the lower right corner of the window (Macintosh).

Image Adjustment

Before they will be ready for display or output on a monitor or printer, images captured from the camera will usually need to be adjusted to a size and resolution appropriate to the output device and the task at hand. Images may also need to be processed for enhanced contrast or sharpness or to achieve a color balance suited to your printer or monitor. In general, such image adjustment involves the following four processes:

Process	See
Select the portion of the image you want to work with.	"Working with Images: Selecting a Crop"
Adjust the size and resolution of the image for output on a particular device.	"Image Adjustment: Output Size and Resolution"
Adjust tone information, color balance, and contrast. There are two distinct tools for this task: the Curves window, which offers precise control over tones, and the Color Adjustment window, which features simpler controls.	"Image Adjustment: Curves" "Image Adjustment: Color Adjustment"
If the image still lacks sharpness, you can sharpen outlines using the controls in the Unsharp Mask window. Unsharp Mask settings should always be applied after changes to size, resolution, tone curves, color balance, brightness, and contrast.	"Image Adjustment: Unsharp Mask"

When the edited image is saved to disk using the **Save Final Image…** command, you can choose the color model (RGB or CMYK) and bit depth (eight or sixteen bits) for the final image (see "Saving Images"). If **Save Original Image…** is used, the image will be saved exactly as recorded by the camera. Any changes to curves, color balance, and other settings made after the image was recorded will be saved separately in the same file.

Output Size and Resolution

The Size/Resolution window is where you specify the final ("output") size of the portion of the image that will be captured when **Save Selection Only** or **Crop and Scale** is chosen from Save Original Image or Save Final Image dialog. The choice of settings in the Size/Resolution window depends on how you intend to use the image and the amount of storage space you have available. Some examples are given below.

If the image will be used in printing or desktop publishing…
…size and resolution will be dictated by the resolution of the output device and the physical size of the image when printed, measured in centimeters or points rather than pixels.

If you intend to use the image on a web page…
…specify output size in pixels, keeping file size to a minimum for rapid downloads. Resolution in this case is not an issue.

To adjust size and resolution:

1 Select **Size/Resolution** from the **View** menu (in Windows, you can also click the 🔼 tool button in the toolbar).
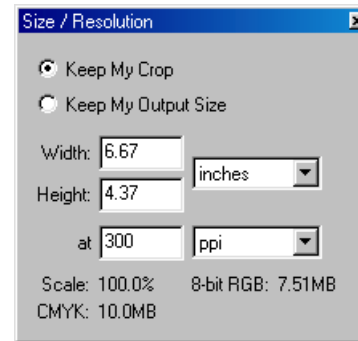
2 Make changes to the options described below.

Keep My Crop

When **Keep My Crop** is selected, you can use the mouse to adjust the size and position of the current crop as desired. If you enter a new value for height or width in the Size/Resolution window, the remaining dimension changes automatically to maintain a constant height-width aspect ratio, and scale is adjusted to reflect the new dimensions (scale can not be increased beyond 200%). If the image can not be output at the current resolution using the new dimensions, resolution will automatically be adjusted to an appropriate value. This option is useful when you want to specify height and width after selecting a crop.

Keep My Output Size

Keep My Output Size locks output dimensions and file size at their current values, setting the aspect ratio of the current crop according to the dimensions input in the Size/Resolution window. This height-width aspect ratio will be maintained when you adjust the size of the crop in the active window, and scale will be adjusted to reflect changes to the size of the crop (scale can not be increased beyond 200%). If the image can not be output at the current resolution using the new dimensions, resolution will automatically be adjusted to an appropriate value. This option is useful when you want to set the output dimensions and file size of the final image before selecting a crop.

> ### Tip
> To display the Size/Resolution window, select **Size/Resolution** from the **View** menu.
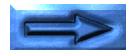
Width/Height

The output dimensions for the current crop can be entered in these text boxes. The units used to describe output dimensions can be chosen from the menu to the right of the text boxes (shown above at right).

inches	▼
pixels	
inches	
mm	
cm	
picas	
points	

At

The **At** text box is where you enter the output resolution. This text box is not active when the unit chosen for output size is "pixels." The value chosen at other settings should reflect the resolution of the output device on which the final image is to be printed. The units for resolution can be selected from the resolution menu (shown above at right), which offers a choice of pixels per inch (ppi) or pixels per centimeter (ppcm). The default resolution is 300 ppi.

ppi	▼
ppi	
ppcm	
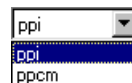
Scale/File Size

Scale is displayed at the bottom of the Size/Resolution window, together with the uncompressed file size of the image that would be created at current settings. File size depends on the color model (RGB or CMYK) and, in the case of RGB images, on the pixel bit-depth that will be used when the image is saved. Separate file sizes are shown for CMYK and for eight-bit and sixteen-bit RGB.
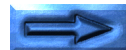
The Size/Resolution Settings Menu

The **Size/Resolution** submenu in the **Settings** menu can be used to save and recall size and resolution settings or to restore settings to initial or default values. The information saved includes the size and location of the current crop. The options available in the **Size/Resolution** submenu are detailed below.

```
Settings
  Camera Control      ▶
  Curves              ▶
  Color Adjustment    ▶
  Unsharp Mask        ▶
  Size / Resolution   ▶   Load...
                          Save...
                          Save as Default
                          Reset to Default
                          Reset to 100%
```

Load…

Select this item to load size and resolution settings previously saved using the **Save…** option (see below). The standard file open dialog for your operat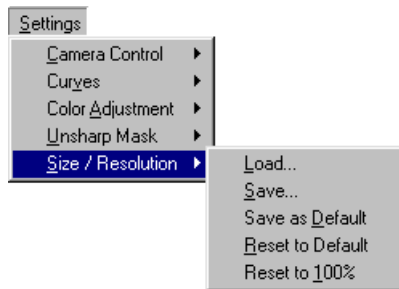ing system will be displayed; navigate to the drive (volume) and directory containing the desired settings and open the settings file (in Windows, only files with the extension "**.nsr**" will be displayed). The settings in the Size/Resolution window will instantly revert to the saved settings.

Save…

Select this item to save the resolution, size, and position of the current crop in a named file. These settings can later be recalled using the **Load…** option. Choosing **Save…** displays the standard file save dialog for your operating system. After navigating to the destination drive (volume) and folder, save the settings under the name of your choice (in Windows, size and resolution settings are saved with the extension "**.nsr**").

> ### *Tip*
> **Right-button menu (Windows)**
> The **Size/Resolution** submenu can be displayed by right-clicking in the Size/Resolution window.

Save as Default

Select this option to save the resolution, size, and position of the current crop as the defaults for size and resolution. These settings will be restored when **Reset to Default** is selected from the size/resolution settings menu. If **Use Default Settings** is selected for **Settings for Next Camera Image** in the General tab of the Preferences dialog, the default settings will also be restored whenever an image is captured. Only one set of default settings can exist at any one time; previous defaults are automatically overwritten when new default settings are created. Default settings are stored in the same folder as *Nikon Capture*.

Reset to Default

Selecting this item restores the settings in the Size/Resolution window to the defaults created using the **Save as Default** option. If no default settings exist, a crop that includes the entire image will be selected and scale will be restored to 100%.

Reset to 100%

When this item is selected, the crop will be enlarged to include the entire image and scale will be restored to 100%. Resolution will be restored to the default value of 300ppi (118.11ppcm).

Note

The units for size and resolution are not saved when **Save…** or **Save as Default** is chosen from the **Size/Resolution** submenu.

Curves

Although your Nikon digital camera will reproduce colors accurately if settings have been adjusted appropriately, it will usually be necessary to adjust contrast, tone (brightness) levels, and color balance to make maximum use of the tone range and color gamut offered by a particular output device, such as a printer or monitor. *Nikon Capture* offers two tools for performing these tasks: the Color Adjustment window (see "Color Adjustment" later in this chapter) and the Curves window. Of the two, the Curves window offers the more precise control. The Color Adjustment window is useful when, for example, you want to adjust brightness or color balance for all pixels in the image. This kind of adjustment may, however, result in loss of detail in portions of the tone range. The Curves window, in contrast, allows adjustments to be made to specific portions of the tone range, making it possible to enhance the image while preserving detail.

Note

Color adjustment and curves can not be used together. If the controls in the Curves window are active, the controls in the Color Adjustment window are disabled. If the Color Adjustment controls are active, the controls in the Curves window are disabled. Only one of color adjustment or curves can be applied when a modified image is saved.

Curves—an Overview

The main editing tool in the Curves window 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 red, green, and blue color components, or "channels." The default curve in each case is linear, meaning that tones will be output exactly as they are input.

Current channel

Curve edit display
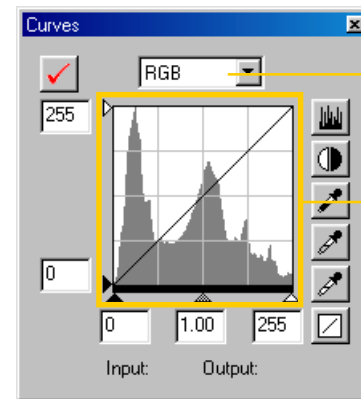
Tip

To open the Curves window, choose **Curves** from the **View** menu (in Windows, you can also click on the 🖌 tool button in the toolbar).
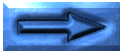
Input is plotted along the horizontal axis, with shadows (the dark areas of the image) to the left, highlights (the bright areas of the image) to the right, and mid-tones in between. The left end of the axis marks the minimum possible value for colors in the selected channel (zero, or no color), the 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 ma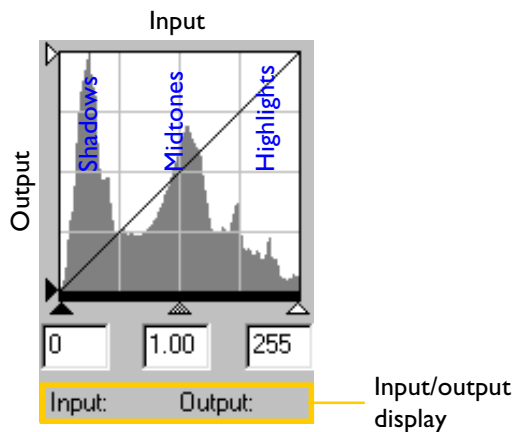ximum value represents areas that are a true white. Output is plotted along the vertical axis, with the minimum possible output value (again, zero, or no color) at the bottom and the maximum output value at the top.

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. The input value represents the level of the pixel in the original image, the output value the level of the pixel after any changes to the curve have been applied.

Input/output display

Note

Although values for input and output in the Curves window 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 modifications to twelve-bit RAW data to be performed without lowering the quality of the output.

Tip

Changes to curves are only possible when the Apply check-box at the top left of the Curves window is checked. When this box is checked, changes to curves will be visible in the image being edited. The box can be checked and unchecked for a quick "before-and-after" comparison, allowing you to see whether changes to curves are having the desired effect. The same effect can be achieved using the **Apply Curves** item in the **Image** menu.

Step 1—Viewing the Histogram

The first step in adjusting tone levels and color balance in the Curves window is to view the histogram displayed in the background of the curve edit display. The histogram tells you what tones are present in the original image and in what amounts, information that you will use when setting the black point and white point and editing curves. The histogram takes the form of a bar graph. The horizontal axis gives the tone level, 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 image, scaled to fit in the curve edit display.
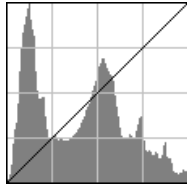
To view the distribution of tones in the final, output image after changes to curves, click and hold the histogram button ().

Step 2—Channel Selection

You can modify tones for all colors in the image using the master curve, or select any of the red, green, and blue curves for editing using the channel menu (see right). The histogram shows tone levels for the selected channel only. When the master curve is selected, the auto-contrast button and white-point and black-point eyedropper tools (see below) 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 the selected curve only.

Step 3—Setting the White Point and Black Point

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 causing a corresponding loss of detail in shadows. Similarly, if the original image does not actually contain shades corresponding 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 eye-dropper tools

Automatic Contrast Adjustment

In automatic contrast adjustment, *Nikon Capture* 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; see "Preferences," below). 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 auto contrast button (◑). The white and black points for each of the red, green, and blue channels will be modified simultaneously (the master curve is unaffected). 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.

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, match-ing 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
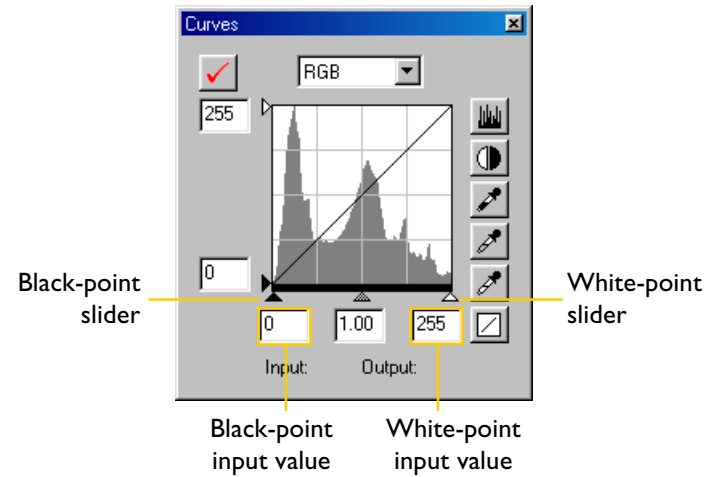
Sampling the Image for White Point or Black Point

The white point or black point can be set by directly sampling the image, allowing you 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 white-point 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 window to identify the pixel with the highest input value. 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 cursor will return to its original shape, and the image will automatically be altered to reflect the new value for white point.

To sample the image for the black point, click the black-point 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.

> ### Tip
> **Setting the white point/black point for the current channel**
> By default, sampling sets the white point or black point for all channels. To set the white point or black point for the current channel only, sample the image while holding down the **Ctrl** key (Windows) or **option** key (Macintosh) on the keyboard.
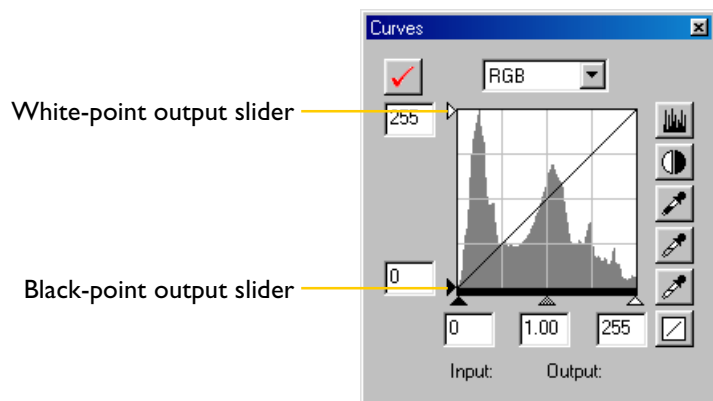
White Point and Black Point Output Levels

Once you have set the input level for the black point and white point, 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

Tip

Default values for the white-point and black-point output levels can be set in the Preferences dialog. See "Preferences."

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.
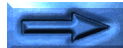
Step 4—Setting the Midpoint

The point midway between the maximum and minimum input values is known as the "midpoint," which represents a neutral shade corresponding to an output level of 128. The midpoint is controlled by a midpoint 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 midpoint slider or by directly sampling the image using the midpoint eyedropper tool.
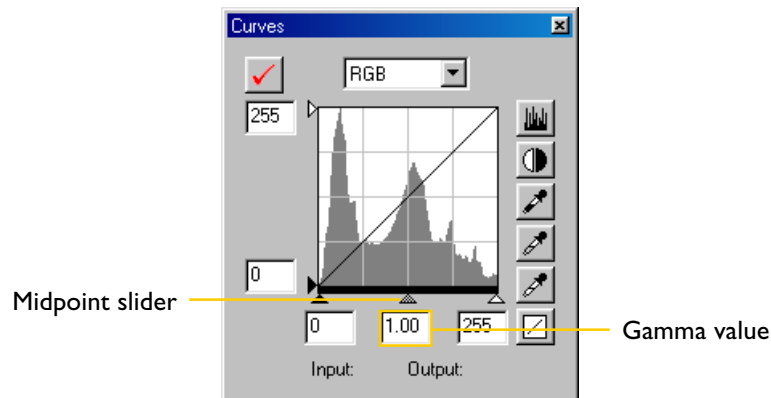
Gamma

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 0.05 and 6.00.

The Midpoint Slider

The midpoint slider is located at the bottom of the curve edit display.

Midpoint slider

Gamma value

After clicking the slider once to activate it, move it 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 midpoint can be seen in the active image.
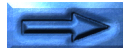
Sampling the Image for Midpoint

The midpoint can also be set by direct sampling. No matter what channel is currently selected in the channel menu, sampling simultaneously defines the midpoint for each of the red, green, and blue channels while leaving the midpoint for the master curve unchanged.

To sample the midpoint, click the midpoint 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 midpoint, keeping an eye on the pixel level display in the Information window to identify pixels with a neutral input value (look for pixels that you think should be a neutral gray color in the final image). With the cursor over the target pixel, click the mouse button. The input value for the selected pixel will be used as the reference value for the midpoint. The cursor will return to its original shape, and the image will automatically be altered to reflect the new value for midpoint.

Step 5—Editing Curves Directly

Fine adjustments can be made to brightness and contrast in specific portions of the tone range by adding additional points to the curves for each channel. These points can be freely adjusted by dragging them into new positions, changing the shape of the curve. Steepening the slope in a given portion of the curve will enhance detail in that portion of the tone range. Changing the curve so that input levels in a given portion of the tone range are mapped to higher output levels will brighten tones in the affected tone range; similarly, changing the curve to map input levels to lower output levels will darken tones in the affected range.

Adding New Points to the Curve

Move the cursor over the curve edit display and click once to enter curve edit mode. Move the cursor to the position where you would like to add a new point, then click. A new point will be added at this position and the curve will automatically be adjusted to pass through this point. The position of the point can be adjusted by dragging it to a new location within the curve edit display. The image in the active window will auto-matically 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 Curves to Linear

The default linear curve for all channels can be restored by clicking the ▱ button in the Curves window. To return only the active curve to linear, hold down the **Ctrl** (Windows) or **option** (Macintosh) key on the keyboard while clicking the ▱ button.

Tip

The Curves window can be resized by dragging its borders (Windows) or by dragging the handle at the lower right corner of the window (Macintosh). The curves edit display changes with the size of the window, allowing you to enlarge the display to a maximum of 256×256 pixels. At this size, each of the 256 points on the curve is represented by a separate pixel, granting maximum precision when editing curves.

The Curves Settings Menu

The **Curves** submenu in the **Settings** menu can be used to save and recall tone adjustment settings or to restore settings to initial or default values. The options available in the **Curves** submenu are detailed below.

Settings
Camera Control ▶
Curves ▶	Load...
Color Adjustment ▶	Save...
Unsharp Mask ▶	Save as Default
Size / Resolution ▶	Reset to Default
	Reset to Neutral

Load...
Select this item to load curves previously saved using the **Save...** option (see below). The standard file open dialog for your operating system will be displayed; navigate to the drive (volume) and directory containing the desired settings and open the settings file (in Windows, only files with the extension "**.ncv**" will be displayed). The settings in the Curves window will instantly revert to the saved settings.

Save...
Select this item to save curves for all channels to a named file. These settings can later be recalled using the **Load...** option. Choosing **Save...** displays the standard file save dialog for your operating system. After navigating to the destination drive (volume) and folder, save the settings under the name of your choice (in Windows, curves are saved with the extension "**.ncv**").

Tip

Right-button menu (Windows)
The **Curves** submenu can be displayed by right-clicking in the Curves window.

Save as Default

Select this option to save the current curves as the defaults for the Curves window. These curves will be restored when **Reset to Default** is selected from the curves settings menu. If **Use Default Settings** is selected for **Settings for Next Camera Image** in the General tab of the Preferences dialog, the default curves will also be restored whenever an image is captured. Only one set of default settings can exist at any one time; previous defaults are automatically overwritten when new default settings are created. Default settings are stored in the same directory as *Nikon Capture*.

Reset to Default

Selecting this item restores curves to the defaults created using the **Save as Default** option. If no default settings exist, all curves will be returned to linear.

Reset to Neutral

When this item is selected, all curves are returned to linear.

Color Adjustment

The Color Adjustment window offers simple controls for adjusting overall brightness, contrast, and color balance for the entire image. Unlike the controls in the Curves window, however, the Color Adjustment window does not allow you to make changes that affect only a portion of the tone range.

The controls available in the Color Adjustment window are detailed below.
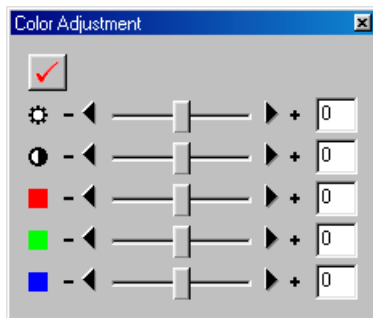
⚙ (Brightness)

The brightness slider adjusts brightness for the entire image. Dragging the brightness slider in the + direction brightens all the colors in the image, making the image as a whole more white. Dragging the slider in the – direction darkens all the colors in the image, making the image as a whole darker and less distinct. Unlike adjustments to the midpoint in the Curves window, this setting applies equally to shadows and highlights, producing a flat, low-contrast image. A value for brightness between –50 and +50 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 –50 and +50 can be entered in the text box to the right of the slider.

Note

Color adjustment and curves can not be used together. If the controls in the Curves window are active, the controls in the Color Adjustment window are disabled. If the Color Adjustment controls are active, the controls in the Curves window are disabled. Only one of color adjustment or curves can be applied when a modified image is saved.

Tip

To open the Color Adjustment window, choose **Color Adjustment** from the **View** menu (in Windows, you can also click on the 🔲 tool button in the toolbar).
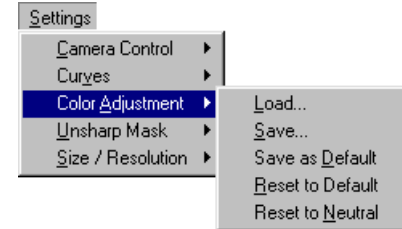
■ (Color Balance)

■ 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 directly in the text boxes to the right of the sliders.

Tip

Changes to brightness, contrast, and color balance are only possible when the Apply check-box at the top left of the Color Adjustment window is checked. When this box is checked, changes will be visible in the image being edited. The box can be checked and unchecked for a quick "before-and-after" comparison, allowing you to see whether color adjustment is having the desired effect. The same effect can be achieved using the **Apply Color Adjustment** item in the **Image** menu.

The Color Adjustment Settings Menu

The **Color Adjustment** submenu in the **Settings** menu can be used to save and recall color adjustment settings or to restore settings to initial or default values. The options available in the **Color Adjustment** submenu are detailed below.

Load…

Select this item to load brightness, contrast, and color balance settings previously saved using the **Save…** option (see below). The standard file open dialog for your operating system will be displayed; navigate to the drive (volume) and directory containing the desired settings and open the settings file (in Windows, only files with the extension "**.nca**" will be displayed). The settings in the Color Adjustment window will instantly revert to the saved settings.

Tip

Right-button menu (Windows)
The **Color Adjustment** submenu can be displayed by right-clicking in the Color Adjustment window.

Save…

Select this item to save brightness, contrast, and color balance settings in a named file. These settings can later be recalled using the **Load…** option. Choosing **Save…** displays the standard file save dialog for your operating system. After navigating to the destination drive (volume) and folder, save the settings under the name of your choice (in Windows, color adjustment settings are saved with the extension "**.nca**").

Save as Default

Select this option to save the current brightness, contrast, and color balance settings as the defaults for color adjustment. These settings will be restored when **Reset to Default** is selected from the color adjustment settings menu. If **Use Default Settings** is selected for **Settings for Next Camera Image** in the General tab of the Preferences dialog, the default settings will also be restored whenever an image is captured. Only one set of default settings can exist at any one time; previous defaults are automatically overwritten when new default settings are created. Default settings are stored in the same directory as *Nikon Capture*.

Reset to Default

Selecting this item restores brightness, contrast, and color balance settings to the defaults created using the **Save as Default** option. If no default settings exist, all settings will be returned to zero.

Reset to Neutral

When this item is selected, brightness, contrast, and color balance will be restored to zero.

Unsharp Mask

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

Intensity is the amount the contrast of edges will be increased. Too great an intensity will degrade your image rather than sharpening it.

Halo width controls the size of the areas that will be affected. The greater the halo width, the wider the edges in the sharpened image will appear. Too large a value for halo width will produce a "halo" along edges in the image.

Threshold defines 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 Unsharp Mask will be applied, with the result that only more distinctly contrasting edges will be affected.

Unsharp Mask can be applied to all the colors in the image or selectively to any combination of the red, green, and blue color channels. You can also control whether Unsharp Mask applies to all tones in the image or selectively to highlights, mid-tones, or shadows. The controls in the Unsharp Mask window allow you to select multiple combinations of color channels and tone ranges that can be sharpened to different degrees.

Creating Unsharp Masks

1 If the Unsharp Mask window is not already open, open the window by selecting **Unsharp Mask** from the **View** menu (in Windows, you can also click on the ⏸ tool button in the toolbar).

Tip

The amount of Unsharp Mask you will need depends on the size and resolution of the final image. The larger the image, the greater the amount of Unsharp Mask you will need to achieve the same degree of apparent sharpness. Before applying an Unsharp Mask, scale the image to the desired size and resolution. See "The Size/Resolution Window" in this chapter.

2 Select a combination of colors from the channel pop-up menu (A) and choose a tone range from the tone pop-up menu (B). The Unsharp Mask you create will be applied only to edges in the selected tone range and colors.
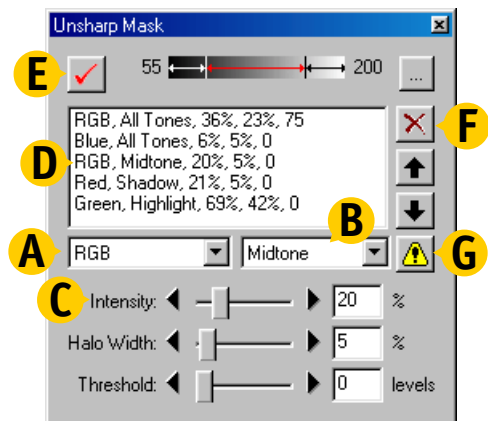
3 Select a value for intensity using the Intensity slider (C), or enter a value directly in the text box to the right of the slider. The selected combination of colors, tone range, and intensity will appear in the Unsharp Mask list (D). Entries in the list show, in order, the color, tone range, intensity, halo width, and threshold.

4 Select values for halo width and threshold. To compare the effects of the Unsharp Mask with the original image, click the Apply button (E) to turn Unsharp Mask on or off.

5 Repeat steps 1–4 to create additional unsharp masks for different color combinations and tone ranges. As new masks are created, they are added to the end of the Unsharp Mask list. Masks will apply in the order listed. To change the order in which the masks apply, select a mask in the Unsharp Mask list and click the up arrow to move it up in the list, or the down arrow to move it down. To delete an Unsharp Mask from the list, select it and click the delete button (F).

Tip

The warning button
The warning button (G) appears when the zoom factor of the image is too low to ensure that Unsharp Mask will have the desired effect. Clicking the button displays a warning.
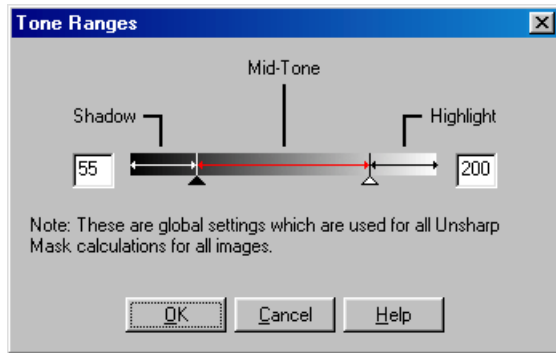

Tip

Unsharp Mask can only be used when the Apply button at the top left of the window is checked. When this button is checked, any unsharp masks will be applied immediately to the image being edited. The button can be checked and unchecked for a quick "before-and-after" comparison, allowing you to see whether Unsharp Mask is having the desired effect. The same effect can be achieved using the **Apply Unsharp Mask** item in the **Image** menu.

Defining Shadows, Mid-tones, and Highlights

To define the tone ranges affected by Unsharp Masks that apply to shadows, mid-tones, and highlights, click the (▣) button. The following dialog will be displayed.

Tone Ranges

Mid-Tone

Shadow   Highlight

`55`   `200`

Note: These are global settings which are used for all Unsharp Mask calculations for all images.
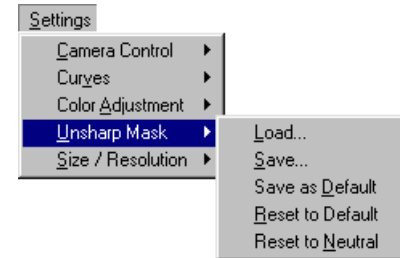
OK   Cancel   Help

The complete tone range, including shadows, mid-tones, and highlights, is mapped to values between zero (black) and 255 (white). To set the boundary between shadows and midtones, drag the shadow slider to the desired position, or enter a value directly in the text box to the left of the tone range display. The boundary between midtones and highlights is set by dragging the highlight slider or entering a value in the text box to the right of the display. These settings apply to Unsharp Mask calculations for all images.

The Unsharp Mask Settings Menu

The **Unsharp Mask** submenu in the **Settings** menu can be used to save and recall unsharp masks or to restore settings to initial or default values. The options available in the **Unsharp Mask** submenu are detailed below.

Settings
- Camera Control ▶
- Curves ▶
- Color Adjustment ▶
- Unsharp Mask ▶
  - Load...
  - Save...
  - Save as Default
  - Reset to Default
  - Reset to Neutral
- Size / Resolution ▶

Load...
Select this item to load unsharp masks previously saved using the **Save...** option (see below). The standard file open dialog for your operating system will be displayed; navigate to the drive (volume) and directory containing the desired settings and open the settings file (in Windows, only files with the extension "**.num**" will be displayed). The settings in the Unsharp Mask window will instantly revert to the saved settings.

> *Tip*
>
> **Right-button menu (Windows)**
> The **Unsharp Mask** submenu can be displayed by right-clicking in the Unsharp Mask window.

Save…

Select this item to save the current Unsharp Mask settings in a named file. These settings can later be recalled using the **Load…** option. Choosing **Save…** displays the standard file save dialog for your operating system. After navigating to the destination drive (volume) and folder, save the settings under the name of your choice (in Windows, unsharp masks are saved with the extension "**.num**").

Save as Default

Select this option to save the current Unsharp Mask settings as the default for Unsharp Mask. These settings will be restored when **Restore to Default** is selected from the Unsharp Mask settings menu. If **Use Default Settings** is selected for **Settings for Next Camera Image** in the General tab of the Preferences dialog, the default settings will also be restored whenever an image is captured. Only one set of default settings can exist at any one time; previous defaults are automatically overwritten when new default settings are created. Default settings are stored in the same directory as *Nikon Capture*.

Restore to Default

Selecting this item restores Unsharp Mask settings to the defaults created using the **Save as Default** option. If no default settings exist, all the unsharp masks displayed in the Unsharp Mask dialog will be deleted.

Restore to Neutral

When this item is selected, all the unsharp masks currently displayed in the Unsharp Mask dialog are deleted. The settings in the tone range dialog are not affected.

Saving Images

Nikon Capture supports a variety of image file formats. Images loaded from the camera can be saved in a format suited to the task at hand. For information on choosing an appropriate file format, see "File Formats," below.

NEF, YCbCr TIFF

NEF
The sixteen-bit NEF format is used to save "raw," unmodified twelve-bit image data from the CCD when shooting at an image quality of HI-RAW. This file type can only be read using *Nikon Capture*.

YCbCr TIFF
Photographs taken at an image quality of HI-YCbCr are saved in an uncompressed TIFF format that models color using measures of luminance (Y) and chrominance (Cb, Cr). This file type can be read using *Nikon View DX* or *Nikon Capture*.

File Formats

File Format and Image Quality

The relationship between the camera image quality setting and the file format used by the camera is shown in the following table:

Image Quality Setting	Camera File Format	Compression	Image Quality
HI-RAW	NEF (Nikon Electronic Image Format)	Uncompressed	High
HI-RGB TIFF HI-YCbCr TIFF	TIFF	Uncompressed	
FINE	JPEG (DCF†)	Low	
NORMAL		Medium	
BASIC		High	Low

When saving images captured from the camera, choose a file type that reflects the format used in the camera. The image quality of photographs that have been compressed by the camera will not improve if the images are saved in uncompressed form using *Nikon Capture*. When a JPEG-compressed image is saved in TIFF format, for example, image quality will be more or less the same as the original JPEG image.

† DCF (Design rule for Camera File systems): an industry-wide standard for digital camera file systems.

Saving Image Files

Nikon Capture offers two options for saving files: saving in *Nikon Capture*'s NEF format, and saving in standard image file formats.

Save Original Image…
Choose this option to save RAW images in the Nikon Electronic Image Format (NEF) directly to disk as NEF files, without changing the file format (NEF images have the extension "**.nef**"). Files saved in NEF format can only be opened with *Nikon Capture*. If the file was originally a JPEG or TIFF image created with the camera, it will be saved in eight-bit, uncompressed RGB format, unmodified for any changes to settings made in *Nikon Capture*.

Images saved in NEF format maintain the high image quality of the original photograph; image enhancement settings (Curves, Color Adjustment, Unsharp Mask, and output size and resolution) are not applied, but are saved separately in the same file. These images can later be opened in *Nikon Capture* and converted to a format that can be read by other applications using the **Save Final Image…** command. Image enhancement settings are applied when **Save Final Image…** is used, allowing you to create copies of the image that preserve most of the details in the original photograph even when image enhancement is used. Save images in NEF format using the **Save Original Image…** command when you are unsure of how they will be used or when you want to save an image that will later be processed in a number of different ways.

Save Final Image…

This option is used to save files in a format that can be read by other applications. The following file types are available:

File Type	Compression	Extension
16-bit TIFF (RGB) 8-bit TIFF (RGB)	Uncompressed	.TIF
TIFF (CMYK)	Uncompressed	.TIF
JPEG (EXIF-compliant)	Compressed	.JPG
JPEG (JFIF-compliant)	Compressed	.JPG
BMP (Windows only)	Uncompressed	.BMP
PICT (Macintosh only)	Choice of compressed or uncompressed	.PIC

The file type selected depends on how the image will be used:

TIFF Use TIFF when saving images for high-quality output or publishing. Although the lack of compression will result in larger files, a high level of image quality will be maintained. This file type is supported by a wide variety of applications on a variety of computer platforms.

JPEG This file type is adequate for images that will be output at low resolution or distributed in electronic form. Compression allows 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. Save files at the lowest compression ratio possible; if necessary, you can always save them again later at a higher compression ratio.

BMP This is the generic format used on Windows systems, and is available only in the Windows version of *Nikon Capture*. Most Windows users will be able to view files of this type.

PICT This is the generic format used on the Macintosh, and is available only in the Macintosh version of *Nikon Capture*. Unlike BMP, PICT supports compression. Most Macintosh users will be able to view files of this type.

Save Original Image…

This section describes how to save images in Nikon Electronic Image Format (NEF). NEF files can only be opened in *Nikon Capture*. Curves, Color Adjustment, Unsharp Mask, and output size and resolution settings do not apply to images saved in NEF format, but are saved separately in the same file.

1 Select **Save Original Image…** from the **File** menu (or, in the Windows version of the program, click the 🎞 tool button). A dialog like that shown below will appear.
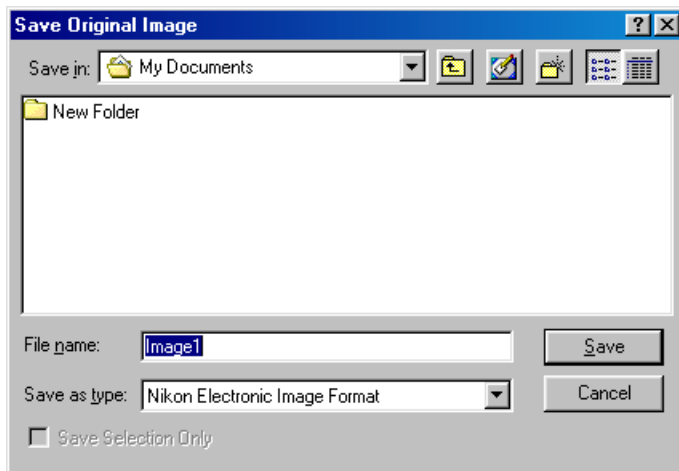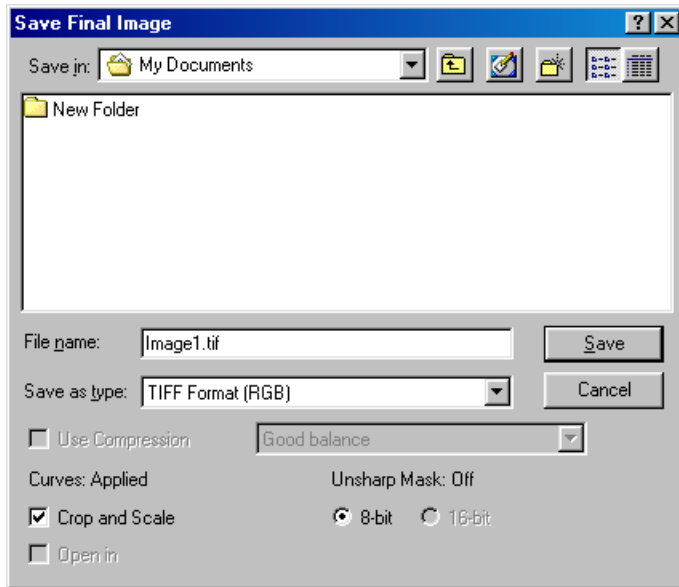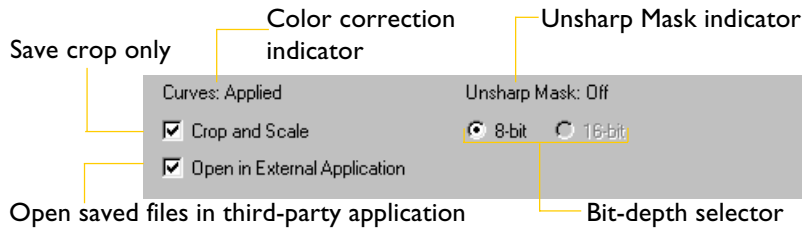

2 Navigate to the desired drive and folder.

3 If desired, enter a name for the file. If no name is entered, the file will be saved under a default file name.

4 To save only the portion of the image in the current crop, check **Save Selection Only**. If this box is not checked, the entire image will be saved.

5 Click the **Save** button to save the file under the specified name.

Save Final Image…

This section details how to save selected images in a format that can be read by other applications. Files saved using the **Save Final Image…** option can not be reopened in *Nikon Capture*.

1 Select **Save Final Image…** from the **File** menu (or, in the Windows version of the program, click the 🖫 tool button). A dialog like that shown below will appear.

2 Navigate to the desired drive and folder.

3 Choose a file type (file format) from the pop-up menu. See "File Formats," above, for details.

4 If the selected file type is PICT (only available in the Macintosh version of the program), you can choose whether or not to compress the image. The image will be compressed when **Use Compression** is checked.

3 If you have chosen a file type that supports compression (PICT or JPEG), you can choose a compression ratio from "Highest Compression Ratio," "Good Compression Ratio," "Good Balance," "High Quality," and "Excellent Quality."

6 If desired, enter a name for the file. If no name is entered, the file will be saved under a default file name.

7 Click the **Save** button to save the file under the specified name.

Save Options

In addition to the settings listed above, the following options are available in the **Save Final Image…** dialog:

Save crop only

Color correction indicator

Unsharp Mask indicator

Curves: Applied   Unsharp Mask: Off
☑ Crop and Scale   ⦿ 8-bit   ○ 16-bit
☑ Open in External Application

Open saved files in third-party application

Bit-depth selector

Color Correction

Shows whether Curves or Color Adjustment will be applied when the image is saved.

Curves: Applied

This appears when the checkbox in the Curves window is on when **Save Final Image…** is selected. Curves will be applied to the saved image; Color Adjustment will not.

Color Adjustment: Applied

This appears when the checkbox in the Color Adjustment window is on when **Save Final Image…** is selected. Color Adjustment will be applied to the saved image; Curves will not.

No Color Correction

This appears when neither Curves nor Color Adjustment is checked when **Save Final Image…** is selected. The saved image will not be modified for tone curves or color adjustment.

Unsharp Mask

Shows whether the settings in the Unsharp Mask window will be applied to the saved image.

Crop and Scale

Check this box to save only the portion of the image in the current crop. The image will be saved at the output size and resolution specified in the Size/Resolution window.

Pixel Bit-Depth

Shows the pixel bit-depth at which the image will be saved. **16-bit** will only be available if the format selected is **TIFF (RGB)** and if the image was originally taken at an image quality setting of HI-RAW (12 bit). At other settings, bit-depth is restricted to **8-bit**.

Open in

Shows the application (for example, *Photoshop* 5.0) specified in the **Open Final Image in External Application** area of the File Locations tab of the Preferences dialog. If this check box is on, the image will automatically be opened in the specified application after it has been saved.

Saving Multiple Images

This section describes how to save multiple images simultaneously using either **Save Original Image…** or **Save Final Image…**.

1 In the Camera Image window, select the thumbnails of the images you want to save, then choose **Save Original Image…** or **Save Final Image…** from the **File** menu. A dialog like that shown below will appear (the dialog below is that which appears in the Windows version of the program when **Save Original Image…** is selected).
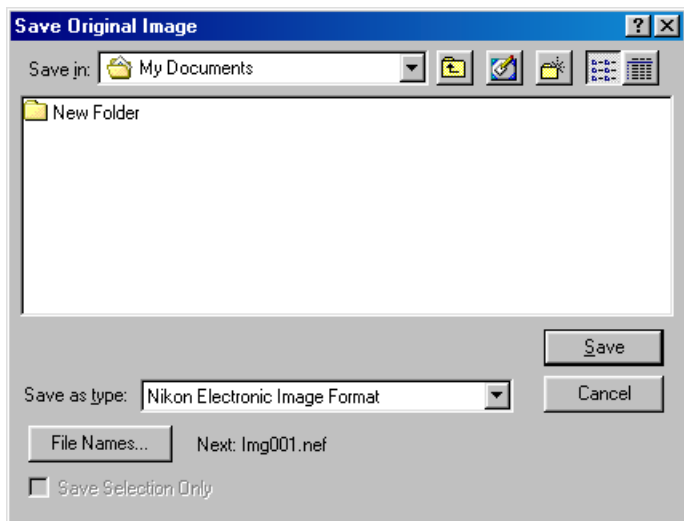
2 Click the **File Names…** button. The following dialog will be displayed.
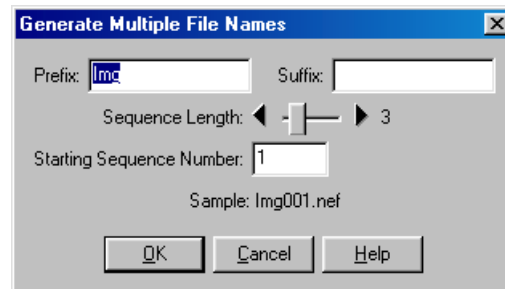
3 Enter a prefix, suffix, sequence length, and starting sequence start number, referring to the **Sample** area for an example of how the final file names will appear at current settings.

Prefix/Suffix

Enter the prefix and/or suffix of your choice (up to forty letters each; in the case of the Macintosh, however, the total length can not exceed thirty-one characters).

Sequence Length

Using the slider, choose the number of digits to be used in the sequential file number. File numbers can be from two to eight digits long.

Starting Sequence Number

Image files will be assigned sequential file numbers in ascending order, starting from this number.

4 Click **OK** to return to the save dialog.

5 Choose a destination folder and set other options as described in the preceding sections; then click the **Save** button to save the images to the specified location.


Note

File Naming Conventions

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

Windows: *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 "|".

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 "|".

Saving Photographs Directly to Disk

Using the Auto Save function, photographs can be saved directly to disk as they are taken, without being displayed in the Camera Image window. Photographs can be processed according to specified settings before being saved in the folder designated by the user. Images saved in Nikon Electronic Image Format (NEF) can afterward be opened for editing in *Nikon Capture*.

1 Select **Auto Save** from the **Camera** menu to display the Auto Save dialog.

Note

The Camera Control window can not be used to take photographs while Auto Save is in effect. Photographs can only be taken using the camera's shutter-release button.
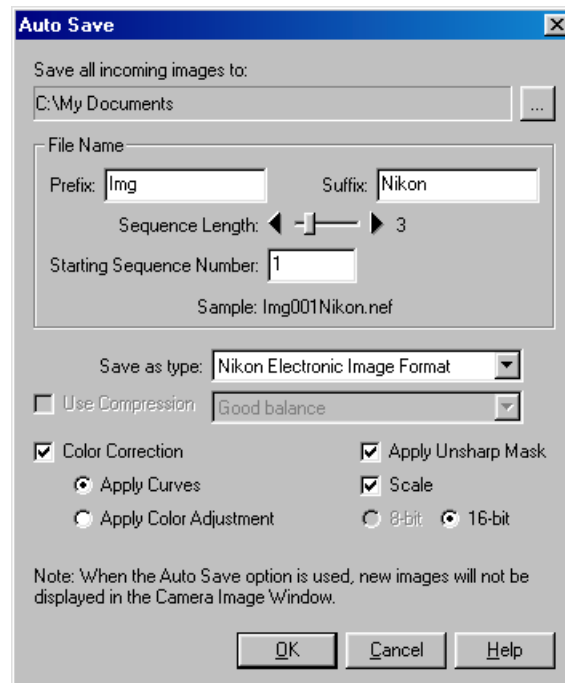
Tip

Before saving photographs with Auto Save, you will need to decide what settings you will use to process the images as they are saved. These settings will apply to all photographs taken while Auto Save is in effect. If you want to edit each image separately, capture the images one at a time into the Camera Image window and adjust settings for each image.

2 The path in which photographs will be saved is shown under **Save all incoming images to…**. Click the ☐ icon (Windows) or **Choose…** button (Macintosh) to select a different folder.

3 In the File Name panel, enter the prefix and suffix that will be used in naming files created with Auto Save. File names are distinguished by numbers assigned sequentially in ascending order; choose the number of digits (sequence length) and the starting sequence number.

Prefix/Suffix
Enter the prefix and/or suffix of your choice (up to forty letters each; in the case of the Macintosh, however, the total length can not exceed thirty-one characters).

Sequence Length
Choose the number of digits to be used in the sequential file number using the slider. File numbers can be from two to eight digits.

Starting Sequence Number
Photographs saved using Auto Save will be assigned sequential file numbers in ascending order, starting from this number.

4 Choose a file type from the **Save as Type** menu (see "Saving Images: File Formats").

5 If the selected file type is PICT, you can choose whether or not the file will be compressed (Macintosh only).

6 If the selected file type is JPEG or compressed PICT, choose a compression setting from the menu to the right of the **Use Compression** check box.

Note

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

Windows: *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 "|".

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 "|".

7 Specify the image enhancement settings that will be applied to photographs as they are saved.

Color Correction

Check this box to apply one of the following to photographs captured using Auto Save:

Apply Curves

Photographs are modified according to the settings in effect in the Curves window.

Apply Color Adjustment

Photographs are modified according to the settings in effect in the Color Adjustment window.

Apply Unsharp Mask

When this box is checked, photographs are modified according to the settings in effect in the Unsharp Mask window.

Scale

Photographs are saved at the resolution and scale specified in the Size/Resolution window.

Pixel Bit-Depth

Choose a pixel bit-depth of eight bits (256 tone levels) or sixteen bits (approximately 32,000 tone levels). The options available for pixel bit depth depend on the file type chosen in the **Save as Type** menu.

8 Click **OK**. While Auto Save is in effect, the Auto Save Mode Active dialog will be displayed.
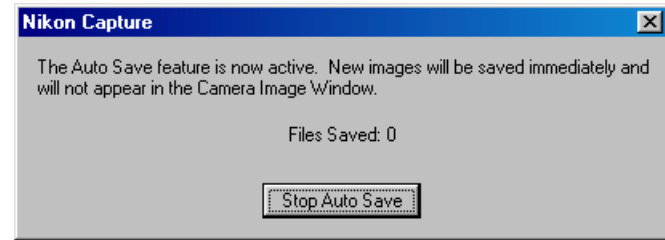
No other operations can be performed until **Stop Auto Save** is clicked to end Auto Save.

9 Take photographs using the camera. Photographs will be saved directly to the specified folder. The number of photos taken will appear in the Auto Save Mode Active dialog.

10 When you finish shooting, click **Stop Auto Save** in the Auto Save Mode Active dialog to end Auto Save.

Notes

If an invalid file name or other error is identified when the **OK** button is clicked to start Auto Save, a message will be displayed. Return to the Auto Save dialog and adjust settings as the message directs.

If an error occurs while Auto Save is active, an error log window will be displayed when Auto Save ends, showing the time of occurrence and the result of the error. Click **OK** to close the error log window.

Camera Operation

When the D1 is connected to a Windows or Macintosh computer via its IEEE 1394 interface, *Nikon Capture*'s Camera Control and Custom Settings windows give the user control over the majority of camera settings.
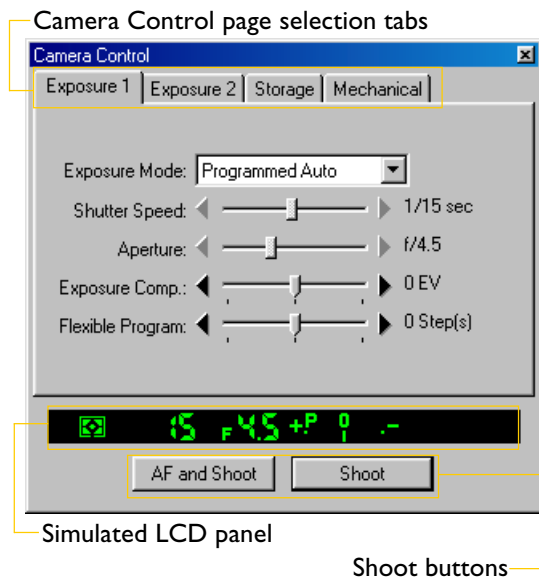
Camera Control

To adjust camera settings from the Camera Control window, choose **Camera Control** from the **View** menu, or click on the Nikon Capture camera tool button (📷) in the toolbar (Windows) or tool palette (Macintosh).

Camera Control page selection tabs

Simulated LCD panel

Shoot buttons

Note

Changes made to settings in the Camera Control window only apply to photographs taken after the changes are made, not to photographs that have already been taken.

Page Selection Tabs

The Camera Control window has four tabs: Exposure 1, Exposure 2, Storage, and Mechanical, which may be opened by clicking on the tab name.

Simulated LCD Panel

At the bottom of the window is a simulated LCD panel which shows the same information as that displayed in the camera's viewfinder, with the exception of camera errors. You can also use the simulated LCD panel to choose the setting you want to change by clicking on that area in the panel. When you click on a particular user-adjustable area, the corresponding tab sheet opens in the Camera Control window.

Shoot Buttons

Beneath the simulated LCD panel are the **AF and Shoot** (autofocus and shoot) button and the **Shoot** button, either of which can be selected to take a photo after the settings have been adjusted. The **Shoot** button is the button you will probably use most often. Use the **AF and Shoot** button when autofocus is not activated, but you want the camera to autofocus before releasing the shutter (note that an autofocus operation will not be performed when the camera is in manual focus mode). If the focus mode is single-servo AF, the camera will focus before releasing the shutter even when the **Shoot** button is pressed.

Tip

Some camera settings can not be adjusted using *Nikon Capture.* Follow the instructions in the D1 *User's Manual* when you want to:
  • take consecutive photographs in continuous shooting mode
  • use continuous servo autofocus
  • lock shutter speed, aperture, or autoexposure
  • use autofocus lock
  • use autofocus to check focus without taking a photograph
  • adjust aperture manually using the lens aperture ring
  • wake the camera up from sleep mode
  • use capture preview, record-and-review, or autobracketing
The following settings are displayed in the Camera Control window but can not be adjusted using *Nikon Capture*:
  • focus mode
  • metering

Tip

"Continuous shooting" and "single-frame shooting" in PC mode
In PC mode, you can choose between continuous and single-frame shooting using Custom Setting item 30 (see "Custom Settings" in the camera *User's Manual*). In continuous shooting mode, photographs will be taken one after another as long as the shutter-release button on the camera is held down. The **Shoot** and **AF and Shoot** buttons in the Camera Control window function as they do in single-frame shooting mode, with one photograph being taken each time either button is clicked.

Exposure 1
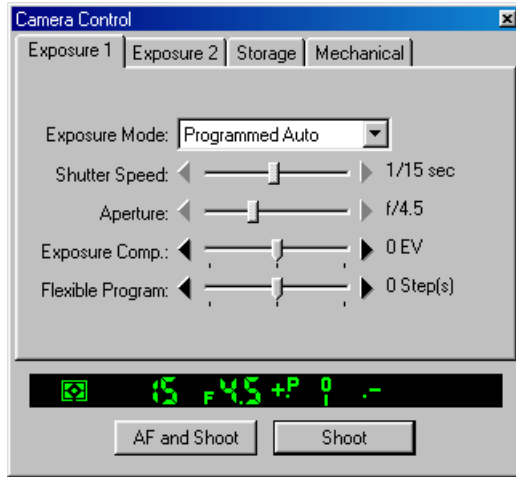
From the Exposure 1 tab, changes can be made to the following settings:

The following four options are available:

Manual

User controls both aperture and shutter speed.

Aperture Priority

User sets the aperture and the camera automatically adjusts the shutter speed. This setting is useful when you want to give priority to depth of field: small apertures can bring background and foreground into focus, while wide apertures can be used to blur the background.

Speed Priority

User sets the shutter speed and the camera automatically adjusts the aperture. High shutter speeds can be used to freeze motion, while low shutter speeds can blur moving objects.

Programmed Auto

User can select combinations of aperture and shutter speed pre-programmed into the camera for various lighting conditions.

Shutter Speed:

Shutter speed can only be adjusted in **Manual** and **Speed Priority** modes, when it can be set to values between **Bulb** and $^1/_{16,000}$ sec. ($^1/_{500}$ sec. when using a Speedlight). At a setting of **Bulb**, the shutter remains open for as long as the shutter-release button is held down.

Aperture:

Aperture can only be adjusted in **Manual** and **Aperture Priority** modes, when it can be set to values between f/4.0 and f/22.0 (small apertures have high f-numbers, wide apertures low f-numbers; the actual apertures available depend on the lens used). Aperture can not be controlled from *Nikon Capture* when Custom Setting 22 has been set to allow aperture to be adjusted manually using the lens aperture ring.

Exposure Compensation:

Exposure compensation is useful when shooting subjects containing sharp lighting contrasts, or on other occasions when you want to modify the exposure value determined by the camera. Exposure compensation can be set to values between –5EV and +5EV (in increments of 1 EV, $^1/_2$ EV, or $^1/_3$ EV, as specified in Custom Setting12). Exposure compensation is available in all exposure modes.

Flexible Program:

Flexible program can only be used in **Program Mode**, when it allows you to choose from predetermined combinations of shutter speed and aperture appropriate to current lighting conditions. Twenty-one steps from –10 to +10 are available (one step may be equivalent to 1 EV $^1/_2$ EV or $^1/_3$ EV, depending on the option chosen for Custom Setting 12).

Tip

When you attach a Speedlight to the camera, **Shutter Speed** can be set to values from **Bulb** to $^1/_{500}$ sec or $^1/_{250}$ sec.

Because the **Bulb** setting requires that the shutter-release button be held down, you must use the shutter-release button on the camera to take photos at this setting. The shutter-release button can not be held down in *Nikon Capture*.
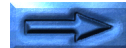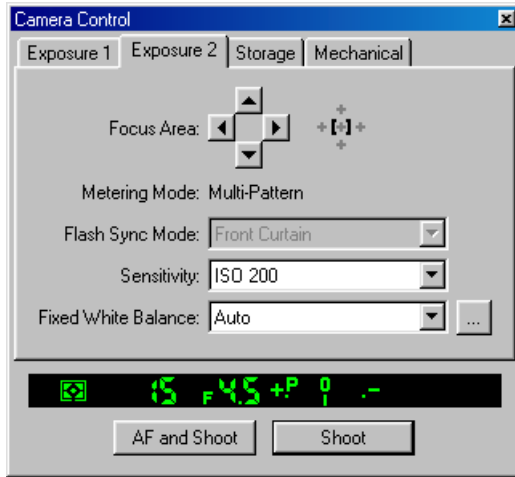
Exposure 2

From the Exposure 2 tab, changes can be made to the following settings:

Focus Area:

The focus area can not be selected at an AF area mode setting of **Closest Subject Priority** (see "Camera Operation: Custom Settings"). At other autofocus settings, the focus area can be selected using the arrow buttons. With the AF Area mode set to **Single Area AF**, the user may select one of five focus sensors, which the camera will use to determine the autofocus target. In **Dynamic AF**, the user designates the primary sensor, then, if the target moves, dynamic autofocus automatically shifts sensors to track the subject, keeping it focused. The plus pattern displayed to the right of the arrows indicates the active sensor.

Note

See the **Mechanical** page later in this chapter for information on AF area mode and focus mode settings.

Metering Mode

The camera's metering mode setting is displayed; however, adjustments to the metering mode can not be made from *Nikon Capture*. The following three settings are available using the camera's metering selector:

Multi-Pattern

Metering is performed by a CCD sensor with 1,005 (67 vertical × 15 horizontal) metering pixels, which sets exposure using a selection of data from all areas of the frame. This system is particularly effective with brightly-colored (white or yellow) or dark-colored (black or dark green) subjects that occupy a substantial portion of the frame, producing photographs closer to what is seen by the naked eye.

Center-Weighted

The camera measures light in the entire frame, but assigns the greatest weight to a circular area in the center of the viewfinder 8mm (0.31″) in diameter (the size of the area can be changed using Custom Setting 14). This setting can be used to preserve background details while letting lighting conditions at the center of the frame define exposure.

Spot

The camera measures light only in a 4mm circle (0.15″) centered on the current focus area. This setting is useful with backlit subjects or on other occasions when the background is much darker or much brighter than your subject.

Flash Sync Mode:

When taking photographs with a Speedlight, you can choose a flash setting from the following options:

Front Curtain

This mode is recommended in most situations. When using the SB-26, SB-25, or SB-24, set the sync-mode selector on the Speedlight to NORMAL.

Rear Curtain

Use this mode to suggest motion by creating a stream of light that appears to follow moving objects. When this mode is combined with programmed auto or aperture-priority auto, shutter speed is slowed to achieve the same effect as slow sync. When using the SB-26, SB-25, or SB-24, set the Speedlight's sync mode selector to REAR.

Slow Sync

A lower shutter speed is used in programmed auto and aperture-priority auto exposure modes to bring out background details.

Red Eye Reduction

In this mode, a red-eye reduction pre-flash lights for approximately one second before the main flash, causing the pupils in your subjects' eyes to contract and reducing the "red-eye" effect a flash can sometimes cause.

Red Eye Slow

This mode combines red-eye reduction with slow sync (available only with SB-28DX, SB-28, SB-27, and SB-26). Set the exposure mode to programmed auto or aperture-priority auto.

Tip

When shooting in low light conditions, or when shutter speed is slowed, use of a tripod is recommended to prevent blurring caused by camera shake.
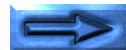
Sensitivity

Sensitivity (ISO equivalency) can be set higher than the default setting (ISO 200 equivalent) when taking photographs in low light conditions. By default, four settings (ISO 200, 400, 800, and 1,600 equivalent) are available; sensitivity can be increased by +1 or +2 EV over ISO 1,600 equivalent using Custom Setting 31 (see the camera *User's Manual* for details).

Fixed White Balance

White balance is used to ensure that colors which appear white when viewed directly are white in the final photograph. The following settings are available:

Auto	The 1,005-pixel CCD adjusts white balance automatically.
Preset	White balance can be set using a white object as a reference point.
Direct Sunlight	Use this setting when taking photographs in direct sunlight.
Shade	Use this setting when taking photographs in the shade in sunny weather.
Overcast	Use this setting when taking photographs under overcast skies.
Incandescent	Use this setting when taking photographs indoors under incandescent light.
Fluorescent	Use this setting when taking photographs indoors under fluorescent light.
Flash	Use this setting with Nikon Speedlights.

Note

Fixed White Balance Adjustment (following) can be used to help compensate for unusual crossover lighting or to produce an intentionally unbalanced rendering of a scene.

Fixed White Balance Adjustment

Click the ▣ button (Windows) or the **Choose…** button (Macintosh) to make fine adjustments to the white balance settings chosen in the white-balance pop-up menu. White balance can be adjusted from –3 to +3 in increments of 1.
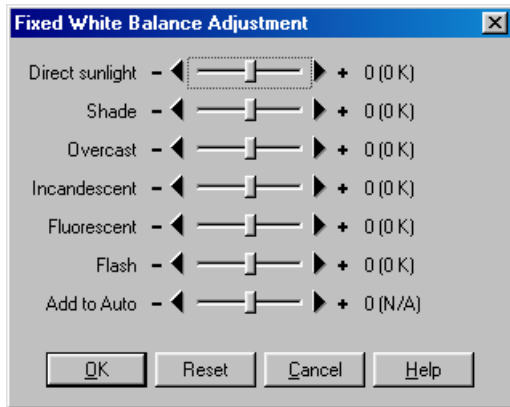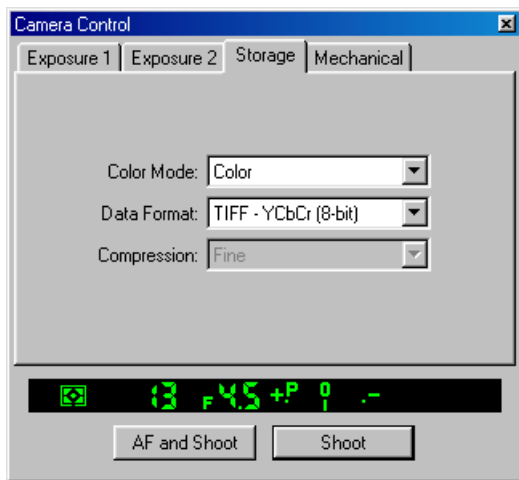

Adjustments made using the sliders apply to the associated white balance setting. Clicking the **Reset** button returns all values to defaults. Click **OK** to apply the current settings to the camera, or click **Cancel** to discard any changes and return to the Camera Control window.

<u>Storage</u>

From the Storage tab, changes can be made to the following settings:

Color Mode
Color mode can only be adjusted at a pixel bit depth (data format) of eight bits, when the user can choose from **Color** and **Black and White**.

> #### Note
> File size, memory, and hard disk requirements are the same for color and for black-and-white images.
>
> Uncompressed images range in size from approximately 4 MB to 7.8 MB. While file size can be reduced using compression, compressed images may show some loss in image quality.

Data Format
Data formats of **RAW (16-bit)**, **TIFF-RGB (8-bit)**, **TIFF-YCbCr (8-bit)**, and **JPEG (8-bit)** are available (because black-and-white is not available when shooting RAW images, the **Color Mode** menu is disabled at a setting of **RAW (16-bit)**).

Compression
At a Data Format setting of JPEG (8-bits), you can set image quality (JPEG compression) to **FINE**, **NORMAL**, or **BASIC**.

> #### Note
> A **Color Mode** setting of **Black and White** is available only in JPEG and TIFF data formats.

Mechanical
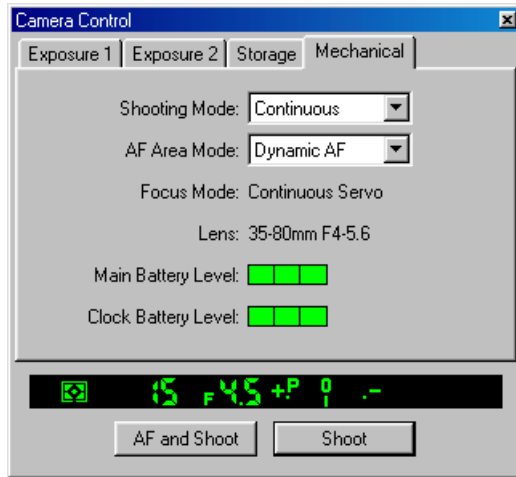
From the Mechanical tab, changes can be made to the following settings:

Shooting Mode

Sets the shooting mode for PC mode to **Single** (single-frame shooting) or **Continuous** (continuous shooting). At a setting of **Continuous**, photographs will be taken as long as the camera's shutter-release button is held down. The advance rate can be set in the Custom Settings window (see "Custom Settings," later in this chapter). Changes to this setting are applied to Custom Setting 30 in the camera's memory.

AF Area Mode

The following options are available:

Single Area AF

The camera focuses on the subject in the area selected for autofocus. This mode is useful when focusing on subjects that are relatively stationary.

Dynamic AF

The camera first focuses on the subject in the area selected for autofocus. If the subject moves to another focus area, the camera will automatically shift the focus area to follow it (the focus area shown in the viewfinder will not, however, change). This makes it possible to focus on subjects that are moving irregularly.

Focus Mode

The autofocus mode setting is displayed. While adjustments to autofocus mode can not be made from *Nikon Capture*, the following settings are available on the camera:

Single Servo

The shutter can only be released when the in-focus indicator (●) appears in the simulated LCD panel in the Camera Control window or in the camera's viewfinder.

Continuous Servo

The camera will focus continuously as long as the shutter-release button on the camera is held down. The shutter can be released even when the camera is not in focus.

Manual

Use in situations where autofocus may not work as expected or a lens other than an AF Nikkor is attached.

Lens

Displays the focal length and maximum aperture of the lens currently attached to the camera. Depending on the lens type, some information may not be displayed.

Main Battery Level

Displays the level of the main camera battery, the power source for all primary camera functions, including metering and autofocus. When the indicator drops to one third or less, replace the battery pack with a fully charged spare battery pack or use an EH-4 AC adapter (available separately).

Clock Battery Level

Displays the level of the camera's clock battery, which powers the D1's internal clock and internal memory when the camera is turned off and/or the main battery is removed.

Saving and Loading Camera Control Settings

Using *Nikon Capture*, it is possible to save Camera Control settings as well as to load and apply previously saved settings. Select **Camera Control** from the **Settings** menu.
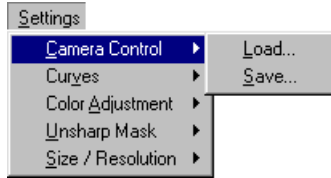
Load

After selecting the **Load…** command, an "Open" dialog will appear, asking you to choose the Camera Control settings file you want to open. Navigate to the directory where the file is saved (the default is the folder to which *Nikon Capture* was installed) and open the file (Windows users should look for the ".**ncc**" extension on Camera Control settings files). The current settings in the Camera Control window will change to those of the file you just opened.

Save…

After making all of the necessary adjustments to the Camera Control window and selecting the **Save…** command from **Settings** > **Camera Control**, use the "Save As" dialog to name the file and determine where it is to be saved (the default is the folder to which *Nikon Capture* was installed). Windows users will see the extension ".**ncc**" added to the file name.

Tip

Right-button menu (Windows)
The **Camera Control** submenu can be displayed by right-clicking in the Camera Control window.

Time Lapse Photography

Nikon Capture gives users the ability to program the D1 to automatically take a user-determined number of photos at consistent time intervals, set by the user. This function is only available when the D1 is controlled from *Nikon Capture*.

1 Choose **Time Lapse Photography…** from the **Camera** menu.
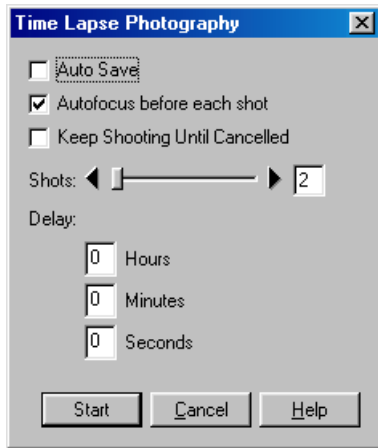
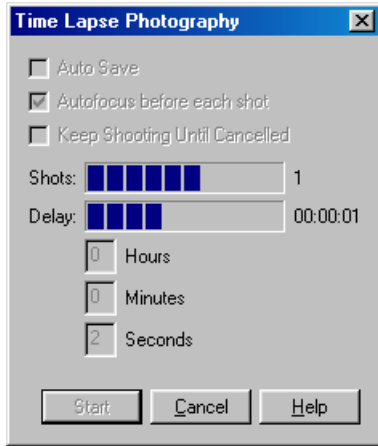**2** Using the slider, determine the number of photos you want the camera to take (you can choose from 2–99).

3 Enter the time interval between shots (00:00:01–99:59:59). Note that if the interval is shorter than the time required to record each photograph, the actual interval will be longer than that specified in the Time Lapse Photography dialog.

> ### Note
>
> When the camera is operating on battery power and *Nikon Capture* has been set to keep the camera awake for fifteen minutes (this setting is controlled from the General tab of the Preferences dialog; see "Preferences: The General Tab"), do not specify an interval greater than fifteen minutes. When taking photographs at longer intervals, use an EH-4 AC adapter (available separately).
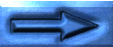
4 Click the **Start** button. The following dialog will be displayed.

Time Lapse Photography

- [ ] Auto Save
- [x] Autofocus before each shot
- [ ] Keep Shooting Until Cancelled

Shots: ▮▮▮▮▮   1

Delay: ▮▮▮   00:00:01

   0   Hours

   0   Minutes

   2   Seconds

[Start]   [Cancel]   [Help]

The camera will immediately take the first photo in the series. As photos are taken, the images will appear in the Thumbnails section of the Camera Image window. At any time during the Time Lapse Photography process, you can click on the **Cancel** button to stop shooting.

5 When the specified number of shots have been taken, or the **Cancel** button selected, the Time Lapse Photography window will return to its default settings. Click on the **Cancel** button to close the Time Lapse Photography window.

Auto Save
With Auto Save on, thumbnails of the photos will not be visible in the Thumbnails section of the Camera Image window as they are taken. Instead, they will be saved directly to your computer's hard disk.

Autofocus before each shot
If this option is selected, the camera will engage autofocus before releasing the shutter for each shot.

Keep Shooting Until Cancelled
With this option, you do not determine the number of shots to be taken, only the interval between shots. The camera will continue taking photos until you click on the **Cancel** button. The box where you would normally enter the number of photos to be taken will change to a simple counter which keeps a running count of shots.

Note

No other operations can be performed until the Time Lapse Photography window is closed.

Note

Should the destination disk for the photos taken using Time Lapse Photography become full, a warning message will appear. You must either change the destination disk or cancel Time Lapse Photography.

Custom Settings

Nikon Capture allows you to view and adjust most Custom Settings from the computer. For more information on Custom Settings, see the D1 *User's Manual*.

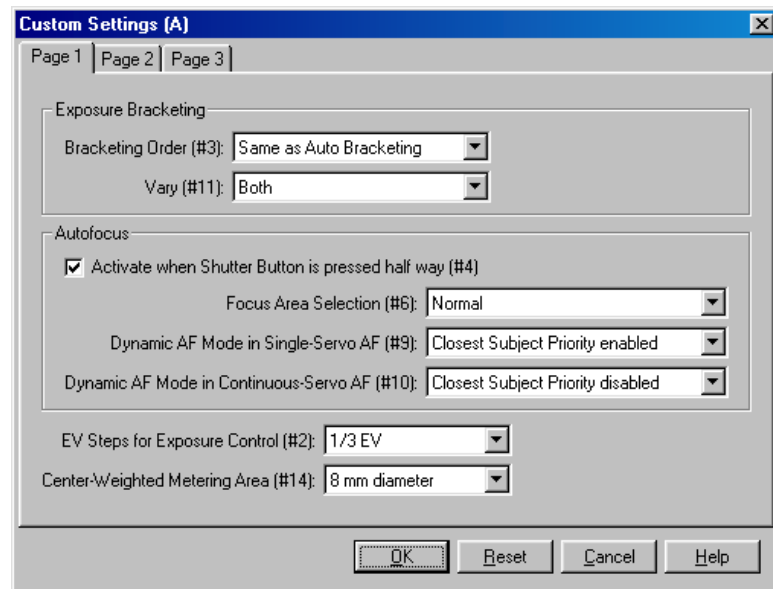**1** Choose **Select Custom Settings Set…** from the **Camera** menu.
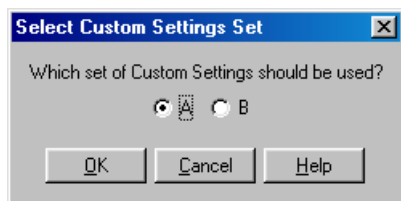
2 Click on either **A** or **B** to select the corresponding Custom Set. Click **OK** to apply settings in the Custom Set.
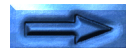
3 Select **Custom Settings…** from the **Camera** menu.

The Custom Settings applied to the set selected in step 1 can be viewed and edited from the Custom Settings window's three pages.

4 After viewing and making any changes to the current Custom Set, click **OK** to apply and save settings to the camera. Clicking the **Reset** button will return the selected Custom Set to the camera's default settings.

Note

While Camera Control settings files can be saved to the computer's hard disk, Custom Settings are saved directly to the camera. Therefore, it is impossible to save more than two sets (**A** and **B**) of Custom Settings.
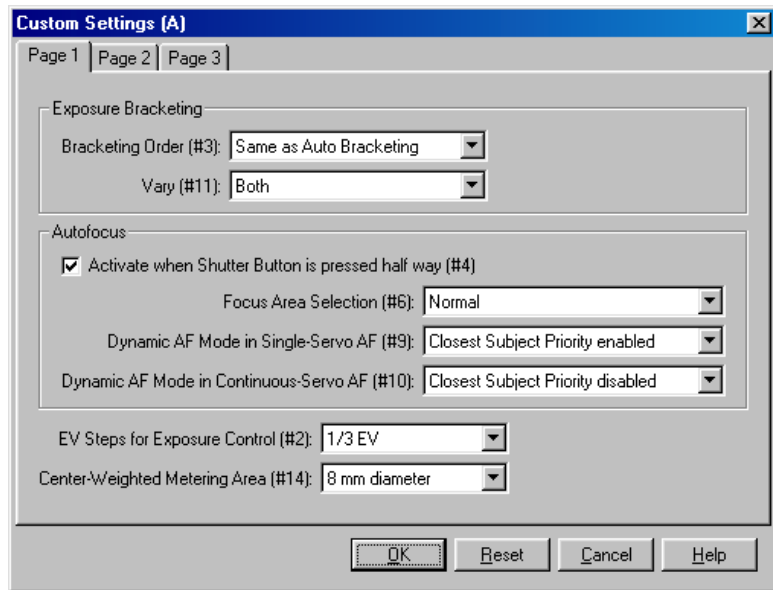
Page 1

From the Page 1 tab, changes can be made to the following settings:

Exposure Bracketing

Bracketing Order (#3)

This setting controls the order in which shots are taken when exposure bracketing is used. The following options are available:

Same as Auto Bracketing (default)
Shots are taken in the order: no compensation, negative compensation (underexposure), positive compensation (overexposure).

Negative to Positive
Shots are taken in the order: negative compensation (underexposure), no compensation, positive compensation (overexposure).

Tip

Numbers and titles appearing in parenthesis (#4 Autofocus Activation) refer to the Custom Settings item numbers and names. See the camera *User's Manual* for more information.

Note

Any changes made to **Custom Set A** or **B** are automatically applied and saved to the camera and *Nikon Capture*. The settings in effect when you quit *Nikon Capture* or turn off the camera are those that will be applied when *Nikon Capture* is next opened, or the camera next turned on.

Camera Operation: Custom Settings   - 104 -

Vary (#11 Auto Exposure/Flash Exposure Bracketing)

By default, when a Speedlight is used with auto bracketing, flash exposure bracketing and auto-exposure bracketing will be performed simultaneously. Using this item, you can change camera settings so that only flash exposure bracketing or only auto-exposure bracketing is performed. The following options are available:

Shutter/Aperture Only

Only Auto Exposure bracketing is performed.

Flash Output Level Only

Only Flash Exposure bracketing is performed.

Both (default)

Auto Exposure Bracketing and Flash Exposure Bracketing are performed together.

Autofocus

Activate when Shutter Button is pressed half way (#4 Autofocus Activation)

If this option is checked (default), autofocus is activated when the shutter-release button is lightly pressed. When it is not checked, the shutter-release button only controls the shutter, and autofocus must be activated using one of the AF start (AF-ON) buttons on the camera.

Focus Area Selection (#6)

This setting controls the operation of the AF Area Selector, which is displayed in the Camera Control window's **Mechanical** page. The following options are available:

Normal (default)

The focus area display is bounded by the four outer focus areas, so that, for example, pressing the focus selector toward the top when the top focus area is already selected will have no effect.

Wraparound in effect

The focus area "wraps around" from top to bottom and right to left. Pressing the focus selector toward the top when the top focus area is highlighted selects the bottom focus area, and vice-versa. Similarly, pressing the selector to the right when the right area is highlighted selects the left focus area.

Dynamic AF Mode in Single-Servo AF (#9)

This setting controls autofocus when the AF mode is set to **Single** and the AF Area mode is set to **Dynamic** (Camera Control, **Mechanical** page). The following options are available:

Closest Subject Priority Disabled

Closest subject priority disabled.

Closest Subject Priority Enabled (default)

Closest subject priority enabled. With closest subject priority enabled, the camera automatically focuses on the nearest object that falls in any of the five focus areas.
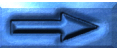
Dynamic AF Mode in Continuous Servo AF (#10)

This setting controls autofocus when the AF mode is set to **Continuous Servo** and the AF Area mode is set to **Dynamic AF** (Camera Control, **Mechanical** page). User options are:

Closest Subject Priority disabled (default)

Closest subject priority disabled.

Closest Subject Priority enabled

Closest subject priority enabled. With closest subject priority enabled, the camera automatically focuses on the nearest object that falls in any of the five focus areas.

EV Steps for Exposure Control (#2)

Sets the exposure increment for adjusting aperture, shutter speed, exposure compensation, and auto bracketing. Increments of $\frac{1}{3}$ EV (default), $\frac{1}{2}$ EV, and 1 EV are available.

Center-Weighted Metering Area (#14)

By default, center-weighted metering assigns the greatest weight to a circle in the center of the viewfinder 8 mm (0.32″) in diameter. The diameter of the area assigned the greatest weight can be changed to 6 mm (0.24″), 10 mm (0.39″), or 13 mm (0.51″), or exposure can be based on the average lighting for the entire frame.
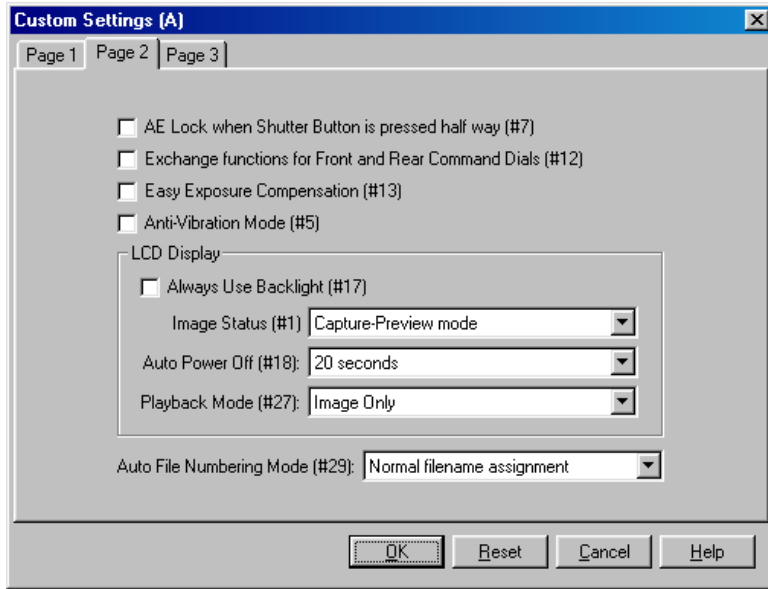
Page 2

From the Page 2 tab, changes can be made to the following settings:

AE Lock when Shutter Button is pressed half-way (#7 AE Lock)

When this item is checked, exposure is locked while the shutter-release button is lightly pressed. If it is not checked (the default setting), the AE-L/AF-L button on the camera must be pressed to lock exposure.

Exchange functions for Front and Rear Command Dials (#12 Command Dial Functions)

If this option is checked, the functions of the main- and sub-command dials are reversed. Default is off.

Easy Exposure Compensation (#13 Exposure Compensation Settings)

If this option is checked, exposure compensation can be set by turning the sub-command dial (programmed auto or shutter-priority auto) or main command dial (aperture-priority auto or manual). If the roles of the main command and sub-command dials are switched using Custom Setting 12, exposure compensation will be assigned to the sub-command dial in programmed auto, aperture-priority auto, and manual modes, and to the main command dial in shutter-priority auto. If this option is not checked, exposure compensation can be set by pressing the exposure compensation button on the camera and rotating the main command dial. Default is off.

Anti-Vibration Mode (#5 Delay Exposure until Mirror Shock Has Subsided)

If this option is checked, the shutter will release slightly after the shutter-release button has been pressed, minimizing camera shake. Default is off.

LCD Display

Always Use Backlight (#17 LCD Illumination)

This option allows the user to determine whether the LCD illuminators (backlights) will come on whenever a button is pressed. By default, the LCD illuminators are controlled by the camera power switch.

Image Status (#1)

This setting controls when photographs taken in single-frame shooting or self-timer mode are displayed in the LCD monitor after they are taken. User options are:

Photograph is not displayed (default)

Photograph is not displayed after shooting.

Capture-Preview mode

Photograph is displayed before being saved to the memory card.

Record-and-Review mode

Photograph is displayed after being saved to the memory card.

Auto Power Off (#18 LCD Monitor Auto Power Off)

This setting determines the length of time an image will be displayed in the camera's LCD monitor if no operations are performed. The limit for display can be set to 20 seconds (default), 1 minute, 5 minutes, or 10 minutes.

Tip

When adjusting settings for the LCD illuminator, keep in mind that much of the information displayed in the control panels will be visible on your computer screen. Limiting the backlight will slow the drain on the camera's battery.

Playback Mode (#27 LCD Monitor Display Mode)

This setting allows the user to determine what information is played back in the camera's LCD panel during capture preview, record-and-review, or single image playback. User options are:

Image Only (default)

Histogram
Shows the distribution of shadows, mid-tones and highlights in the image.

Highlight Point
The brightest portions of the image are displayed

Histogram and Highlight Point

Auto File Numbering Mode (#29)

The D1 stores photographs in numbered files and folders. Because no two photographs or folders on any given memory card will have the same number at the same time, there is no possibility of confusion so long as you continue to use a single memory card without formatting it. If you format the card or use a new card, however, a number previously assigned may be used again. If you then copy a folder or photograph to a computer, an earlier folder or photograph with the same number may be overwritten. This can be prevented using sequential filename assignment. With this option, file numbers will not be reused.

Normal filename assignment (default)
File numbers will be reused as necessary.

Sequential filename assignment
File numbers will not be reused.
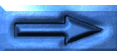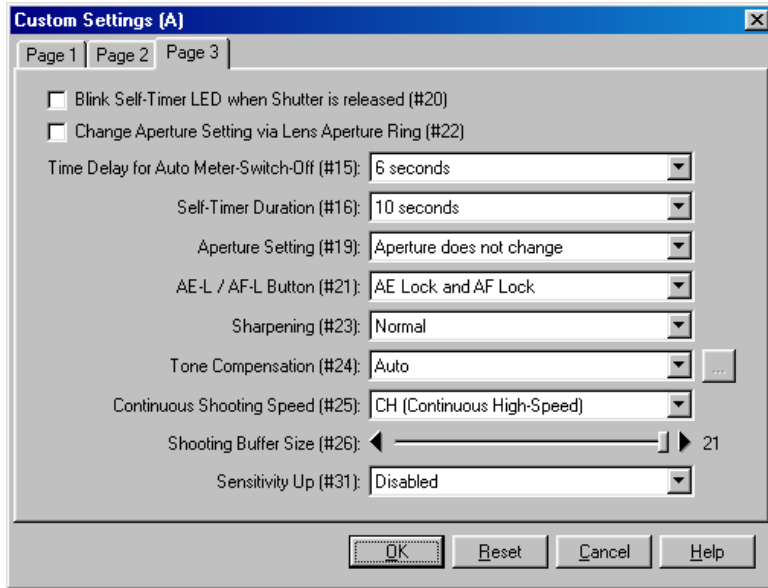
From the Page 3 tab, changes can be made to the following settings:

Blink Self-Timer LED When Shutter is released (#20 Shutter Release Indication via Self-Timer Lamp)

If this option is checked, the self-timer indicator light blinks once when the shutter-release button is pressed or *Nikon Capture*'s **AF and Shoot**/**Shoot** buttons are clicked. Default is off.

Change Aperture Setting via Lens Aperture Ring (#22 Aperture Selection)

If this option is checked, aperture can only be set using the lens aperture ring. If this item is not checked (default), aperture can only be set using the sub-command dial.

Time Delay for Auto Meter Switch-Off (#15)

This setting allows the user to determine the duration of time that the camera meters remain on after you take your finger off the shutter-release button. Auto meter switch-off can be set to four, six, eight, or sixteen seconds (note that longer times shorten battery life). The default is six seconds.

Self-Timer Duration (#16)

This setting allows the user to determine the length of time between the shutter-release button being pressed and the shutter being released in self-timer mode. Delay can be set to two, five, ten, or twenty seconds. The default is ten seconds.

Zoom Lens Aperture
(#19 Aperture Setting During Zooming)

This setting applies only to zoom lenses. The user can determine how lens aperture is adjusted after zooming. User options are:

Aperture does not change (default)

Aperture remains constant.

Aperture changes with focal length

Aperture is adjusted while zooming to remain proportional to the maximum aperture.

AE-L/AF-L Button (#21)

This determines the functions performed by the AE-L/AF-L button. User options are:

AE Lock and AF Lock (default)

Both auto exposure and autofocus are locked while the AE-L/AF-L button is pressed.

AE Lock Only

Only auto exposure is locked while the AE-L/AF-L button is pressed.

AF Lock Only

Only autofocus is locked while the AE-L/AF-L button is pressed.

AE Lock and Hold

Auto exposure is locked when the AE-L/AF-L button is pressed, and remains locked until the button is pressed a second time.

Sharpening (#23)

This setting allows the user to increase or lower the sharpness of edges in photographs. Sharpness can be turned off or set to low, medium (the default value), or high.

Tone Compensation (#24)

This allows the user to designate which of the five available tone curves is to be used. User options are:

Auto (default)

Camera adjusts curves to produce optimal contrast.

Normal

Suitable for scenes with a normal distribution of shadows, mid-tones and highlights.

Low-Contrast

Prevents highlights in brightly lit scenes from being "washed out."

High-Contrast

Brings out hazy background details.

User-Defined Curve

Custom curve defined using **Edit Camera Curves** option.

Edit Camera Curves

When **Tone Compensation** (#24) is set to **User-Defined Curve**, the user is able to create a custom tone curve in the Edit Camera Curves dialog and download it to the camera.

To create a custom curve, click the ▢ button (Windows) or the **Choose...** button (Macintosh). The Edit Camera Curves window will be displayed.
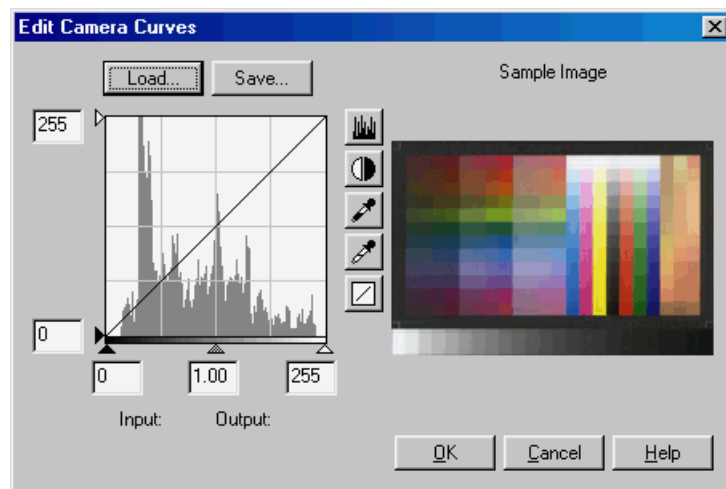
Tip

Although values for input and output in the Edit Camera Curves window range from zero to 255 (eight-bit precision), internal calculations are made at a precision high enough to be used in the camera's twelve-bit analog-to-digital conversion process. Changes to the curve in the Edit Camera Curve window are applied to the camera's Normal curve and saved in the camera's memory as a separate, user-defined curve. The default user-defined curve has the same effect as the Normal curve.

The controls in the Edit Camera Curves window are identical to those in the Curves window, except in the following respects: (1) only the master channel, not individual RGB channels, may be edited; (2) there is a limit of 20 spline points; (3) the mid-point may not be edited; (4) a user-defined sample image can be displayed.

The upper left section of the Edit Camera Curves window contains **Load…** and **Save…** buttons. By clicking the **Load…** button, previously stored curves, with less than 20 spline points, can be selected via the "Open" dialog (if the selected file has more than 20 spline points, a warning will be displayed, and no file will be loaded). In Windows, look for files with the ".**ncv**" extension.

The **Save…** button opens the "Save As" dialog, allowing the user to save curve files.

Continuous Shooting Speed
(#25 Shooting Speed in Continuous Shooting Mode)
This setting allows the user to set the frame advance rate for continuous shooting mode. The advance rate can be set to one, two, or three frames per second or to the default setting (continuous high speed, or about 4.5 frames per second), or the camera can be set so that each photo is recorded to the memory card before the following picture is taken (continuous low speed).

Shooting Buffer Size
(#26 Maximum Number of Consecutive Shots in Continuous Shooting Mode)
This setting limits the maximum number of frames taken in **Continuous Shooting** mode before photographs begin to be transferred to the memory card. Any value between one and twenty-one is possible (at a setting of HI-RAW, the maximum number of frames which can be taken in **Continuous Shooting** mode is limited to ten).

Sensitivity Up (#31)
Using this option, sensitivity (ISO equivalency) can be increased by approximately 1EV or 2EVs over ISO 1,600 equivalent.

Custom Settings which cannot be adjusted from the Custom Settings window

There are four **Custom Settings** that can not be adjusted from the **Custom Settings** window:

- # 0 Custom Set: adjustable from the separate **Camera** menu item, **Select Custom Settings Set…**

- # 8 Mirror Up: not adjustable from *Nikon Capture*

- #28 Save RAW Images: RAW data format is automatically enabled while the camera is connected and the computer is running *Nikon Capture*

- #30 Shooting Mode in PC Mode: adjustable from the Camera Control window, Mechanical page

Preferences

This chapter describes the options available in the Preferences dialog. To open the Preferences dialog, select **Preferences…** from the **File** menu. The Preferences dialog contains six tabs, which offer access to the settings summarized in the following table.

Function	Tab
Adjust image window display settings and specify the default image enhancement settings applied to newly captured images.	General
Specify the folders used for temporary storage and the application used to open images that have been saved in their final form.	File locations
Change settings for deleting thumbnails and displaying thumbnail IDs.	Thumbnails
Set the defaults for the white point and black point in the Curves window.	Curves
Specify the size and color of the grid displayed in the Preview section or image windows.	Grid lines
Select the profiles used for Nikon Color Management.	CMS

The General Tab
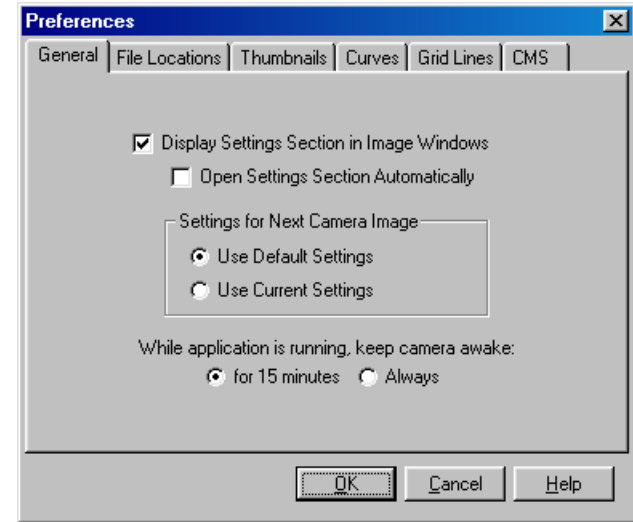
The **General** tab contains the following items:

Display Settings Section in Image Window

When this box is checked, the Camera Settings will be displayed (camera settings are displayed by default).

Open Settings Section Automatically

If **Display Settings Section in Image Window** is checked, you can choose whether the Camera Settings section will be opened automatically when an image is opened in the Camera Image window or in a new image window. The default setting for this check box is "off" (Camera Settings not open).

Settings for Next Camera Image

Choose the settings (Curves, Color Adjustment, Unsharp Mask, crop size and location, and output size and resolution) that will apply to the next image captured from the camera.

Use Default Settings

The image is processed according to default settings

Use Current Settings

The image is processed according to the settings now in effect.

While application is running, keep camera awake:

Set the length of time before automatic meter switch-off when the camera is running on battery power. This setting only takes effect when the camera is properly connected and powered on, and only when the camera is operating on battery power. The time set here takes precedence over the time specified for automatic meter switch-off in the camera's Custom Settings menu.

for 15 minutes

Automatic meter switch-off is set to fifteen minutes.

Always

The camera stays awake indefinitely.

When powered by an EH-4 AC adapter (available separately), the camera stays awake indefinitely.

The File Locations Tab
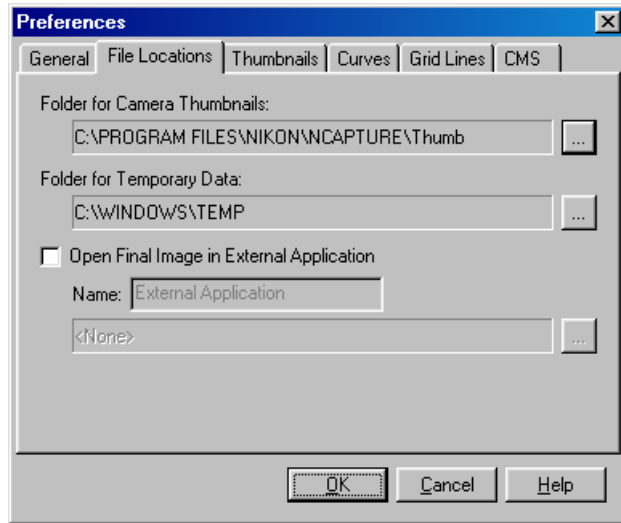
The **File Locations** tab contains the following items:

Folder for Camera Thumbnails:

Specify the folder in which image and other data used in the Camera Image window will be stored. The default folder is the "Thumb" folder in the directory to which *Nikon Capture* was installed. To choose a different folder, click the ▣ button (Windows) or the **Choose...** button (Macintosh) and navigate to the desired location.

Folder for Temporary Data:

Specify the folder in which temporary data, such as image cache data, will be stored. The default folder for Windows is the "TEMP" folder in the Windows directory, while the default folder for the Macintosh is the "Temporary items" folder in the root directory of the start-up disk. To choose a different folder, click the ▣ button (Windows) or the **Choose...** button (Macintosh) and navigate to the desired location.

Open Final Image in External Application

Choose whether images saved using *Nikon Capture*'s **Save Final Image...** command will be opened automatically in a specified third-party application. By default, images are not opened automatically in an external application. When this box is checked, you can enter a name and path (twenty-five characters or less) for an external application, or click the ▣ button (Windows) or the **Choose...** button (Macintosh) to navigate to the desired application. Note that third-party applications can not open images saved in NEF or YCbCr-TIFF format (if you have installed the Nikon YCC *Photoshop* plug-in provided with *Nikon View DX* (available separately), you will be able to open YCbCr-TIFF images in *Adobe Photoshop* version 4.0 or later).

The Thumbnails Tab
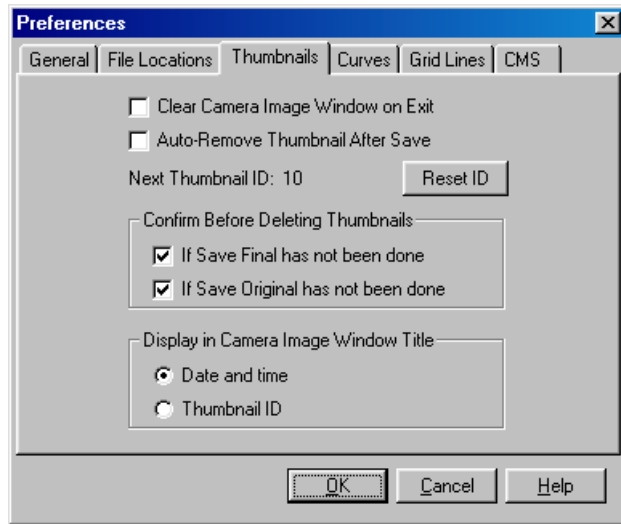
The **Thumbnails** tab offers a choice of settings for the Thumbnails section in the Camera Image window.

Clear Camera Image Window on Exit

Controls whether thumbnails will be removed from the Thumbnails section when you exit *Nikon Capture*. If this box is checked, a confirmation dialog will be displayed on exit (no dialog will be displayed if there are no thumbnails in the Camera Image window). If this box is not checked (the default option), thumbnails will be saved and will be displayed in the Thumbnails section when you next start *Nikon Capture*.

Auto-Remove Thumbnail After Save

Controls whether the associated thumbnail preview will automatically be removed from the Thumbnails section when an image is saved. By default, the thumbnail remains on display.

Next Thumbnail ID:

Displays the ID that will be used for the next thumbnail loaded into the Camera Image window.

Reset ID

Click this button to reset the thumbnail ID for the next thumbnail loaded into the Camera Image window to one (1). The number that will be assigned to the next thumbnail is displayed to the left of the button.

Confirm Before Deleting Thumbnails

Controls whether and at what point a confirmation dialog will be displayed when you delete a thumbnail for an image that has yet to be saved. Either or both of the options listed below may be selected; if neither is chosen, no dialog will be displayed (by default, both options are selected).

If Save Final has not been done

A confirmation dialog is displayed if the image has not been saved using the **Save Final Image…** command.

If Save Original has not been done

A confirmation dialog is displayed if the image has not been saved using the **Save Original Image…/Save Raw Image…** command.

Display in Camera Image Window Title

These radio buttons are used to specify the information that will be displayed in the title bar of the Camera Image window when a thumbnail is selected. You can choose to display either the date of recording (default) or the thumbnail ID.

The Curves Tab
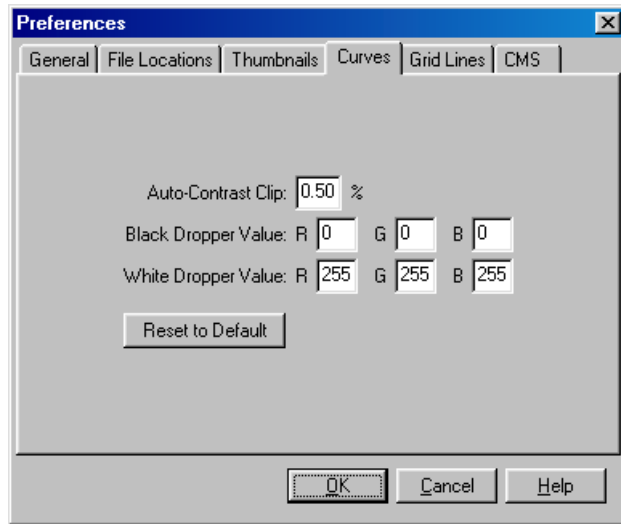
The **Curves** tab controls Auto Contrast and the default output levels for the black point and white point in the Curves window.

Auto-Contrast Clip:
Controls how the Auto Contrast operation calculates the input values for the white point and black point. By default, the white point is set to a value that excludes 0.50% of the brightest pixels in the current crop, the black point to a value that excludes 0.50% 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 0 will set the black and white points respectively to the darkest and brightest pixel in the crop). To increase the dynamic range at the expense of detail, raise the "excluded" value.

Black Dropper Value/White Dropper Value:
Controls the default output values for white point and black point. Output for each channel can be set to a value between zero and 255; these settings can also be adjusted in the Curves window. By default, output levels for the white point are 255 for each channel, which displays as white on most computer monitors. The defaults for the black point are 0 for each channel, which displays as black.

Reset to Default
Click this button to restore settings in the **Curves** tab to their default values.

The Grid Lines Tab
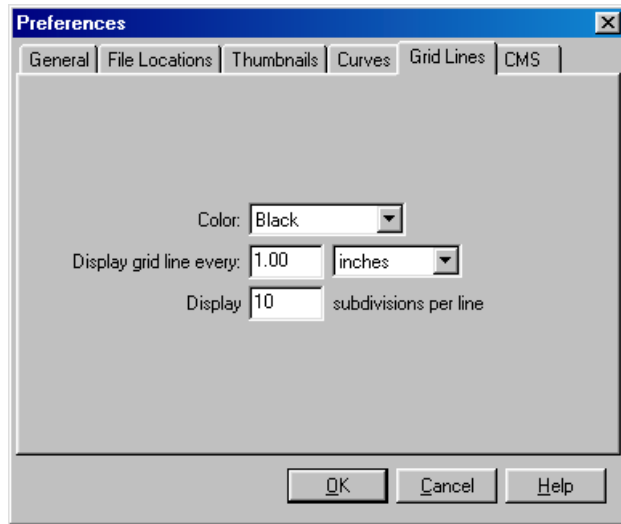
The **Grid Lines** tab controls the color and spacing of the non-printing grid lines overlaid on an image when **Show Grid Lines** is selected from the **Image** menu.

Color:
The color of the grid lines can be selected from white, light gray, dark gray, black, red, green, blue, cyan, magenta, and yellow. The default setting is black.

Display grid line every:
Enter a value for grid spacing in the text box. The units for the grid can be selected from the pop-up menu to the right of the text box. The options available are pixels, inches, millimeters, centimeters, picas, and points; at settings other than pixels grid spacing can be entered up to two decimal points. The default setting is one inch.

Display *n* subdivisions per line
The number of subdivisions into which each grid cell will be divided. The main grid is displayed as solid lines of the color specified using the **Color** option, the subgrid as broken lines of the same color.

The CMS Tab
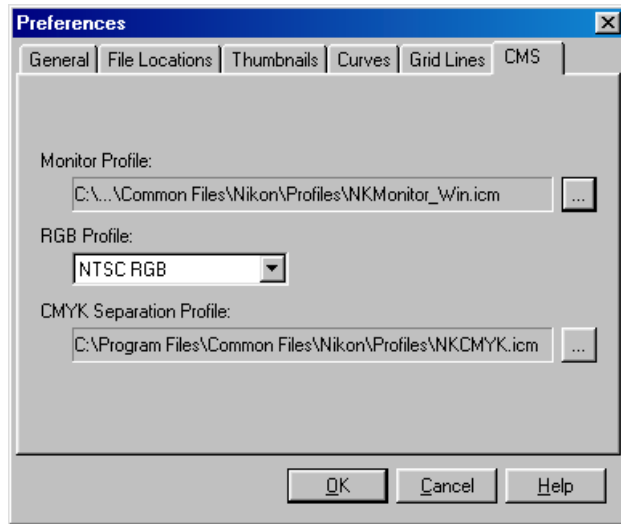
The **CMS** tab is where you specify the color management profiles used for displaying images on your monitor, editing and saving RGB images, and saving and printing CMYK images.

Monitor Profile

The ICC monitor profile used to adjust the display for the non-linear characteristics of your monitor is displayed here. To choose a different profile, click the ☐ button (Windows) or the **Choose…** button (Macintosh) and navigate to the desired location.

RGB Profile

The profile used for editing images in the RGB color space can be selected from the pop-up menu. The profile will be saved together with the image if a file format that supports this feature, such as TIFF or JPEG, is used.

CMYK Separation Profile

The profile used when converting RGB images to CMYK is displayed here. To choose a different profile, click the ☐ button (Windows) or the **Choose…** button (Macintosh) and navigate to the desired location.

> ### Tip
> *Nikon Capture* supports only ICC (International Color Consortium) monitor and CMYK profiles. Particular care should be exercised when choosing a CMYK profile, as the profiles supplied by the manufacturer of your output device may not be an ICC profile.

Reference

This chapter outlines the options available in *Nikon Capture*'s menus.

File menu

By clicking on **File** in *Nikon Capture*'s menu bar, you can access the following commands:
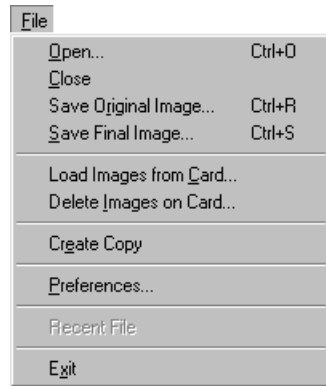
Windows   Macintosh

Open…

Images saved in *Nikon Capture*'s Nikon Electronic Image Format (NEF) can be opened and viewed. Unedited images taken by the D1 in RAW, JPEG, or TIFF formats can also be opened.

Close

Close the active window.

Save Original Image…

The image in the active window will be saved in NEF format. Changes to curves, color balance, and Unsharp Mask are not applied to the image data, but are saved separately in the same file.

Save Final Image…

Saves the final image in a format, determined by the user, which can then be opened in third party applications such as *Adobe Photoshop* or *Internet Explorer*. Once saved in this format, images can no longer be opened in *Nikon Capture*.

Load Images from Card…

Your computer captures images from a selected folder on the camera's memory card. Captured images will appear in the Thumbnail section of the Camera Image window.

Delete Images on Card…

Images will be deleted from a selected folder on the camera's memory card.

Create Copy…

A copy of the image selected in the Camera Image window or, if an image window is active, of the image in the active image window will appear in its own image window.

Preferences…
The Preferences dialog will open, allowing you to make adjustments to *Nikon Capture* preferences. See "Preferences" for details on adjusting *Nikon Capture* preferences.

Recent Files (Windows only)
Recently opened files will be listed in the order that they were opened.

Exit (Windows)/**Quit** (Macintosh)
Quit *Nikon Capture*.

Edit

By clicking on **Edit** in *Nikon Capture*'s menu bar, you can access the following commands:
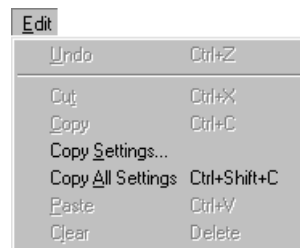
Windows   Macintosh
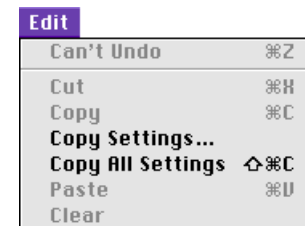
Undo
Returns the image to the state it was prior to the last editing function performed. This item is only active when the last action performed was one that can be undone.

Cut
This command is never active.

Copy
This command is never active.
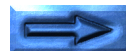
Copy Settings…
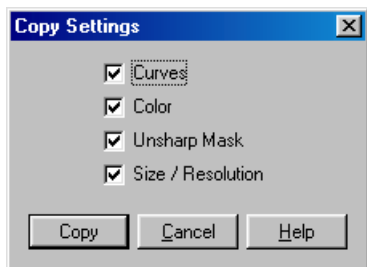
You can select which groups of settings you would like to copy to the clipboard. Click on the **Copy** button after you have selected Curves, Color Adjustment, Unsharp Mask and/or Size/Resolution.

Copy All Settings
Copies all Curves, Color Adjustment, Unsharp Mask and Size/Resolution settings to the clipboard.

Paste
Applies the copied settings to the image in the active window.

Clear
This command is never active.

View

By clicking on **View** in *Nikon Capture*'s menu bar, you can access the following commands:
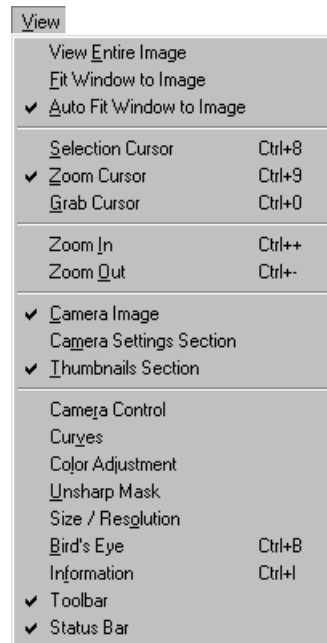
Windows

Macintosh
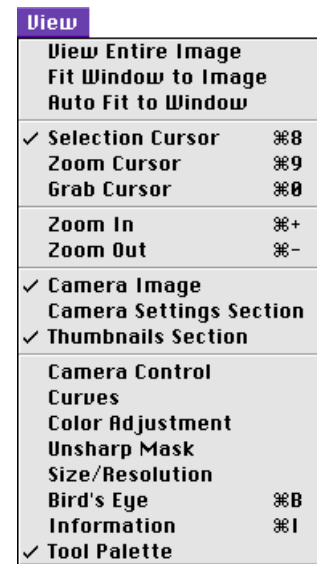
View Entire Image
Nikon Capture adjusts the magnification of the image to fit the active window.
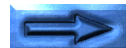
Fit Window to Image

Nikon Capture adjusts the size of the image window or Camera Image window Preview section to fit the image.

Auto Fit Window to Image/Auto Fit to Window

Nikon Capture automatically adjusts the window to fit each new image.

Selection Cursor

With **Selection Cursor** checked, the cursor becomes a +, allowing you to select a portion of the image in the active window to work with.

Zoom Cursor

With **Zoom Cursor** checked, the cursor becomes a 🔍, allowing you to zoom in on a portion of the image in the active window. To zoom out, hold down the **Ctrl** (Windows) or **option** (Macintosh) key while clicking in the active window.

Grab Cursor

With **Grab Cursor** checked, the cursor becomes a 🖑, allowing you to move the image around in the active window, changing your view of the image. This function performs much the same as scrolling through the window does, with slightly more control.

Zoom In

Choosing this option causes *Nikon Capture* to zoom in on the image in the active window.

Zoom Out

Choosing this option causes *Nikon Capture* to zoom out from the image in the active window.

Camera Image

When **Camera Image** is checked, the Camera Image window will be displayed.

Camera Settings Section

When this option is checked, the Camera Settings section is displayed in the active window.

Thumbnails Section

When this option is checked, the Thumbnails Section is displayed in the Camera Image window.

Camera Control

Selecting this option opens the Camera Control window, where you make changes to camera settings and take photos. See "Camera Operation: Camera Control" for details on using Camera Control.

Curves

When this option is checked, the Curves window is displayed. See "Image Adjustment: Curves" for details on using Curves.

Color Adjustment

When this option is checked, the Color Adjustment window is displayed. See "Image Adjustment: Color Adjustment" for details on using Color Adjustment.

Unsharp Mask

When this option is checked, the Unsharp Mask window is displayed. See "Image Adjustment: Unsharp Mask" for details on using Unsharp Mask.

Size/Resolution

When this option is checked, the Size/Resolution window is displayed. See "Image Adjustment: Output Size and Resolution" for details on using Size/Resolution.

Bird's Eye

When this option is checked, the Bird's Eye window is displayed. See "Working with Images: The Bird's Eye Window" for details on using Bird's Eye.

Information

Check this option to display the Information window.

Toolbar/Tool Palette

Check this option to display the toolbar (Windows) or tool palette (Macintosh).

Status Bar (Windows only)

Check this option to display the status bar at the bottom of the Nikon Capture window.

Image

By clicking on **Image** in *Nikon Capture*'s menu bar, you can see the following commands:
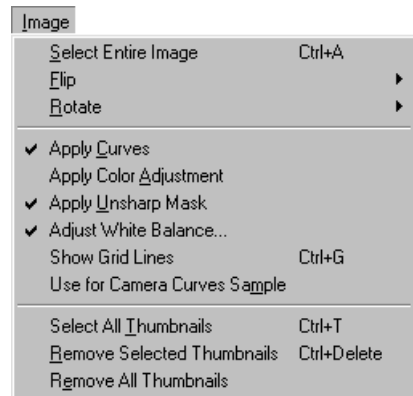
Windows   Macintosh
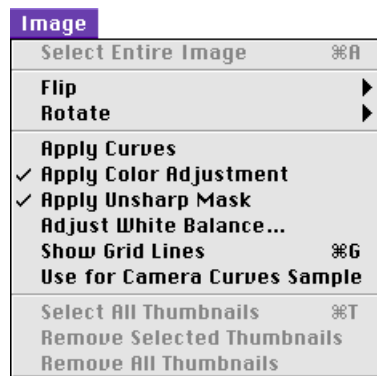
Select Entire Image
Nikon Capture selects the entire image for editing or saving to disk.

Flip
When you click on this item, a submenu appears giving you the choice of flipping the image currently visible in the active window horizontally or vertically.

Rotate
When you click on this item, a submenu appears giving you the choice of rotating the image in the active window 180°, 90° clockwise or 90° counterclockwise.

Apply Curves
With **Apply Curves** selected, adjustments can be made to the Curves window and applied to the image in the active window. When this option is off, adjustments can not be made to tone curves.

Apply Color Adjustment
With **Apply Color Adjustment** selected, adjustments can be made to the Color Adjustment window and applied to the image in the active window. When this option is off, adjustments can not be made to image color.

Apply Unsharp Mask
With **Apply Unsharp Mask** selected, adjustments can be made to the Unsharp Mask window and applied to the image in the active window. When this option is off, adjustments can not be made to image sharpness.

Adjust White Balance…
Displays the White Balance Adjustment window. This item is checked when the settings in the White Balance Adjustment window have been applied to the image in the active window.

Show Grid Lines
With this option selected, a non-printing grid becomes visible over the image in the active window. Grid Line settings can be adjusted from the Preference window's Grid Lines tab.
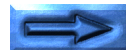
Use for Camera Curves Sample

Select the current thumbnail as the sample image for the Edit Camera Curves window in the Custom Settings dialog. See "Camera Operation: Custom Settings" for more information on the Edit Camera Curves window.

Select All Thumbnails

Choosing **Select All Thumbnails** highlights all of the thumbnails in the Thumbnail section. This option is most often used for saving and deleting images.

Remove Selected Thumbnails

Deletes the thumbnails selected in the Camera Image window.

Remove All Thumbnails

Deletes all images from the Camera Image window, and all thumbnails and full-sized images from the thumbnails folder designated in the *Nikon Capture* Preferences dialog.

Camera

By clicking on **Camera** in *Nikon Capture*'s menu bar, you can access the following commands:

Windows
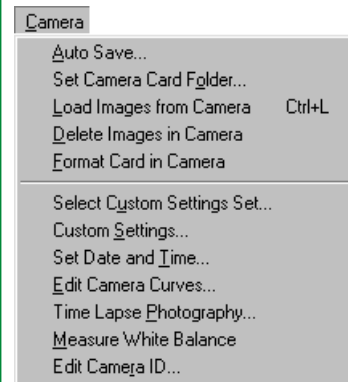
Macintosh

Auto Save…

Select **Auto Save…** to save photos directly to your computer's hard disk as they are taken. When you choose this function, the Auto Save dialog box will open, asking you to determine the destination folder, naming sequence, format, etc. Click **OK** to start Auto Save.

Set Camera Card Folder…

Opens the Set Camera Card Folder dialog, where you can choose the folder on the camera's memory card from which you will load and delete photographs.

Load Images from Camera

Captures images from the selected folder on the camera's memory card. Thumbnails of the photos will appear in the Thumbnail section of the Camera Image window.

Delete Images in Camera

Erases all images from the specified folder on the camera's CF card.

Format Card in Camera

Formats the card currently inserted in the camera. Remember that formatting the memory card permanently deletes any images remaining on the card.

Select Custom Settings Set…

When you select this option, the Custom Settings Set dialog opens, asking you to choose either of the two sets, **A** or **B**, to apply to the camera.

Custom Settings…

Opens the Custom Settings window, where you can adjust a variety of settings and apply them directly to the camera. See "Camera Operation: Custom Settings" or the D1 *User's Manual* for more information on Custom Settings.

Set Date and Time

The following dialog will open, allowing you to set the date and time used in the camera.
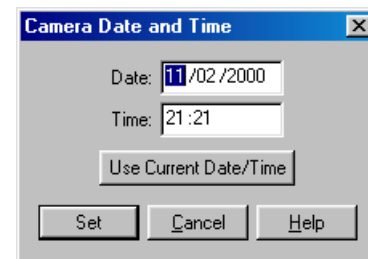
Edit Camera Curves…

Opens the Edit Camera Curves dialog, where you can edit the user-defined custom curve for use in the D1. This is not the same as the Curves window. For more information on the Edit Camera Curves window, see "Camera Operation: Custom Settings" earlier in this manual.

Time Lapse Photography…
The **Time Lapse Photography** option allows you to program the camera to take a series of photos at user-determined time intervals. See "Camera Operation: Time Lapse Photography" for a detailed explanation of this function.

Measure White Balance
Use this option to measure white balance for the preset white balance option in the camera's white balance menu. See "Camera Operation: Camera Control" for more information on white balance and measuring white balance. When **Measure White Balance** is selected, the following dialog will appear:

Nikon Capture | X
When the OK button is pressed, the camera will measure the White Balance required for the current environment. This measured value may be used by choosing 'Preset' in the White Balance control on the Camera Control Window.

OK   Cancel
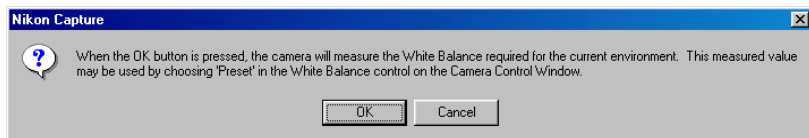
The value for white balance measured when the **OK** button is clicked takes effect when white balance is set to **Preset**.

Edit Camera ID…
So that your computer will recognize and remember the camera when it is attached, you can use the following dialog to give your camera a name up to forty characters in length.

Edit Camera ID | X

OK   Cancel   Help
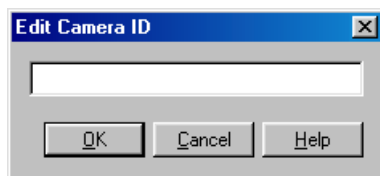
Settings
By clicking on **Settings** in *Nikon Capture*'s menu bar, you can access the following commands:

Windows

Settings
Camera Control ▶
Curves ▶
Color Adjustment ▶
Unsharp Mask ▶
Size / Resolution ▶

Macintosh

Settings
Camera Control ▶
Curves ▶
Color Adjustment ▶
Unsharp Mask ▶
Size/Resolution ▶
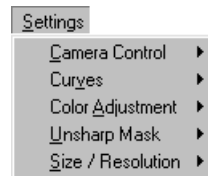
Camera Control
There are two options in the Camera Control submenu:
- **Load…**
  Loads previously saved Camera Control settings files.
- **Save…**
  Saves the current Camera Control settings.
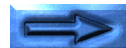
Curves

The Curves submenu contains the following options:

- **Load…**

  Loads previously saved Curves setting files.

- **Save…**

  Saves the current Curves settings.

- **Save as Default**

  Saves the current Curves settings as the default for *Nikon Capture*.

- **Reset to Default**

  Resets curves to default values.

- **Reset to Neutral**

  Resets curves to linear.

Color Adjustment

The Color Adjustment submenu offers the same options for saving and loading Color Adjustment settings as the Curves submenu does for curves. Choosing **Reset to Neutral** resets Color Adjustment settings to zero.

Unsharp Mask

The Unsharp Mask submenu offers the same options for saving and loading Unsharp Mask settings as the Curves submenu does for curves. Choosing **Reset to Neutral** removes all existing Unsharp Masks.

Size/Resolution

The Size/Resolution submenu offers the same options for saving and loading Size/Resolution settings as does the Curves submenu does for curves. Choosing **Reset to 100%** enlarges the crop to include the entire image and sets scale to 100%.

Window

By clicking on **Window** in *Nikon Capture*'s menu bar, you can see the following commands:
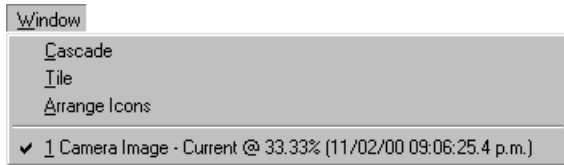
Windows

Macintosh

Cascade/Stack

Arranges the Camera Image window and image windows so that they overlap.

Tile

Arranges the Camera Image window and image windows so that they do not overlap.

Arrange Icons (Windows only)

If the Camera Image window or any image windows have been reduced to icons, this command will arrange the icons along the bottom of the Nikon Capture window.

Open Windows (Windows only)

A list of the windows currently open in *Nikon Capture* is displayed.

Help

Clicking **Help** in the menu bar displays the following options:

Windows
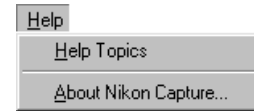
Macintosh
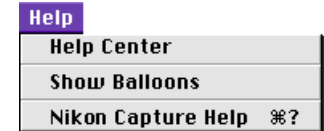
Help Topics/Nikon Capture Help

Selecting **Help Topics** (Windows) or **Nikon Capture Help** (Macintosh) opens *Nikon Capture*'s Help file to an index-type listing of help topics.

About Nikon Capture… (Windows only)

Selecting **About Nikon Capture…** opens a license window which displays the product name, version number, and copyright information.

In addition to **Nikon Capture Help**, the Macintosh help menu displays the standard items for the Macintosh operating system.

Toolbar (Windows)

The toolbar at the top of the Nikon Capture window contains buttons replicating some of the commands available in the menus. The toolbar can be hidden or displayed by selecting **Toolbar** from the **View** menu. When the cursor is positioned over a button, a label will pop up explaining its function.

The toolbar contains the following buttons:

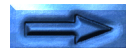| Button	Function
	Same as the **Open** command in the **File** menu
	Same as the **Save Original Image** command in the **File** menu
	Same as the **Save Final Image** command in the **File** menu
	Same as the **Create Copy** command in the **File** menu
	Same as the **Copy Settings** command in the **Edit** menu
	Same as the **Paste** command in the **Edit** menu
	Same as the **Selection Cursor** command in the **View** menu
	Same as the **Zoom Cursor** command in the **View** menu

Button	Function
	Same as the **Grab Cursor** command in the **View** menu
	Same as the **Curves** command in the **View** menu
	Same as the **Color Adjustment** command in the **View** menu
	Same as the **Unsharp Mask** command in the **View** menu
	Same as the **Size / Resolution** command in the **View** menu
	Same as the **Camera Control** command in the **View** menu
	Same as the **Camera Image** command in the **View** menu
	Same as the **90 degrees CW** command in the **Rotate** submenu of the **Image** menu
	Same as the **90 degrees CCW** command in the **Rotate** submenu of the **Image** menu
	The effects of changes to settings in the active image edit window (the White Balance Adjustment, Curves, Color Adjustment, or Unsharp Mask window) are hidden while this button is held down
	When this button is clicked, a question mark appears next to the mouse pointer. Clicking on a window, menu, or button while the question mark is displayed will open the help file to the section that explains the function of the item that was clicked.

Tool Palette (Macintosh)

The palette can be moved anywhere on the desktop, or hidden or displayed using the **Tool Palette** item in the **View** menu.

The tool palette contains the following buttons:

Button	Function
	Same as the **Selection Cursor** command in the **View** menu
	Same as the **Grab Cursor** command in the **View** menu
	Same as the **Zoom Cursor** command in the **View** menu
	Same as the **Camera Control** command in the **View** menu
	Same as the **Copy Settings** command in the **Edit** menu
	Same as the **Paste** command in the **Edit** menu
	Same as the **90 degrees CW** command in the **Rotate** submenu of the **Image** menu
	Same as the **90 degrees CCW** command in the **Rotate** submenu of the **Image** menu

Button	Function
	The effects of changes to settings in the active image edit window (the White Balance Adjustment, Curves, Color Adjustment, or Unsharp Mask window) are hidden while this button is held down

Note
The icon at the bottom of the tool palette is the connection status indicator. See "Basic Operation: Using *Nikon Capture*" for details.

Appendix A: Troubleshooting

Should you encounter a problem with *Nikon Capture*, check the list below before consulting your retailer or Nikon representative.

Nikon Capture won't start

Confirm that your computer system meets all of the requirements specified for using *Nikon Capture* (OS, memory, hard disk capacity, etc.). See the *Quick Start Guide*.

Nikon Capture doesn't recognize the camera

If the camera is connected to the computer, verify that the camera's mode dial is set to "PC". The upper LCD panel will show **PC**, as will the view through the camera's viewfinder.

Tip

Included on the installer CD-ROM is a README file containing the most current information on *Nikon Capture*. Please read this file before installing and using *Nikon Capture*, as it may contain information that could not be included in this manual. Should you encounter problems with *Nikon Capture* not covered in this section, please consult the README file for the most up-to-date information.

If you've verifed that the camera is set to PC mode, and *Nikon Capture* still can not find the camera, check the following points:

1 Check the camera's power switch and mode dial

• Is the camera's power switch set to "On"?

• Is the battery low?
It is recommended that the camera be powered by an EH-4 AC adapter (available separately) when connected to the computer.

• If you're using the AC adapter; is it connected properly?

2 Verify that the cables are properly connected

• Is the IEEE 1394 cable securely attached to both the camera and computer?
Remember that IEEE 1394 connectors do not make a "click" when fully inserted.

• Is there another peripheral connected to the computer's IEEE 1394 interface?
Try disconnecting other IEEE 1394 devices and connecting just the computer and the camera.
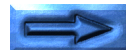
3 Does your system meet the requirements for running *Nikon Capture*?

Read the *Quick Start Guide*, located on this CD-ROM, to verify that your computer system meets all of the operating requirements for using the D1 and *Nikon Capture*.

Windows users
Is your IEEE 1394 interface driver HotConnect version 1.1 or later? If you have an older version installed, you can download the newest version from Adaptec's homepage.

Macintosh users
Check the version number of the FireWire Support Extension. If it is older than version 2.0, you can download the latest version from Apple's homepage.

Nikon Capture won't load images from my CompactFlash memory card

- Verify that the memory card is properly inserted in the camera.

- Were the images on the memory card taken by the D1?

Captured images are too bright, too dark or out of focus

- At default settings, *Nikon Capture* does not modify image images when they are captured from the camera. In the General tab of the Preferences dialog, verify that your images are being captured at *Nikon Capture*'s default settings and not the settings of the last image captured. See "Preferences" for more information. Alternatively, check the settings in the Curves, Color Adjustment, and Unsharp Mask windows. Choose **Reset to Neutral** from the **Settings** menu for each window, or turn the Apply button for the window off.

- Are your monitor settings correctly adjusted?
  Try adjusting your monitor's contrast/brightness, color system, etc. to be sure that it is properly set for viewing images. See the documentation provided with your monitor for instructions on adjusting monitor settings.

Appendix B: Glossary

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

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.

Clip

The percentage of pixels at both ends of the curve that are excluded in an auto contrast operation. *See also* Tone curve.

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*, 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* ColorSync, 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.

ColorSync

A color management system for Mac OS developed by Apple. *See also* Color management system, ICC.

CompactFlash memory card

A small, removable flash memory card. Used for storage of photographs in the D1 digital camera.

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 be lost when the file is restored. *See also* JPEG, TIFF.

Crop

The portion of the image selected in the Camera Image window Preview section or in an image window. If desired, portions of the image not in the crop can be excluded when the image is saved.

Curve

See Tone Curve.

Eyedropper

A tool for sampling white point, black point, or midpoint. *See also* Black point, Midpoint, White point.

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 $^{(1/\gamma)}$).

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 (**R**ed, **G**reen, and **B**lue) transmitted light displays (film transparencies and color monitors) is very different from, and complementary to, the gamut of secondary CMYK (**C**yan, **M**agenta, **Y**ellow, and Blac**K**) reflected light displays (printed materials). *See also* CMYK, Profile, RGB.

Gray point

See Midpoint.

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 in an image. The horizontal axis shows tone level (brightness), the vertical axis the number of pixels. The bars in the graph show the number of pixels of a given brightness in the image. The histogram displayed in the Curves window shows the distribution of tones for the currently selected channel, and can be used for reference when editing curves. *See also* Tone, Tone curve.

ICC

The **I**nternational **C**olor **C**onsortium, 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.

IEEE 1394

A high-speed transfer protocol developed by the **I**nstitute of **E**lectrical and **E**lectronics **E**ngineers 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.

LCD

Liquid **C**rystal **D**isplay. LCDs are notable for their thinness, lightness, and the fact that they consume relatively little energy.

Midpoint

Controls the output level for mid-tones in the original image. *See also* Tone, Tone curve.

NEF

An abbreviation of **N**ikon **E**lectronic Image **F**ormat, an image file format developed by Nikon to support high-resolution, twelve-bit RAW image data. In Windows, NEF files have the extension ".**nef**". NEF images can be opened and edited only in *Nikon Capture*. 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. NEF files however require a relatively large amount of storage space. *See also* RAW image.

Noise

Data in an image file that are not a part of the original image, the digital equivalent of film grain. The presence of noise is reflected in a loss in image quality. Noise appears primarily in dark areas of the image, and can be reduced by adjusting exposure or lighting to fill in shadows.

ppcm

pixels **p**er **c**enti**m**eter, a measure of resolution. The more pixels per centimeter, the higher the resolution. *See also* ppi, Resolution.

ppi

pixels **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 Capture* employs ICC profiles. *See also* ICC.

RAW image

A photograph taken with the D1 digital camera at an image quality setting of HI-RAW. "Raw," unmodified image data from the camera's image sensor (charge-coupled display, or CCD) are saved in uncompressed form at a pixel bit-depth of twelve bits per pixel. RAW images can only be opened in *Nikon Capture*, and must be saved again in a standard image format such as TIFF or JPEG before they can be opened in another application. *See also* NEF.

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 Macintosh monitors, for example, is 72ppi. 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 72ppi or 96ppi, while printers may have resolutions of 300dpi, 600dpi, 1200dpi, or 2400dpi. *See also* ppcm, ppi.
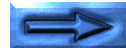
RGB

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 will be output at half their original size.

Speedlight

A brand name for Nikon flashes.

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. Images loaded into *Nikon Capture* are displayed in a thumbnail list in the Thumbnails section of the Camera Image window.

TIFF

Tagged **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 Capture* 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; *Nikon Capture* supports 256 tone levels per channel at a bit depth of eight bits and 4096 tone levels per channel at a bit depth of twelve bits (data with a bit depth of twelve bits are handled internally as sixteen-bit data). The distribution of tones in the image can be seen in the Curves window 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.

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.

White balance

The human eye is able to adapt to changes in lighting, and consequently to humans a white object will still look white whether viewed in direct sunlight or under overcast skies, or indoors under incandescent or fluorescent lighting. A digital camera, in contrast, must adjust colors according to lighting if colors that appear white when viewed directly are also to appear white in the final photograph. This adjustment is called "white balance."

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.