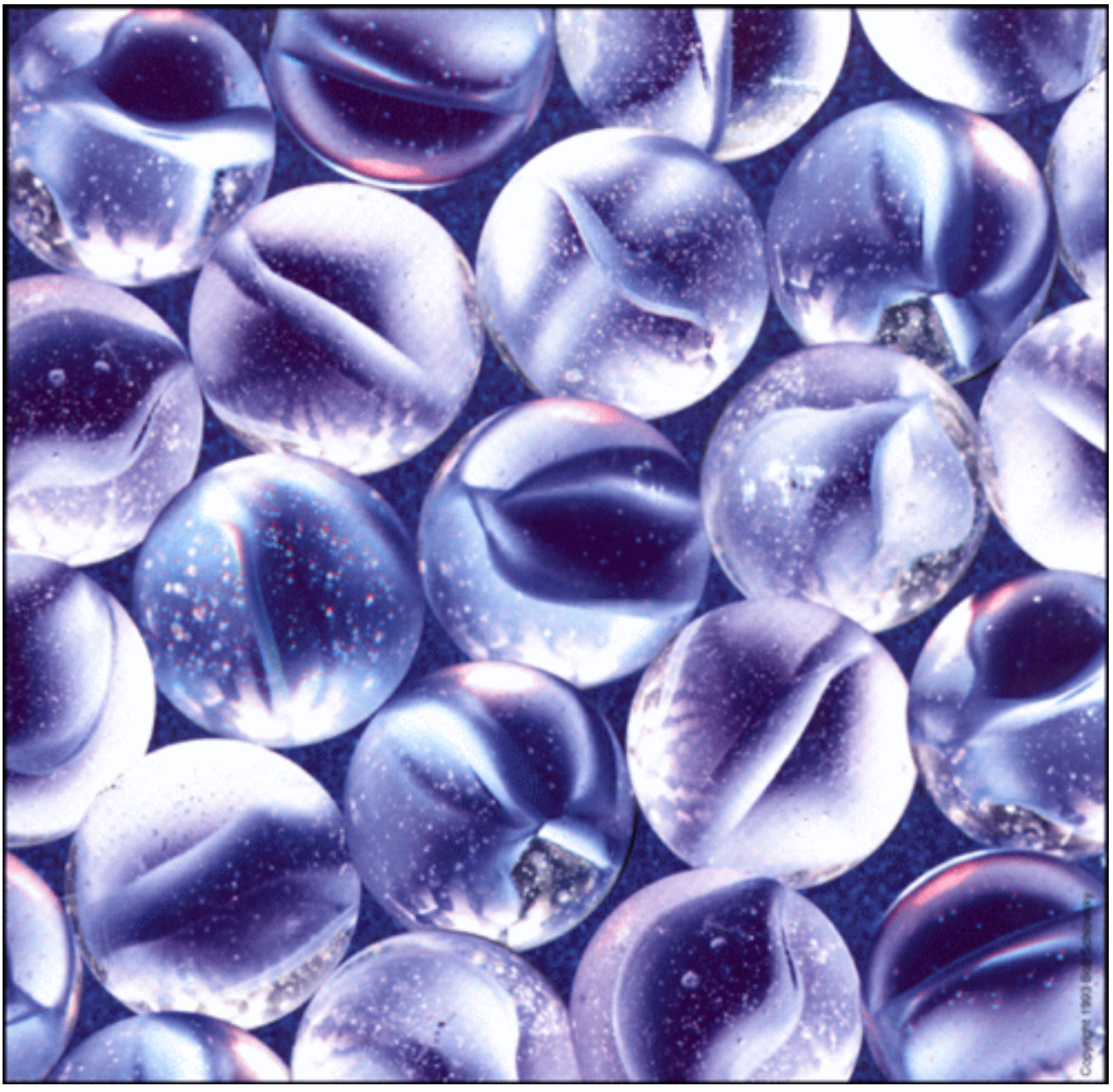

# Leafscan 35/45 Plug-In User's Guide

Version 2.1

# Contents

# About This Manual

## What is this manual about?

This manual teaches you how to capture digital images using the Leaf scan 35 {45 software that accompanies the Leafscan-35 and the Leafscan-45 scanners. Leafscan 35/45 is plug-in compatible.

## What do you already need to know?

Before you read this manual or use this product:

- Install the scanner. (Please see the owner's manual.)
- Install Adobe Photoshop 2.5 or later on the Macintosh. Or install an application that is plug-in compatible.
- Know how to use the Macintosh.

## How do you find information in this manual?

This manual groups together software features that relate to a task. Please see Figure I for a quick summary of where to find information in this manual.

| For information about: | Please read: |
|---|---|
| The plug-in, in general | Chapter 1 |
| How to prepare for a scanning session | Chapter 2 |
| What to do before you prescan | Chapter 3 |
| How to specify the size of a final image | Chapter 4 |
| How to tone a digital image | Chapters 5 & 6 |
| How to create a final image | Chapter 7 |

*Figure 1: Overview of manual*

# Conventions

This manual uses the following conventions:

| Convention | Indicates | Example |
|---|---|---|
| Italic | Word being defined, title, or emphasis | *Leafscan 35/45 User's Manual* |
| Helvetica bold | Command | **File** |
| Helvetica bold with arrow(s) | Command with multiple menu levels | **File ➛ Open** |

*Figure 2: Manual conventions*

# 1

# What Is the Leafscan 35/45 Plug-In?

This chapter provides an overview of Leafscan 35/45, the plug-in that you use to operate the Leafscan-35 and the Leafscan-45 scanners.

## Overview of the Leafscan 35/45 plug-in

The software that accompanies the Leafscan-35 and Leafscan-45 scanners is plug-in compatible. The plug-in is necessary for you to scan and modify digital images. With the scanner and the plug-in, you can capture color and grayscale images of transmissive copy like negatives and slides.

## Overview of workflow

The following tasks provide an overview of how to use the plug-in:

1. Capture a prescanned image of the subject.

   A *prescanned image* is a draft image that you modify before you capture a final image.

2. Modify the prescanned image by giving it a size and changing its tonal qualities.

3. Capture a final image of the subject.

In actual use, each of these tasks consists of several steps, some of which are required and some of which are optional.

## Installing the Leafscan 35/45 plug-in

To install the Leafscan 35/45 Plug-In, drag the plug-in icon into the folder that Adobe Photoshop looks in to find plug-ins. Please see the Photoshop user's manual for instructions.

## Accessing the Leafscan 35/45 plug-in

To access the plug-in from Adobe Photoshop:

1. Turn on the scanner.

2. Select one of the following:

| **If you are using:** | **Select:** |
|---|---|
| GBIB interface | **File ➛ Acquire ➛ Leafscan 35/45 2.1 GPIB** |
| SCSI interface | **File ➛ Acquire ➛ Leafscan 35/45 2.1 SCSI** |

When you access the plug-in, the Main window of the plug-in appears on the screen.

## A brief look at the Main window

When you access the plug-in, the Main window shown in Figure 1-1 appears on the screen:

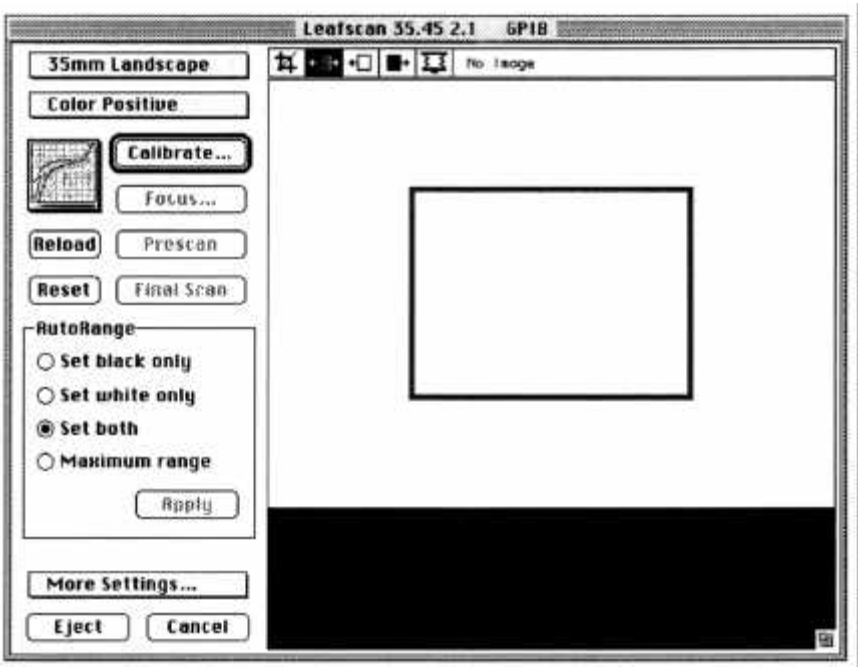


*Figure 1-1: Leafscan 35 / 45 Main window*

From the Main window, you can:

- describe the type of image you want to create (positive or negative, color or grayscale)
- capture a prescanned image
- examine the composition of the prescanned image

- crop the prescanned image
- enter the size of the final image
- access the Tone window
- make a final scan

## A brief look at the Tone window

You can change the tonal qualities of an image in the Tone window, which you access from the Main window by clicking on the Tone window icon shown in Figure 1-2:

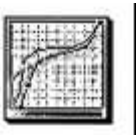

*Figure 1-2: Tone window icon*

Figure 1-3 shows the Tone window:

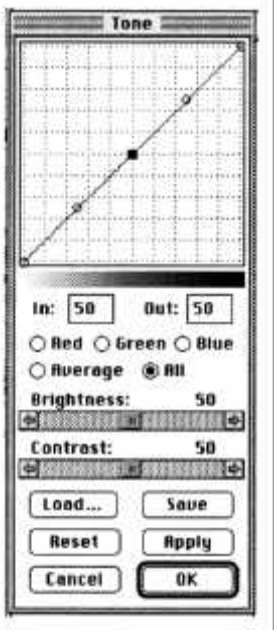


*Figure 1-3: Tone window*

From the Toning window you can modify the following qualities in a digital image:

- color
- brightness
- contrast

You can also save and apply tone curves that you use frequently.

When you exit from the Toning window, you return to the Main window.

## Exiting from the Leafscan 35/45 plug-in

To exit from the plug-in, click Cancel in the Main window.

# 2

# Preparing for a Scanning Session

This chapter describes what to do before you begin to scan images.

## Preparing a working environment

You must establish a level of consistency in the working environment so you can evaluate the quality of the images you capture. Preparing a working environment involves creating an area in which to evaluate images and adjusting the output devices so that they represent the image accurately. This section describes some of the issues involved in preparing a working environment.

## Creating a viewing area

The viewing area is the place where you evaluate images both on the monitor and in print. Having a viewing area helps compensate for the discrepancies in color between the image on film and the image on the monitor.

The most important aspect of the viewing area is the consistency of the lighting conditions in it. A recommended way to view images is:

- under daylight-balanced light
- in a room with subdued lighting

## Preparing the monitor

You must set the monitor to display 24-bit color (**millions**) under **Control Panel➛ Monitors.**

Additional adjustments to the monitor help ensure that the image on film and its digital counterpart look as much alike as possible. After you prepare a viewing environment, adjust the monitor so that the colors you see in an image accurately represent the colors in the subject of the image. How you adjust the monitor is specific to the individual monitor and to the application you are using. Most adjustment methods fall into two categories:

- Hardware - You can adjust the contrast and brightness by turning knobs on the monitor.
- Software - Many image processing application packages let you correct the monitor for color shifts in red, green or blue phosphors.

You should not depend entirely on the monitor to evaluate color and tone. The monitor is more capable than inks of reproducing colors, and may therefore display colors that

cannot be recreated in inks. Monitors also do not represent contrast accurately. In addition, because monitors are analog devices, there may be slight fluctuations in the colors they represent. Despite these limitations, monitors provide a good guideline as to the quality of the image. You should, however, print the image to get a true indication of its quality.

## Selecting film format (Leafscan-45 only)

You select the format, or size, of the film you are scanning only when you use the Leafscan-45. The scanner uses this information to adjust the position of the lens to capture the entire image.

When you use a Leafscan-45, the Film Format feature opens into a pop-up menu, as shown in Figure 2-1:

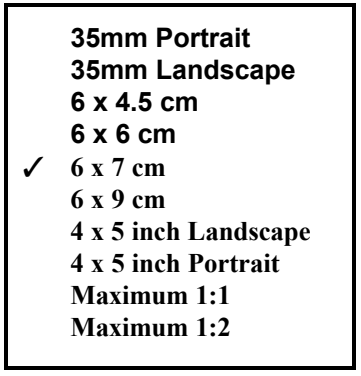


*Figure 2-1: Film Format feature for Leafscan-45*

Select the film size from this pop-up menu according to the film you are scanning. When you release the mouse button, the Film Format box displays the currently selected format.

The Maximum (1:1, 1:2, and 2:1) sizes let you scan at the maximum area attainable at each of the three magnifications available in the Leafscan-45. These magnification settings

can let you capture a smaller portion of a 4x5 film at a higher resolution, or can let you use a custom-made film holder.

Figure 2-2 lists the specifications for the Maximum settings:

| Film Format: | DPI: | Area: | # of Pixels: | Approximate File Size: |
|---|---|---|---|---|
| Maximum 1:1 | 2540 | 6 cm x 12.7 cm | 6000 x 12700 | 228 Mb |
| Maximum 1:2 | 1200 | 12.7 cm x 12.7 cm | 6000 x 6000 | 108 Mb |
| Maximum 2:1 | 5080 | 3cmx 12.7 cm | 6000 x 254000 | 436Mb |

*Figure 2-2: Specifications for maximum film format settings*

## Calibrating the scanner

*Calibration* is a mechanical and mathematical process that occurs in the scanner to compensate for differences in the way the scanner reads light. During calibration, exposure times and ranges are determined.

Calibration is necessary under these conditions:

- about 15 minutes after you turn on the scanner to compensate for bulb drift

  *Bulb drift* occurs when the bulb in the scanner warms up, thereby changing brightness. When the brightness changes, the scanner needs to be adjusted (calibrated) to produce a quality image. Bulb drift occurs most rapidly and radically during the first 15 minutes after you turn on the scanner.

- about every two hours to compensate for bulb drift

- always before you do your first prescan

The **Prescan** button is grayed-out until you calibrate the scanner.

- For Leafscan-45 only: each time you change the film size setting on the **Film Format** pop-up menu (described previously)

## How to calibrate

To calibrate the scanner:

1. Turn on the scanner and wait about 15 minutes for the scanner and bulb temperature to stabilize.

2. (Leafscan-45 only) Select format of film.

3. Click on **Calibrate**.

A prompt reminds you to remove the film holder from the scanner.

4. Remove the film holder, if one is present.

5. Click **OK** in the dialog box.

The calibration process begins. You may see a message telling you to open or close the f-stop of the scanner lens. In this case, adjust the scanner lens as the message suggests and click on **Calibrate** again. When the messages cease, the calibration process ends.

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What happens after you calibrate a Leafscan-35
After you calibrate the Leafscan-35, **Prescan** is enabled.

---

What happens after you calibrate a Leafscan-45

After you calibrate the Leafscan-45, **Prescan** and **Focus** are enabled.

## Cancelling calibration

You may want to cancel calibration if you realize that the film holder is in the scanner or if you discover that the film format setting is incorrect.

To cancel out of the calibration process, press the Apple key and the period(.). After a few seconds, calibration halts.

# Adjusting Exposure

Exposure lets you control the length of time that film is exposed to light through each color filter. The exposure feature lets you compensate for film that is not correctly exposed or processed. Exposure settings also let you reduce scanning time.

You set exposure in the Exposure Time window. To access the Exposure window, select More Settings -*- Exposure Time from the Main window. The Exposure Time window appears, as shown in Figure 2-3:

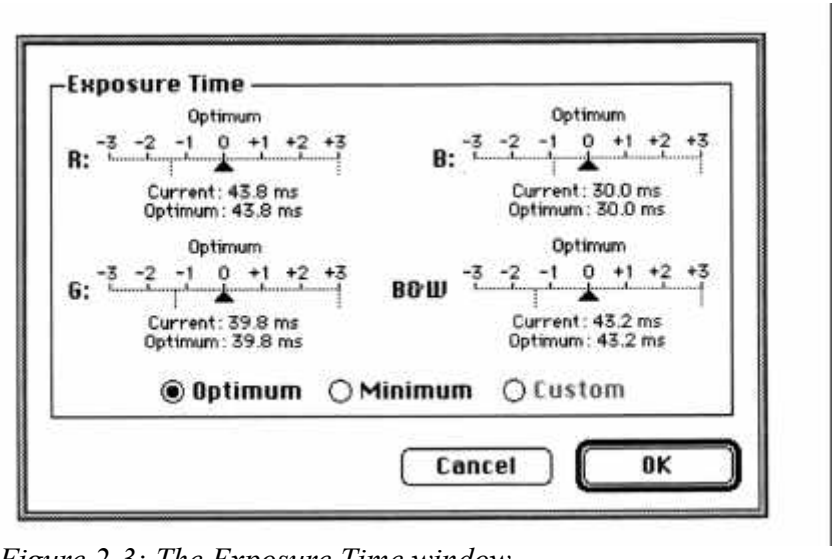



*Figure 2-3: The Exposure Time window*

Exposure settings are interrelated. A change to one setting may affect the others.

## Reading an exposure slider

Exposure values for each filter are recorded on sliders as in Figure 2-4:

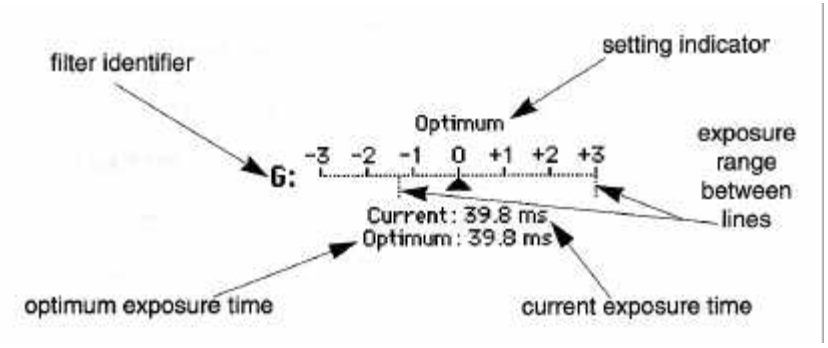



*Figure 2-4: An exposure slider*

The filter identifier indicates the filter that the slider represents:

- **R** (red)
- **G** (green)
- **B** (blue)
- **B&W** (neutral density)

The numbers on the slider, which range from -3 to +3, represent the range of exposure settings. Think of exposure settings as f-stops. Figure 2-5 shows the relationship of exposure settings to actual exposure time in milliseconds.

| Exposure Setting | Exposure Time |
|---|---|
| 0 | optimum time (determined by calibration process) |
| -1 | half the optimum exposure time |
| -2 | one fourth the optimum exposure time |
| -3 | one eighth the optimum exposure time |
| +1 | two times the optimum exposure time |
| +2 | four times the optimum exposure time |
| +3 | eight times the optimum exposure time |

*Figure 2-5: Relationship of exposure settings to exposure time*

The triangle marks the current exposure setting. The triangle is always located between the dotted vertical lines. The dotted vertical lines represent the available exposure range settings for a particular image. The calibration process determines this range.

The **Current** field indicates the exposure time associated with the current setting in the slider.

The **Optimum** field always records the optimum exposure time value of the 0 setting. Zero is the exposure setting that represents optimum exposure time. Optimum exposure time is determined by the calibration process.

The letting indicator is located over each slider.

• If you select **Optimum**, the setting indicator is set to Optimum on all the sliders.

• If you select either **Minimum** or **Custom**, the setting indicator displays a number that indicates the exposure setting, or placement of the triangle on the slider.

## Using Optimum and Minimum exposures

To use either **Optimum** or **Minimum**, click on the radio button next to one of these settings. Try using **Minimum** before **Optimum**. Try **Minimum** and **Optimum** before **Custom**.

### Optimum

**Optimum** sets the exposure of all the filters to zero, the optimum exposure time determined by calibration.

The **Optimum** setting gives the best balance of dynamic range and scanning time.

### Minimum

**Minimum** sets the exposure of all filters to the lowest setting available in the exposure range.

This setting is recommended for most film that does not have exposure or development problems. This setting takes less time to scan than the **Optimum** setting.

The **Minimum** setting slightly reduces the dynamic range of a scan from approximately 3.7 to 3.0 to decrease scanning time. However, the dynamic range of a digital image scanned at minimum exposure may still exceed the dynamic range of the film. As a result, the quality of the digital image most likely remains high, although the amount of time it takes to scan the image is greatly reduced.

## Using Custom exposure

Whenever you drag the triangle on any individual slider, the **Custom** setting becomes active. Use this setting when the

result from the Optimum setting does not produce an image with the effect you want.

## Procedure for setting exposure

To set exposure:

1. **Calibrate** the scanner.
   You cannot set exposure until you calibrate.

2. Select from the Main window:
   **More Settings ➛ Exposure Time**
   The Exposure window appears.

3. Select one of the following exposure settings:

   - **Minimum** - to use the minimum exposure value in the exposure range

   - **Optimum** - to maintain exposure values from the original calibration for all filters

   - **Custom** - to adjust the exposure of each individual filter.

The setting you select remains in effect even after you recalibrate. Try using the exposure settings in this order: **Minimum**, **Optimum** and **Custom**. You may seldom need to use Custom.

# 3

# Preparing to Prescan

This chapter explains the concept of a prescanned image and describes what to do before you capture one. Depending on what you want to accomplish, you may need to do these tasks each time you capture a prescanned image or set up once for a group of images.

## Understanding the prescanned image

Capturing images involves creating and modifying a prescanned image. Once you finish modifying the prescanned image, you can capture a final image that incorporates the modifications you made to the prescanned image.

## What is a prescanned image?

A prescanned image is a low-resolution digital image of the film image. Think of the prescanned image as a draft of the final image. The low resolution saves scanning time and memory, since you do not need high resolution to check the prescanned image for composition, specify its size, or change the tonal qualities. You can modify these characteristics as often as you need on the prescanned image until you get the results you want.

## Why do you need to create a prescanned image?

If you create a final image without first creating a prescanned image, you run the risk of having the tonal values be inappropriate to the image. In the case of a final image, you would not be able to correct the tonal values. You would then have to capture the image again. In the long term, this process is more time consuming than creating and modifying a prescanned image.

A prescanned image serves two essential purposes:

- A prescanned image passes *capture values* to the computer.

  *Capture values* are all the information that the scanner gathers and passes to the computer. Capture values are captured only when you create a prescanned image. Capture values are translated into tones that you see on the monitor. A final image uses only a portion of all the tones that capture values represent. You select the range of tones.
- A prescanned image ensures that the image has a full range of tones through *autoranging*.

  *Autoranging* is a process that lets you select a range of tones from all available capture values.

For more information about capture values and autoranging, please see Chapter 5. (Understanding Digital Toning),

# Setting up to capture prescanned images

This section describes what to do before you capture a prescanned image.

## Sizing the display area of the prescanned image

You can increase or reduce the size of the prescan display area by changing the size of the Main window. To resize the Main window, drag the bottom right hand corner of the Main window. You must set the size of the Main window before you prescan the image. After the prescan is executed and the prescanned image is displayed, you cannot change the display size until the next prescan.

The maximum size of the window is determined by:

- the application memory available at the time you create the image
- the size of the monitor screen

## Selecting the type of final image you want

From the pop-up menu shown in Figure 3-1, you can select the type of final image you want:

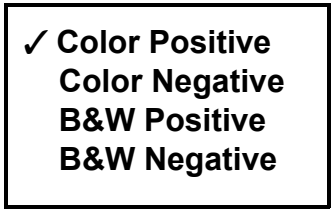



*Figure 3-1: The Final image Type menu*

Figure 3-2 summarizes the ways to use the settings to achieve a variety of results.

| **Image on film:** | **Digital image wanted:** | **Select Setting:** |
|---|---|---|
| color positive | color | Color Positive |
| | grayscale | B&W Positive |
| color negative | color | Color Negative |
| | grayscale | B&W Negative |
| black & white negative | grayscale | B&W Negative |
| black & white positive | grayscale | B&W Positive |

*Figure 3-2: Final image type settings*

## Focusing the scanner (Leafscan-45 only)

Focusing adjusts the position of the optical lens and the camera in the scanner to produce the sharpest digital image possible from the film. FOCUS is available only for the Leafscan-45. When you use a Leafscan-35, FOCUS is grayed-out, because the Leafscan-35 is a fixed focus scanner.

You can focus before or after you create a prescanned image. When you focus before you create a prescanned image, focusing occurs in the center of the image. When you focus after creating a prescanned image, you can select a specific area of the image on which to focus.

To focus before you create a prescanned image, make sure you have calibrated the scanner, and click on FOCUS.

For information about focusing after you create a prescanned image, please see Chapter 4.

# Summary: Capturing a prescanned image

To create a prescanned image:

1. (Leafscan-45 only.) Select the film format. (Please see Chapter 2.)

2. Calibrate the scanner. (Please see Chapter 2.)

3. (Optional) Set exposure. (Please see Chapter 2.)

4. (Optional) Set the image display size.

5. Select the final image type you want from the Final Image Type pop-up menu.

6. (Optional - Leafscan-45 only.) **Focus** the scanner.

7. Click on **Prescan**.

As the scanner captures the image of the subject, the image is displayed on the monitor. Because the image has a low resolution, it may appear soft. A blue box surrounds the area of the image where the autorange selects values.

The plug-in offers features and tools that you can use to enhance the image. Chapter 4 (*Sizing an Image*) and Chapter 6 (*Toning a Digital Image*) describe these features.

# 4

# Sizing and Focusing a Prescanned Image

This chapter describes how to assign a size to and focus a digital image.

## Understanding size in digital images

Digital images have no inherent physical size like images on 35 mm or 4x5 film. You must specify the size of the image in terms of resolution, width, and height. Width and height determine the area and proportion of the final image. Resolution determines the amount of pictorial information within the area.

Figure 4-1 illustrates the concept of size in a digital image:

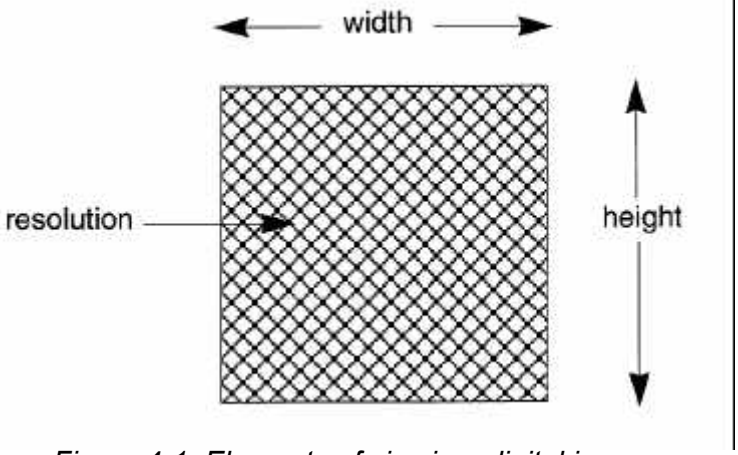



*Figure 4-1: Elements of size in a digital image*

You can crop an image by selecting a part of an entire image. When you crop an image, the plug-in applies width, height, and resolution values only to the cropped area.

The plug-in does an autorange before you crop. Depending on the size and shape of the autorange box, the autorange values may be taken from outside the cropped area.

## Cropping an image

Cropping lets you select a part of the prescanned image that you want for a final image. All modifications made to the width, height, resolution, and tonal qualities of the prescanned image apply only to the area within the Crop box, even if the entire prescanned image is displayed.

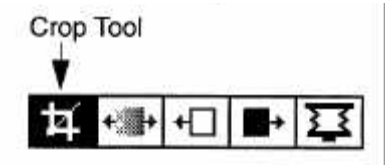
When you capture the final image, only the part of the prescanned image that is within the Crop box is made into a

final image. If you plan to modify the prescanned image, cropping is the first modification you should make.

## How to crop a prescanned image

To crop a prescanned image:

**1.** Click on the Crop tool in the tool palette, as shown below:




**2.** Locate the Crop box:

- If you have just prescanned the image, the Crop Box is located at the very edge of the display area. You may not see it until you click on it.
- If you have reloaded a previously saved prescanned image, the Crop box is in the position it was in when you made the final scan.

**3.** Resize and move the Crop box to a part of the image that you want to be the final image.

- To reduce or enlarge the Crop box:

Position the mouse cursor on a border of the Crop box. The cursor changes to a double headed arrow. Drag the cursor to increase or decrease the size of the box.

- To move the Crop box:

Place the cursor inside the Crop box. The cursor changes into two crossed, double-headed arrows. Drag the cursor until the Crop box is in the position you want.

Remember that all future modifications apply only to the area of the image within the Crop box.

## Isolating the cropped area

You can better visualize the effects of the cropping by isolating the cropped area from the entire image. To isolate the cropped area, hold down the OPTION key. The area outside of the Crop box in the display area turns gray. When you release the OPTION key, you can see the original contents of the display area.

## Creating a prescanned image of the cropped area only

A prescanned image of the cropped area is as large as the original, uncropped image. Creating a prescanned image of the cropped area is recommended because the cropped area is larger and easier to evaluate.

To create a prescanned image of the area within the Crop box:

1. Hold down the *Option* key.

   The area outside the Crop box turns gray. **Prescan** changes to **Cropped**.

2. Click on **Cropped**.

Only the area within the Crop box is captured as a prescanned image.

# Setting the width, height and proportion of the final image

Width, height and the Crop box are interdependent in determining the area and proportion of the final image. The Crop box is located in the image display area. You control the width, height, and proportion of the final image in the Image Size area of the Main window, as shown in Figure 4-2:

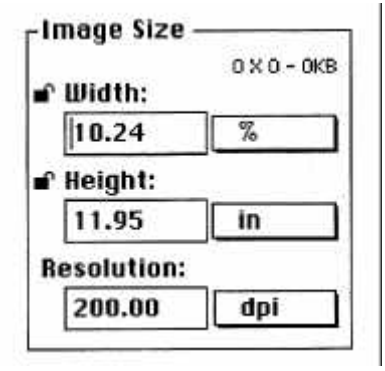



*Figure 4-2: The Image Size area of the Main window*

# Setting Width and Height

Width and Height let you set the area and proportion of the final image. Width is the horizontal measurement of the image. Height is the vertical measurement of the image.

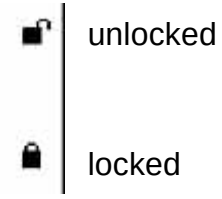
You enter the measurements for both Width and Height in the same way:

1. Select a unit of measurement by clicking on the Units pop-up menu to the right of Width or Height. The abbreviations and their meanings are shown in the following table:

| **Abbreviation:** | **Meaning:** |
|---|---|
| in | inch |
| cm | centimeter |
| mm | millimeter |
| pc | pica/point |
| cc | cicero |
| co | column |
| % | width as a percentage |

**2.** Type the number of units in the box to the left of the Units pop-up menu.

**3.** Lock either **Width** or **Height**, by clicking on the open lock icon next to the dimension. The open lock icon changes from open to closed, as shown below:




- User Tip -

You can type the number of units and the unit measurement directly in the box.The unit measurement automatically changes. For example, when you type **27 mm** in the unit box, the unit of measurement changes to mm without your having to select mm from the pop-up menu.

When you lock either dimension, **Final Scan** becomes highlighted. At this point you can capture a final image of the

area within the crop box, or you may capture another prescanned image of the entire area. Please see page 4-10 for information about combining the Crop box with Width and Height settings.

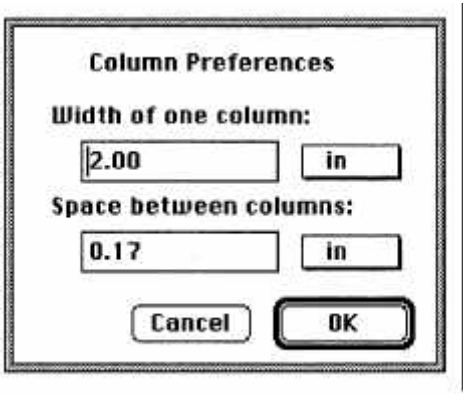
## Using Columns (co) as a unit of measurement

Use columns (**CO**) as a unit of measurement when you want the size of the digital image to fit into a predetermined column size. You may find this feature convenient when you scan images for a newspaper or magazine whose format includes columns. To use columns as a unit of measurement, you set the dimensions of the column and then select **CO** in the Image Size area to represent that dimension.

To set the dimension of the Columns unit:

1. Select **More Settings ➛ Columns**.

   The Columns Preference window appears:




2. Under **Width of one column**, select a unit of measurement from the pop-up menu on the right, and enter the number of units in the box to the left of the pop-up menu.

3. Under **Space between columns**, select a unit of measurement from the pop-up menu on the right, and

enter the number of units in the box to the left of the pop-up menu.

4. Click **OK**.
   The Columns Preference window disappears.

5. In the Image Size area, select CO as a unit of measurement for either Width or Height and enter the number of columns to represent the size of the image.

When you enter I column, the image size is the measurement of a single column. When you enter more than one column, the image size is the measurement of all the columns plus the measurement of the spaces between the columns.

As an example of using **CO** as width, assume that:

- The width of one column is 3 inches.
- The space between columns is .25 inches.
- The image size is 3 columns wide and 10 inches high.

The image size is calculated to fit as shown in Figure 4-3:

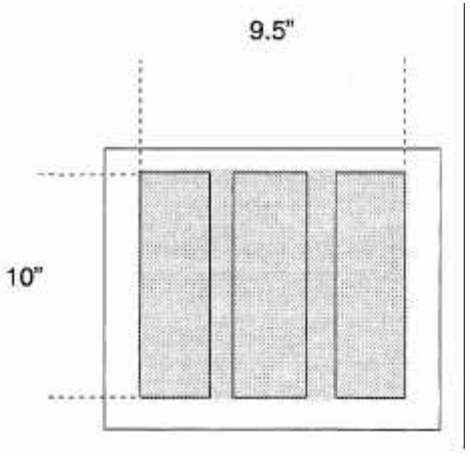



*Figure 4-3: Using columns as width*

As an example of using CO as height, assume that:

- The width of one column is 3 inches.
- The Space between columns is .25 inches.
- The image size is 3 columns high and 10 inches wide.

The image size is calculated to fit as shown in Figure 4-4:

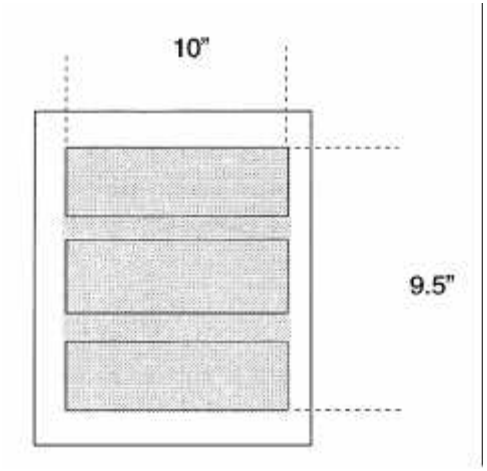



*Figure 4-4: Using columns as height*

## Using a percentage (%) for the width dimension

Use the **%** option to specify the width dimension of a final scan as a percentage of a known size, instead of an absolute measurement. The percent you enter for width is applied to the height to maintain aspect ratio.

If, for example, you are scanning a 4" x 5" transparency and want the size of your final scan to be 8" x 10", select **%** in the Unit pop-up menu, and then enter **200** (%) in **Width**. The final image will be twice as large as the original slide.

The percent figure applies only to the currently cropped area.

# Combining Crop Box, Width and Height Settings

This section describes how to combine the Crop box, Width and Height settings to control the image size and proportion.

The relationship of the Crop box to the Width and Height settings in the Image size area is the following:

- If Width or Height are locked, the crop box maintains the proportion of the locked dimension(s).

- If neither Width nor Height are locked, the Crop box can take any proportion. Once you have the proportion you want in the Crop box, enter and lock a value into either Width or Height. The other dimension updates to preserve the proportion of the Crop box.

## Imposing a proportion on the Crop box

To force the Crop box into a fixed proportion, in spite of its size, lock both Width and Height values. The horizontal and vertical dimensions of the Crop box also lock in the proportion you specify in the Width and Height values. In this case, you can move, enlarge and reduce the Crop box, but you cannot change its proportion by clicking and dragging on its boundaries.

For example, assume the following:

- **Width** is locked at 2 inches
- **Height** is locked at 4 inches

The horizontal and vertical measurement of the Crop box will always reflect the 1:2 proportion that is established by the 2 inches by 4 inches. You can make the Crop box bigger or smaller to capture more or less of the prescanned image, but the proportion of the Crop box remains 1:2 at any size.

### Resizing the Crop box freely

To shape the Crop box into a rectangle of any proportion, do not lock either Width or Height.

When you have cropped the image as you want, enter a value in Width or Height, and lock the value. The other value automatically updates, and the proportion of the final image that you set with the Crop box is preserved.

### Imposing proportion in one dimension of the Crop box

If you lock either Width or Height, the unlocked setting automatically recalculates to maintain the proportion of the Crop box.

For example, assume the following:

- **Width** is locked at 2 inches.
- **Height** is not locked.

The Crop box assumes that its width is always 2 inches, regardless of how wide or narrow it appears on the display area. When you resize the Crop box, the height is recalculated on the assumption the Width is 2 inches.

## Setting Resolution

This section defines resolution and describes how to enter a resolution value.

## What is resolution?

Resolution is a measure of the amount of pictorial information that the scanner reads and that the output device uses to produce a final image. Resolution is measured in dpi (dots per inch) or ppm (pixels per millimeter).

Dots and pixels are two names for the same object, a picture element. In an image, a pixel displays a color that corresponds to a small area in the subject.

## How does resolution affect images?

Resolution does not affect the height or width of an image. You can have a I inch by I inch image with 72 dpi, 100 dpi, 300 dpi, and so on. Resolution does affect the amount of detail that you can see within the area of the image, as shown in Figure 4-5:

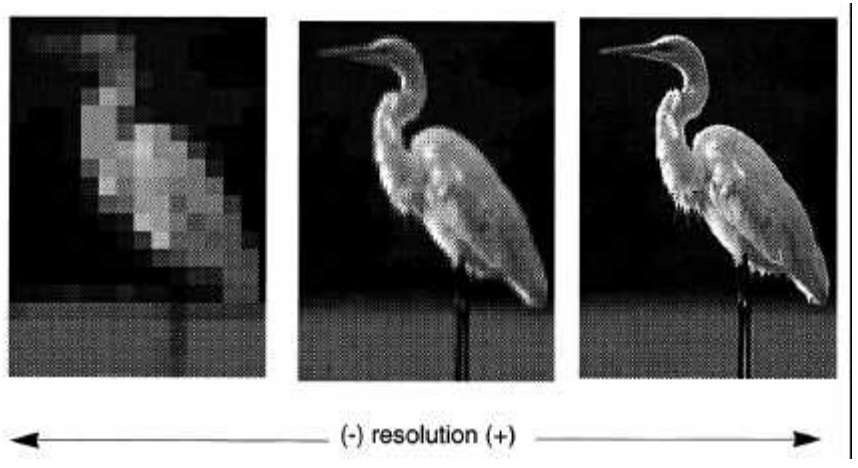



*Figure 4-5: Low, medium, and high resolution images. Photograph courtesy of David Perdew/Stock South.*

In general, an image with low resolution has less detail and more contrast. An image with high resolution has more detail and less contrast.

## How does resolution affect the way an image is displayed?

The scanner, monitor, and printer have different capabilities of representing images with different amounts of resolution (different measurements of dpi).

The scanner captures information at a maximum resolution that depends on the scanner model, selected film format, and magnification. To create a lower resolution, the scanner can force two or more adjacent pixels to act as one pixel. This process is called averaging,

The monitor displays an image at a resolution that is equal to or less than the resolution the scanner used to capture the image. The image still has all the resolution that the scanner used to capture it - the monitor displays only a part of all available information.

The printer also has an inherent resolution. To find the range of resolution that your printer is capable of processing, please read the printer manual. Scan the image at a resolution that is compatible with the printer.

## Entering resolution

To enter the resolution of the final image:
1. Select either **dpi** or **ppm** from the Units pop-up menu at the right of **Resolutio**n.
2. Type the number of units in the **Resolution** box.
Resolution, like width and height values, applies only to the final image.

The maximum amount of resolution that you can enter depends on the width, height and the area within the Crop box. If the resolution you enter exceeds what these values can allow, the plug-in automatically recalculates the maximum resolution at which the scanner can scan. The plug-in then replaces your entry with this value.

## Determining how much disk space a final image requires

The plug-in automatically calculates the amount of disk space that an image requires for storage, based on area and resolution. The larger the area and the greater the resolution, the more space the image requires. To have these numbers automatically calculated, you must lock Width, Height, or both.

This calculation is displayed in the upper right hand corner of the Image Size area, as shown in Figure 4-6.

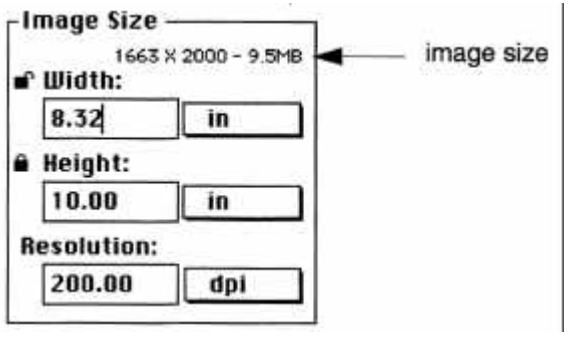



*Figure 4-6: The image size display*

The first number (**1663**) represents the number of pixels in the width of the final image. The second number (**2000**) represents the number of pixels in the height of the final image. The resulting third number (**9.5MB**) represents the total amount of disk space that the final image requires for storage.

# Balancing image quality and size

This section suggests how to combine width, height, cropping and resolution for specific situations.

To have a good balance between the detail in an image and the amount of memory necessary to store the image, you can do a combination of the following:

- Select resolution according to the output device.

- Crop the prescanned image to be as much like the final image as possible.

An efficient strategy for creating a digital image is to prepare the prescanned image to be as much like the final product as it can be before you do a final scan. The following are some effective ways of compromising between image quality and disk space.

## If you know the size of the final image

Set the width and height of the final image before you scan it, rather than cropping it or reducing it after afterwards.

## If you do not need to use the entire image

Select (crop) the part of an image you want and then do a final scan on that part only.

## If you are printing with a halftone screen

If the output is printed in halftones, a factor in determining resolution is the ruling of the halftone screen you use to print the image. A rule of thumb is to double the screen ruling to

get an appropriate resolution. For example: If the screen ruling is 85 lines per inch, use a resolution of 170 dpi.

## If you are calculating image size in pixels for film recorders

Image sizes for film recorders are most accurately calculated in pixels.

To set an image size in pixels:

1. Determine which image dimension is more important to the placement of the image: width or height.
2. Enter I" for the dimension that is more important, either Width or Height, and lock the value.
3. Enter the resolution you require in Resolution.
4. Press TAB to update the value of the unspecified dimension.

   The numbers in the top right corner of the Image Size area show the total number of pixels that will be in the final image. You can now adjust the Crop box to get the exact number of pixels for the dimension that you did not lock.

For example, assume that you want to create a final image and output it to a 4K film recorder. The subject can be of any size. For highest quality, the final image must have 4000 pixels across the width. To get the correct size:

1. Enter I" in Width (the more important dimension), and lock the value.
2. Enter 4000 in Resolution.
3. Press TAB.

The top-right corner of the image size box will have numbers similar to these: 4000 x 3005 = 34.4 MB. You can now adjust the size of the Crop box to get closer to the exact number of pixels that you require for Height.

### If you do not know how the image will be used in the future

If you cannot determine how an image will be used, scan the entire image at the highest resolution you are likely to need.This method works well if you are archiving images whose future use is currently undefined. However, this method does take up more disk space.

The highest resolution at which you can save a final image is 16 bits. To save a final image with 16-bit resolution, select **More Settings ➛ 16 bit.**

When you select the 16 bit format, a check mark is posted beside the setting to indicate that is active. The 16 bit setting remains active until you turn it off.

## Focusing an Image (Leafscan-45 scanner only)

After you have cropped the prescanned image, you may want to focus on a specific part of the image. Focusing adjusts the lens position in the scanner to produce the sharpest image possible.

**Focus** is available only for the Leafscan-45. When you use a Leafscan-35, **Focus** is grayed-out.

When you focus after creating a prescanned image, you can select a specific area of the image on which to focus. (For information about focusing before you create a prescanned image, please see Chapter 3.)

### When to focus

You must focus the Leafscan-45:

- whenever you change film size setting (**Film Format** feature)

  When you select a new film size, the scanner lens and camera board shift to accommodate the size of the new image.

- when you change to a different film holder

  When you change film holders, the thickness of the holder changes the position of the film plane (even if you keep the same film).

- when you change f-stops on the scanner lens
  You may want to focus the Leafscan-45 scanner:

- when a prescanned image or final image seems out of focus

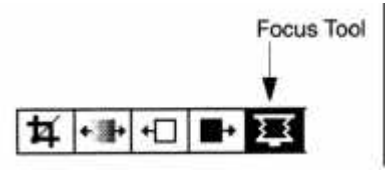
- before each final scan of an image to ensure that the image will be as sharp as possible

- when you have a specific area of the image on which you want to focus

## How to focus on a part of a prescanned image

To focus on a part of a prescanned image:

**1.** Click on the **FOCUS** tool, located in the tool palette:




A green horizontal line appears over the prescanned image. This line represents the area of the image on which the scanner focuses.

**2.** Drag the green line to a part of the prescanned image on which you want to focus - ideally, an area with high contrast. This area should contain some detail.

**3.** Click on **Focus.**

When you first open the plug-in, the default position of the focus line is the center of the image. Once you change the position of the line, focusing continues in the new position until you:

- move the line to a new position
- click on **Reset**
- change the film format

# 5

# Understanding Digital Toning

This chapter describes concepts associated with digital toning as it relates to this product. If you are not familiar with digital toning, this chapter may provide you with the foundation with which to make intelligent decisions about toning.

If you are already familiar with digital imaging, you may want to skim through this chapter and go to Chapter 6, Toning a Digital Image.

## What is toning?

Toning is the process of adjusting the following properties in a a prescanned image:

- contrast

- brightness
- color

You tone a prescanned image by:

1. Selecting the lightest and darkest tones you want in the image.

   The plug-in then automatically calculates the values in-between these points into a 256-value tonal range.

2. Modifying the tones between the range.

These tasks consist of several steps that are described Chapter 6.

## Why do you tone an image?

Toning helps you produce a better image by letting you adjust color in an image. In a digital image, toning also lets you select a range of tones that is appropriate to the image. Selecting a range is necessary because the scanner transfers more tonal data than most computer systems can display. The tonal data is called capture values.

Toning a prescanned image instead of a final image gives you the advantage of being able to work with the capture data instead of a limited 256 range. Working with the capture data gives you a greater dynamic range and more control over the light and dark areas of the image.

Toning a prescanned image eliminates the need for much post-production color correction, which can be time consuming and costly. You can make the color corrections and immediately see the results.

## Understanding capture values and final values

Capture values are all the information that the scanner gathers and passes to the computer. Capture values are gathered only when you capture a prescanned image. Capture values are represented as tones of color or shades of gray on the monitor.

Understanding capture and final values is important because each tone is assigned a numeric equivalent. Because of limitations in the way monitors display color, the numeric equivalent is a more accurate way of determining if a tone is accurate. When you click on a tone in the image, its numeric value is displayed in the densitometer.

The scanner transfers more capture values than most computer systems can display as tones. The scanner gathers 16 bits of capture values. In other words:

- 65,536 tones of red
- 65,536 tones of green
- 65,536 tones of blue

Although all the capture values of the prescanned image are stored in memory, the monitor image displays only 8 bits of the values at one time. In other words:

- 256 tones of red out of 65,536 capture values
- 256 tones of green out of 65,536 capture values
- 256 tones of blue out of 65,536 capture values

The final image inherits only the 256 tones per color that are displayed on the screen. Through autoranging and toning, you can select and modify the range of tones.

## Understanding autoranging

Autoranging is a mathematical process that selects a range of 256 tones from the 65,536 capture values. The 256 values are the tones you see on the monitor. Autoranging works by:

1. determining the lightest and darkest capture values in an area of the image

2. making the lightest value white and the darkest value black

3. graduating all the values in-between white and black

When you capture a prescanned image, the autorange process automatically occurs on the capture values. The lightest and darkest points are automatically selected from within the blue autorange box. The size and position of the box are initially a default. If you do not like the tonal qualities that result from the autorange, you can move the box or use other methods to select a black and white point. (Please see Chapter 6.)

Autoranging permits each range of 256 tones to include highlights, midtones, and shadows. Figure 5-1 on the following page illustrates the concept of selecting a range of tones from capture values.

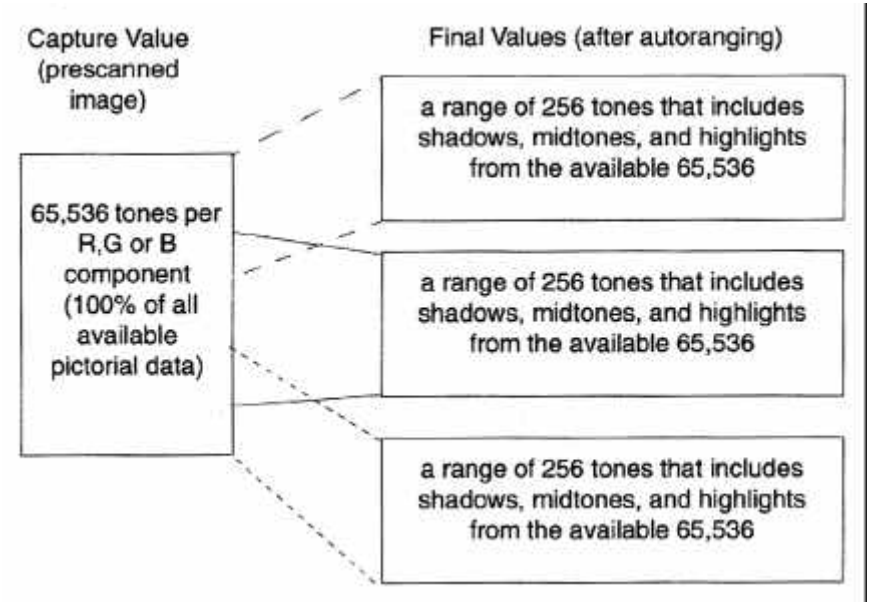



*Figure 5-1: Concept of selecting a range of final tones from capture values through autoranging*

When capture values are converted into final values, the result is that one final value may represent more than one capture value. Figure 5-2 depicts a conceptual representation of a how more than one capture value is assigned to one final image value.

| Capture values: | Final value: |
|---|---|
| 10,291-10,361 | 201 |
| 10,363-10,440 | 202 |

*Figure 5-2: Concept of capture values being converted into final values*

## How do pixels represent color?

This section describes how the monitor represent color through pixels and how the plug-in controls that process.

## How pixels represent tones

The plug-in assigns a component in each pixel to represent a tone. This plug-in assigns each pixel three color components: red, green, and blue. The plug-in then combines these components in different intensities to represent a color. In other words, one color component can represent many tones.

Figure 5-3 illustrates the concept of color in a pixel:

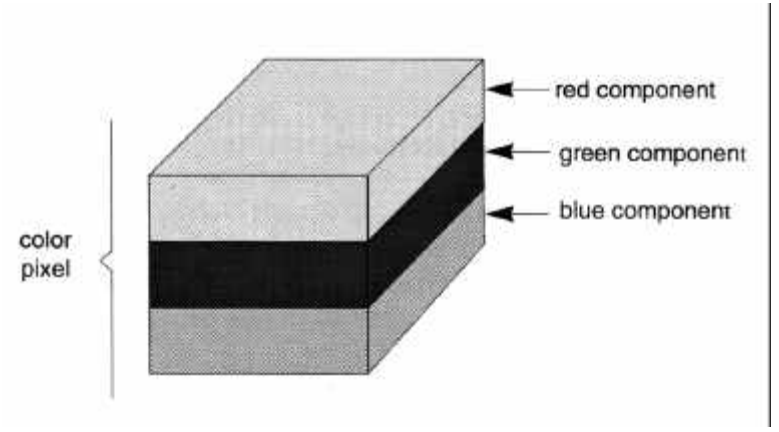



*Figure 5-3: Conceptual illustration of a color pixel. Each component represents many tones of its color. One tone from each component is combined to create a color.*

Each color component in each pixel has a minimum and a maximum value. The darkest tone in each component has the minimum value. The lightest tone in each component has the maximum value.

Figure 5-4 summarizes the values of the different color components when a pixel represents color:

| Tone | Value of color component |
|---|---|
| pure black | All color components have the minimum value. |
| pure white | All color components have the maximum value. |
| color | At least one component has a different value than the other two components. The value may need to be significantly different from the others for the human eye to perceive the color. |

*Figure 5-4: Component values in pixels representing tones*

A pixel in which the red, green, and blue components have the same value is called neutral, or gray.

## How pixels represent shades of gray

In a black and white image, the plug-in assigns each pixel one component that represents white, black, and shades of gray. In other words, the entire pixel becomes one component. Figure 5-5 summarizes the values of the component when a pixel represents shades of gray:

| Shade | Value of component |
|---|---|
| pure black | The component has the minimum value. |
| pure white | The component has the maximum value. |
| gray | The component has a value between the minimum and the maximum, exclusive. The value may need to be significantly different from the others for the human eye to perceive the shade of gray. |

*Figure 5-5: Component values in pixels representing shades of gray*

## What determines minimum and maximum pixel values

The numeric values of pixel components are first determined by how much pictorial information the pixels in the scanner capture and transfer to the computer.

The scanner captures a maximum number of:

- 65,536 values of gray, including black and white in a grayscale image (16 bits per shade)

- 65,536 values of red 65,536 values of green, and 65,536 values of blue in a color image (16 bits per color)

These values are called *capture* values. When pixels represent capture values, the maximum component value is 65,536 (white) and the minimum component value is 0 (black).

Most computer systems can display only 256 tones or shades from the capture values of 65,536 per component. The 256 values are called *final* values (8-bit). When a pixel represents final values, the maximum component value is 255 (white), and the minimum component value is 0 (black).

# 6

# Toning a Digital Image

This chapter describes how to change the tonal quality of a prescanned image. If you are not familiar with digital toning principles, please read Chapter 5.

## Overview of toning tasks

The following tasks are basic to toning:

1. Selecting the endpoints of a tonal range.

2. Modifying the tones between the endpoints.

These tasks consist of several steps that are described in the following sections.

# Selecting Endpoints

Selecting endpoints is the first step in the color correction process. Endpoints are the lightest and darkest tones you want in the final image.

When you capture a prescanned image, endpoints are selected with an autoranging process that occurs automatically. The area from which the endpoints are selected is within the blue autorange box in the image display area. The default position of this box is the center of the image.

If, after the prescanned image is autoranged, you do not like the resulting tonal qualities, you can select another set of endpoints by doing one of the following:

- moving the autorange box to another area of the image
- selecting a light tone and a dark tone manually

## Selecting endpoints with the autorange tool

When you use the autorange tool to select endpoints, you do not have to select two separate tones to represent the lightest and darkest endpoints of the tonal range. The tool automatically selects them from within the area you specify.

### Selecting an area to autorange

Make sure that the area of the image you select for autoranging does not include:

- specks of dust or dirt
- defects in the film or emulsion
- specular highlights or extremely dark shadows

Any of these elements may skew the tonal range that results and make the highlights and shadows difficult to control.

## Selecting how autoranging assigns values to endpoints

The autorange selection area lets you select how you want the autorange process to assign values to the endpoints. Once you choose a setting, all future autorange processes, both manual and automatic, are carried out with that setting until you change the setting again.

The autorange selection area appears in the same place as the Image Size area when you select the autorange tool from the tool palette. The autorange selection area is shown in Figure 6-1:


*Figure 6-1: The autorange selection area*

When you set the film format to either **Color Positive** or **Color Negative**, you can click on any of the settings in the autorange selection window. When you set the film format to either **B&W Positive** or **B&W Negative**, the settings in autorange selection area are grayed-out. The reason is that all settings have the same effect on black and white images.

The settings are described Figure 6-2:

| **Autorange setting:** | **What it does:** |
|---|---|
| Set Black Only | Assigns the darkest tone within the autorange box to black. Any pixel in the image darker than the selected pixel also turns black.<br><br>Few images require this setting. Use this setting when the film image has a true black but no true white. The result will be that the lightest colors retain a color tint, and the darkest color is black. |
| Set White Only | Assigns the lightest tone within the autorange box to white. Any pixel in the image lighter than the selected pixel also turns white.<br><br>Very few images require this setting. Use this setting when the film image has a true white but no true black. The result will be that the darkest colors in the image retain a color tint and the lightest color is set to white. |
| Set Both | Assigns the lightest tone within the autorange box to white. Assigns the darkest tone within the autorange box to black.<br><br>Most photographs fall into this category. If you are not sure as to which setting to use, try the Set Both setting first. Use this setting when the film image has both a true black and a true white. |
| Maximum Range | Allows the lightest and darkest pixels to retain a color tint.<br><br>Very few images require this setting. Use this setting when the film image has neither a true black or a true white. An example is an image taken through a color filter. |

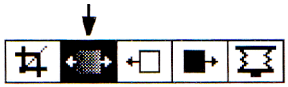
*Figure 6-2: Endpoint settings*

## Using the Autorange tool

To select endpoints and establish a tonal range with the autorange tool, do the following:

1. Click on the Autorange tool in the tool palette, shown below:

Autorange tool



- The blue autorange box appears over the image.
- The Autorange Selection box appears over the Image Size Area of the Main window.

**2.** Resize and move the blue Autorange box to the area of the prescanned image that has the tonal qualities you want.

- To resize the Autorange box, click on a corner and drag the corner.
- To move the Autorange box, click in the center of the box and drag.

**3.** Select a setting from the following in the Autorange Selection box:

- Set Black Only
- Set White Only
- Set Both
- Maximum Range

These settings are described earlier in this section.

**4.** Click Apply in the autorange selection box.

The tonal values in the prescanned image change as specified.

## Selecting endpoints with White Point and Black Point tools

The White Point and Black Point tools are located in the tool palette of the Main window, as shown in Figure 6-3:

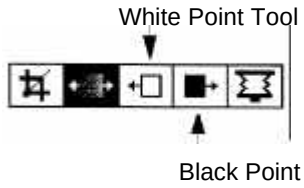



*Figure 6-3: The White Point and Black Point tools of the tool palette*

The White Point and Black Point tools let you manually select a single pixel anywhere in the prescanned image and assign the value of white or black to it, respectively.

This method of selecting endpoints is helpful when the image has a highlight or shadow that is between the light and dark areas you want to select. In this case, using the autorange box may include the highlight or shadow, which throws off the tonal range.

## Understanding the White Point tool

The White Point tool lets you select a pixel and assign the value of white to it. The selected pixel and any pixels lighter in color turn white.

When you use the White Point tool, the lightest endpoint on the tone curve represents pure white. The White Point tool has no effect on the current darkest endpoint. The autorange process graduates between pure white to the current darkest endpoint.

## Understanding the Black Point tool

The Black Point tool lets you select a pixel and assign the value of black to it. The selected pixel and any pixels darker in color turn black.

When you use the Black Point tool, the darkest endpoint on the tone curve represents pure black. The Black Point tool has no effect on the current lightest endpoint. The autorange process graduates between the current lightest endpoint and pure black.

Using the White Point and Black Point tools

You operate the White Point and Black Point tools in the same way:

**1.** Click on the White Point or Black Point tool icon.

The cursor changes to a cross hair when you place it over the image.

**2.** Select a pixel by placing the cross hair over it and clicking once.

The pixel is set to a value of white or black, depending on the tool you selected. The monitor adjusts to the value you selected.

# Modifying the tones in a range

After you select endpoints and the autorange process graduates the tones in between the endpoints, you can modify the tones in that range with the features in the Tone window.

## Accessing the Tone window

To access the tone window, click on the Tone window icon in the plug-in Main window, illustrated in Figure 6-4:

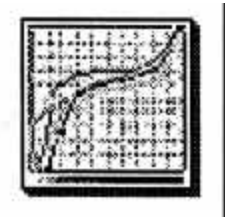


*Figure 6-4: The Tone window icon*

The Tone window appears, as in Figure 6-5:

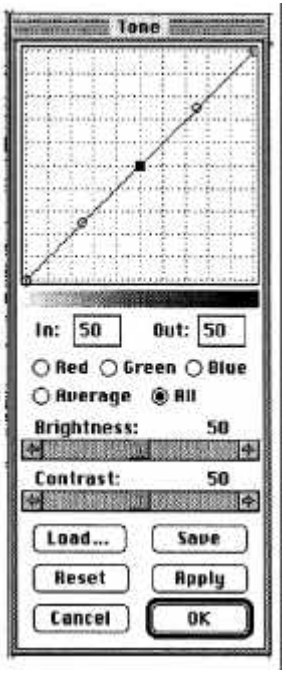



*Figure 6-5: The Tone window*

## Exiting the Tone window

You can exit from the tone curve by clicking on Cancel or OK.

- OK - applies the current tone curve to the image and returns you to the Main window.
- Cancel - returns you to the Main window without applying any of the changes.

## Reading a tone curve

The autorange process is represented by a graph of the tonal values in an image. This graph is called a tone curve. When the tonal values are unadjusted, the tone curve looks like the one in Figure 6-6:

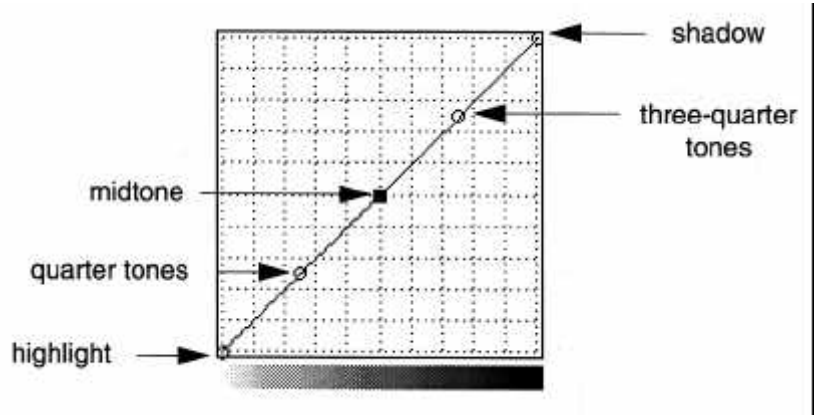



*Figure 6-6: An unadjusted tone curve*

The horizontal axis represents the tonal values of the original image. The vertical axis represents the tonal values of the output image. The bottom left hand corner of the graph represents the lightest point in the image. The top right hand corner represents the darkest point in the image. The line between the endpoints represents all the tones between the lightest and the darkest points. This line also represents how an input value (horizontal axis) maps to its corresponding output value (vertical axis).

The unadjusted tone curve of both color and grayscale images looks like a straight line, as shown in Figure 6-6. When you

adjust the shades of a grayscale image, the resulting tone curve may look something like the one in Figure 6-7.

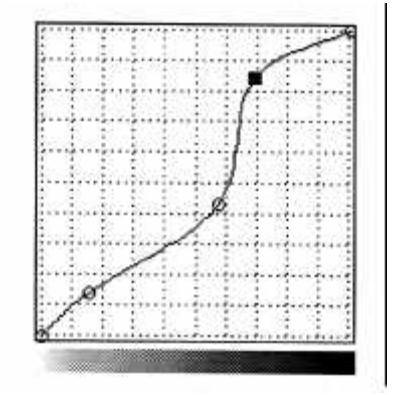


*Figure 6-7: An adjusted tone curve of grayscale image*

When you adjust the shades of a color image, the resulting tone curve may look something like the ones in Figure 6-8.

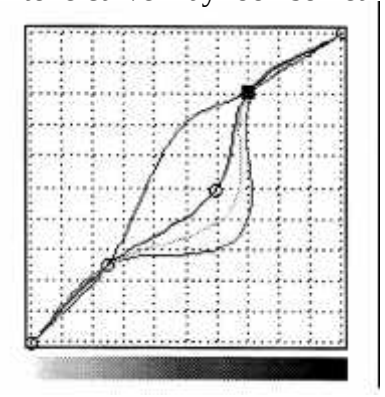


*Figure 6-8: An adjusted tone curve of a color image*

The lines in the color tone curve are color-coded to represent the red, green, and blue components of the image. The black tone curve represents the average of the three components.

All these lines represent the highlights, midtones and shadows of each set of tones that the image comprises.

## Modifying a tone curve

You can change the tonal quality of an image by -modifying tone curves. You modify a tone curve in one of three ways:

- by clicking on and dragging a handle on the tone curve

  A *handle* is a white circle on the line. It turns into a black square when you click on it, indicating that it is active.

- by pressing the arrow keys to move the selected handle one step in the direction of the selected arrow key

- by entering the position of an active handle numerically

### Clicking and dragging a handle

To move a tone curve by clicking and dragging:

**1.** Click on a handle with the mouse button.

The handle changes from a circle to a black square to indicate that it is active.

**2.** Drag the handle to a new position on the graph.

After you release the handle, the image in the display area changes to reflect the modification you made to the tone curve.

The handle remains active until you select another handle.

### Entering a position numerically

The position of the active handle is numerically recorded in the Active Handle Position boxes. You can also enter the position of an active handle in the Active Handle Position boxes shown in Figure 6-9.

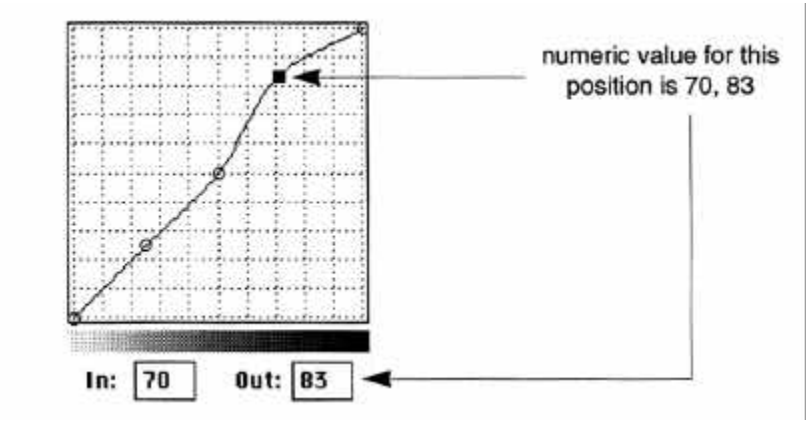



*Figure 6-9: Active Handle Position boxes*

The position box labeled **In** represents the horizontal position of the enabled handle. The position box labeled **Out** represents the vertical position of the enabled handle.

To enter the position of a tone curve handle numerically:

1. Click on a handle to enable it.
   The handle changes from a hollow circle to a black square.

2. Enter an integer between I and 100 in one of the position boxes.

3. Press the ***TAB*** key.

   The active handle moves to the position you entered numerically.

If the values you enter are not within the range of the tonal values, the software selects to the closest values that are within the range.

## Modifying the tone curves of a color image

Unlike grayscale images, which have one tone curve, color images have one tone curve for each color component and one tone curve that represents the average of the color components. You can select and modify any of these tone curves.

Displaying and modifying the average of all color components
Click on **Average**.

The tone curve representing the average of all color components appears on the screen. You can modify the tone curve by clicking and dragging on a curve handle.

Displaying and modifying an individual color component
Click on the color component you want to change:

- **Red**
- **Green**
- **Blue**

The tone curve of the color component you clicked on appears on the screen. You can modify the tone curve by clicking and dragging on a curve handle.

Displaying and modifying all color component at once
Click on **All**.

All the tone curves appear on the screen. You can modify all the tone curves in unison by clicking and dragging a curve handle on the black line.

This option lets you see the effect on all the curves.

# Modifying the brightness of an image

Brightness is a measure of how light or dark an image is. Think of the brightness setting on a television set. If you turn down the brightness, the entire image becomes darker. If you turn up the brightness, the entire image becomes lighter.

You control the brightness of an image with the Brightness slider shown in Figure 6-10:

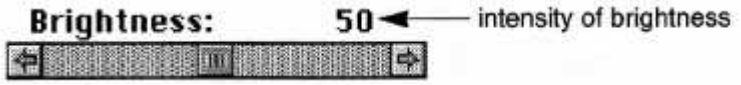



Figure 6-10: The Brightness slider

The number on the right over the slider indicates the intensity of brightness. The number ranges from I to 100.

You can use the Brightness slider by clicking or dragging:

- Click the mouse on one of the arrows at either end of the slider. The brightness increases or decreases by a measure of 1.
- Press and hold the cursor on the square in the middle of the slider, then drag the square to the position you want.

When you click or drag to the right, the image becomes lighter. When you click or drag to the left, the image becomes darker.

# Modifying the contrast of an image

Contrast is a measure of the relationship of light and dark areas in an image. If you increase contrast, the light parts become lighter and the dark parts become darker. When you decrease contrast, the light parts become darker and the dark

parts become lighter. The number on the right over the slider indicates the intensity of contrast. The number ranges from I to 100.

You control the contrast of an image with the Contrast slider shown in Figure 6-11:

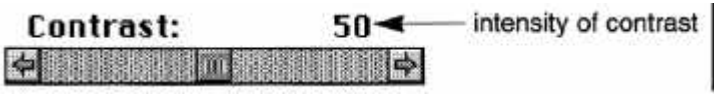



*Figure 6-11: The Contrast slider*

You can use the contrast slider by clicking or sliding:

- Click the mouse button on one of the arrows at either end of the slider. The contrast increases or decreases by a measure of 1.

- Press and hold the mouse cursor on the square in the middle of the slider, then drag the square to the position you want.

When you click or slide to the right, contrast of the image increases. When you click or slide to the left, the contrast of the image decreases.

# Using tone curve utilities

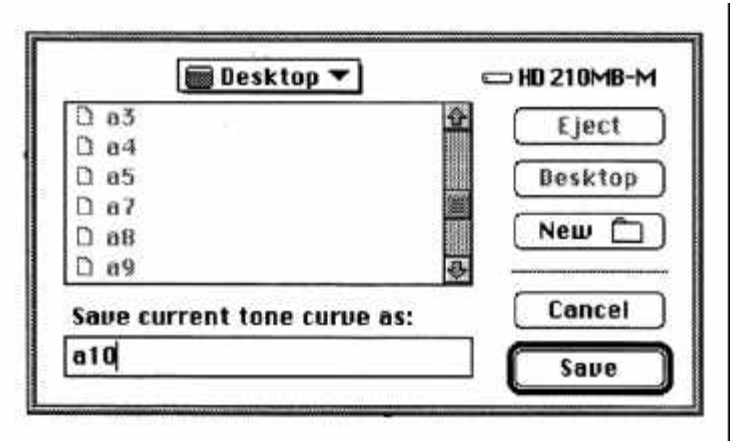
Tone curve utilities are designed to facilitate your workflow and reduce redundancy in the work process.

## Saving a tone curve

You can save a tone curve independently of an image and later apply the curve to another image. You can save the curve with or without the endpoints.

To save a tone curve:

1. Click on **Save**.
   The following window appears:




2. Select a location for the tone curve from the list.

3. Enter a name for the tone curve you are saving.

4. Click **OK**.

## Loading a tone curve

You can load a tone curve that you saved and apply it to the prescanned image in the display area. This feature is useful when you are scanning from a roll of film where all the frames share a common exposure -as in a motor driven sequence. In such a case, all the film images may be similarly exposed and may require the same tonal treatment to get the results you want.

To reload and apply a tone curve, click on **Load**. The window in Figure 6-12 appears:

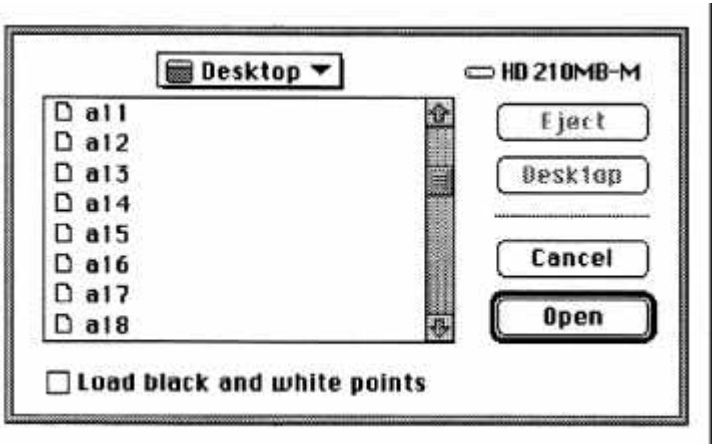



*Figure 6-12: Load window*

In the dialog box, do the following:

1. Click on a tone curve from the list to select it.
   The tone curve becomes highlighted.

2. Check **Load black and white points**, if you want.

3. Click **OK** to apply the tone curve to the image in the display area.

   The tone curve you selected appears in the Tone window.

## Applying a tone curve

Click on **Apply** to give the tonal values in the tone curve to the image in the display area. When you click on **Final Scan**, the image is produced with the tone curve that you apply. When you **Apply** a tone curve, you remain in the Tone window.

You also **Apply** a tone curve when you click on **OK**. In this case, you return to the Main window.

## Resetting a tone curve

Resetting a tone curve straightens the current tone curve.

To reset a tone curve, click on **Reset** in the Toning window.

# Using the Densitometer

This section describes the plug-in densitometer display.

## What is a densitometer?

In traditional photography, a densitometer is a device that measures density of inks and emulsions and reports the density in numeric values. Density represents the degree of darkness in an area.

A digital densitometer is a software tool that measures and displays the values of pixel components in terms of capture and final values. You may elect to convert the pixel values into a more traditional densitometer reading (for example, between 0.0 and 4.0). Using a densitometer is more reliable than gauging by eye whether a tone that is displayed on the monitor has a specific value.

When you place the mouse cursor in the image display area, the cursor acts as a densitometer and displays readings in the area to the right of the tool palette.

The basic steps to using the digital densitometer are:

1. Setting the densitometer to read and display values the way you want.

2. Using the densitometer to get readings.

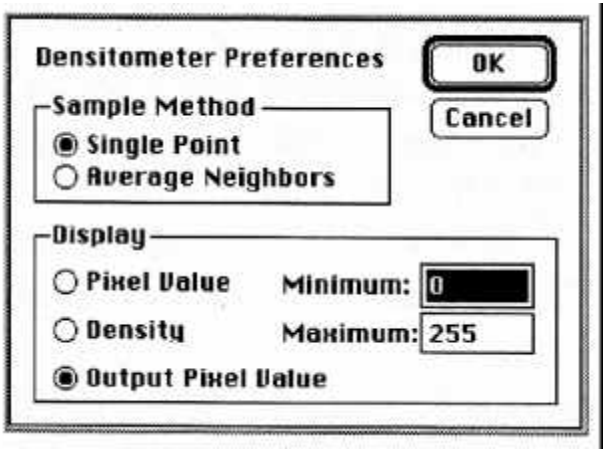
## Setting the densitometer

You can set the densitometer to:

- read the values of either a single pixel or the average of a 3 x 3 patch of pixels
- display readings in terms of pixels or density value

To set the densitometer:

**1.** Select More **Settings** ➛ **Densitometer**. The following window appears:




**2.** Under **Sample Method**, select how you want the densitometer to read values by clicking on one of the following:

- **Single Point** - displays reading of the single pixel the cursor is on
- **Average Neighbors** - displays the average of a 3x3 patch of pixels

**3.** Under **Display**, select how you want the readings to be displayed in the Densitometer Display area by clicking on:

- **Pixel Value** - displays the reading in terms of capture values

  This reading is independent of any toning you have applied to the image. The default minimum is 0 and the default maximum is 65535.

- **Density** - displays readings in terms of traditional density values. Recommended entries are 0 for minimum and 4.0 for maximum.

- **Output Pixel Values** - displays final values (8 bit RGB values similar to those measured in Photoshop after you create a final image). This reading is calculated from the image you see displayed. Density readings include the effects of any toning you have applied.The default minimum is 0 and the default maximum is 255.

4. Under **Display**, enter the range within which the readings are displayed:

   - **Minimum** - the lower end of the range
   - **Maximum** - the upper end of the range

5. Click **OK**.

When you move the cursor inside the image display area, the display you have selected appears on the right of the tool palette.

## Understanding densitometer readings

This section shows examples of ways that you can display digital densitometer values. To see the densitometer readings, look at the far right of the Tool Palette.

## Densitometer set to display density

Figure 6-13 shows densitometer values in terms of density:

R/C: 0.03 G/M: 0.03 B/Y: 0.03

*Figure 6-13: The densitometer set to display in terms of density*

The numbers represent the density reading for the pixel or patch of pixels under the cursor.

## Densitometer set to display output values

Figure 6-14 shows densitometer values in terms of output values, or final values:

R/C: 33.55 G/M: 33.55 B/Y: 33.55

*Figure 6-14: The densitometer set to display in terms of output values*

The numbers represent the final value reading for the pixel or patch of pixels under the cursor.

## Densitometer set to display pixel values

Figure 6-15 shows a densitometer display when the image is in color and the densitometer is set to display values in pixels.

RED: 1414 GREEN: 2103 BLUE: 2244

*Figure 6-15: The densitometer set to display in pixels*

### Densitometer set to display values in a grayscale image

Figure 6-16 shows a densitometer display when the image is grayscale and the densitometer is set to display values in pixels.

GRAY: 2176

*Figure 6-16: The densitometer set to display in pixels for grayscale image*

## Updating densitometer readings when toning

When the tone window is open, and you make an adjustment to toning, you must click on Apply to update the densitometer reading.

# General guidelines for toning images

How you tone an image depends on the effect you want to achieve. However, the following is a recommended order of using the toning tools:

1. Select the endpoints by using the following tools in the following order:
   - Autorange tool - If the first autorange does not produce the effect you want in the image, move the autorange box to another part of the image.
   - White Point and Black Point tools - You can do an autorange and then use both/either the White point or the Black Point tool to fine-tune the tonal range.
2. After you select the endpoints of a range, use the following tools to further modify the tones:
   - Tone curve

- Contrast slider
- Brightness slider

The order in which you use the toning tools is not as important as the aspect of the image you are trying to modify.

# 7

# Creating a Final Image

This chapter describes how to create a final image and some additional steps that let you control image storage and acquisition.

## Creating a final image

To create a final image, click on **Final Scan.**

This single step is the culmination of the modifications you have made to the prescanned image.

## Before you remove the film holder…

After you scan, but before you remove the film holder, click on **Eject** in the Main window to prevent damage to the scanner.

The **Eject** button centers the film holder in the scanner opening. This feature is important because the scanner works by moving the film holder back and forth. When the scanner finishes scanning, it may leave the film holder in a position that may prevent you from pulling it out of the scanner.

**Eject** works differently on the Leafscan-35 and on the Leafscan-45. On the Leafscan-35, the **Eject** button centers the film holder, making it ready for you to pull it out of the scanner. On the Leafscan-45, the **Eject** button centers and moves the film holder out of the scanner.

## Reloading a saved prescanned image

After you click on **Final Scan**, the software automatically saves the prescanned image under the filename Leafscan Image File in the same directory in which you installed the plug-in.

To retrieve and display the prescanned image, click on **Reload** in the Main window.

**Reload** retrieves the prescanned image and all the information associated with it when you clicked on **Final Scan**. This information includes:

- position of Crop box
- width and height values
- resolution
- type of film format

- toning information
- position of focus line (Leafscan-45 only)

# Troubleshooting

If you are having problems with the software or the scanner, please call your Leaf Systems representative. The service representative may ask you to look at the Scanner Information window. This window contains diagnostic information that a customer service representative needs to help you solve problems with the software or the scanner.

To access the Scanner Information window, select **More Settings ➛ Scanner Info**. The Scanner Information window appears, as in Figure 7-1:

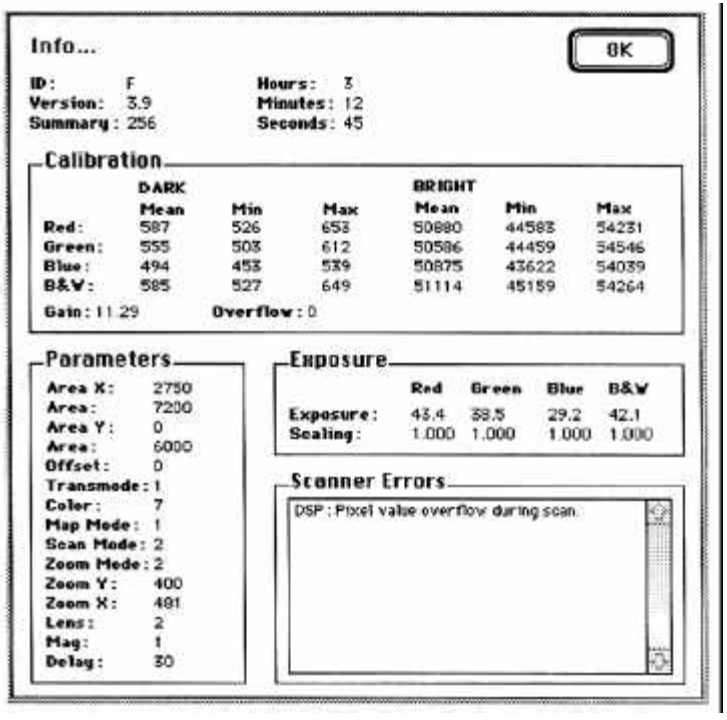



*Figure 7-1: Scanner Information window*

# Error messages

Figure 7-2 lists some error messages that you may see when you are capturing prescanned and final images

| **Error Message:** | **What To Do:** |
|---|---|
| Can't save prescan image this time. | Remove files from the disk and capture another prescanned image. The disk is full or the Leafscan image file is locked or corrupted. |
| Can't load the prescan image from "Leafscan Image File". | Capture new prescan. The Leafscan image file is missing or corrupted. |
| There is not enough memory available to open Leafscan now. Please close some windows and try again. | • Save and close some of the pictures on the monitor.<br>• Highlight the Photoshop icon, then select Get Info from the Finder. A minimum of 5120k must be allocated to the application. |
| Scanner problems detected. Please see "Scanner Info..." for more details. | Select Scanner Info from the More Settings menu to view additional error messages. Check this table for information about what to do. |
| Camera: Not enough light at CCD for calibration. Or, below legal limit. | • Remove lens cap and film holder from scanner.<br>• Open the lens by setting a lower number (f/4 is wide open). Leafscan-45 only.<br>• Clean colored filters (air).<br>• Perform lamp controller adjustment. Leafscan 45 only.<br>• Replace the bulb, then perform lamp controller adjustment |

*Figure 7-2: Leafscan 35/45 error messages*

| **Error Message:** | **What To Do:** |
|---|---|
| Camera: Subrange gain out of range. | • Clean colored filters (air).<br>• Perform lamp controller adjustment. Leafscan 45 only. |
| Camera: Too much light at CCD for calibration. | • Close the lens by setting a higher number (not more than f/8). Leafscan 45 only.<br>• Perform lamp controller adjustment. (Leafscan 45 only.) |
| DSP: Pixel value overflow during scan. | Ignore this message unless artifacts appear in the scan. |
| Lamp: Controller fault or bad lamp. LS 45 only | • Remove lens cap and film holder from scanner.<br>• Clean colored filters (air).<br>• Perform lamp controller adjustment. Leafscan 45 only.<br>• Replace the bulb, and then perform lamp controller adjustment. Leafscan 45 only. |
| Please move the green focus line to a different area. Leafscan 45 only. | Move the focus line only if image is blurry (that is, fuzzy or "under water"). |

*Figure 7-2: Leafscan 35/45 error messages*

# Leafscan-45 quick reference

This section is a quick reference about how to capture a final image with the Leafscan-45.

## Leafscan-45: Once per session

1. Acquire LS 35/45 Plug-In.
2. Select format of film.
3. Calibrate the scanner.
4. (Optional) Set Exposure.
5. (Optional) Focus.

## Leafscan-45: Once per image

1. Select type of output image.
2. Capture a prescanned image.
3. (Optional) Crop and size image.
4. (Recommended) Create a prescanned image of the cropped area.
5. (Optional) Focus.
6. (Optional) Tone prescanned image
7. Capture a final image.

# Leafscan-35 quick reference

This section is a quick reference about how to capture a final image with the Leafscan-35.

## Leafscan-35: Once per session

1. Acquire LS 35/45 Plug-In.
2. Calibrate the scanner.
3. (Optional) Set Exposure.

## Leafscan-35: Once per image

1. Select type of output image.
2. Capture a prescanned image.
3. (Optional) Crop and size image.
4. (Recommended) Create a prescanned image of the cropped area.
5. (Optional) Tone prescanned image
6. Capture a final image.

# Index

## Numerics



**A**



**B**



**C**

## G



## H



## I



## L



## M



## N

## O



## P

## R



## S



## T



## U

# Leafscan 35/45 Plug-In, Version 2.1

Part Number: 99422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