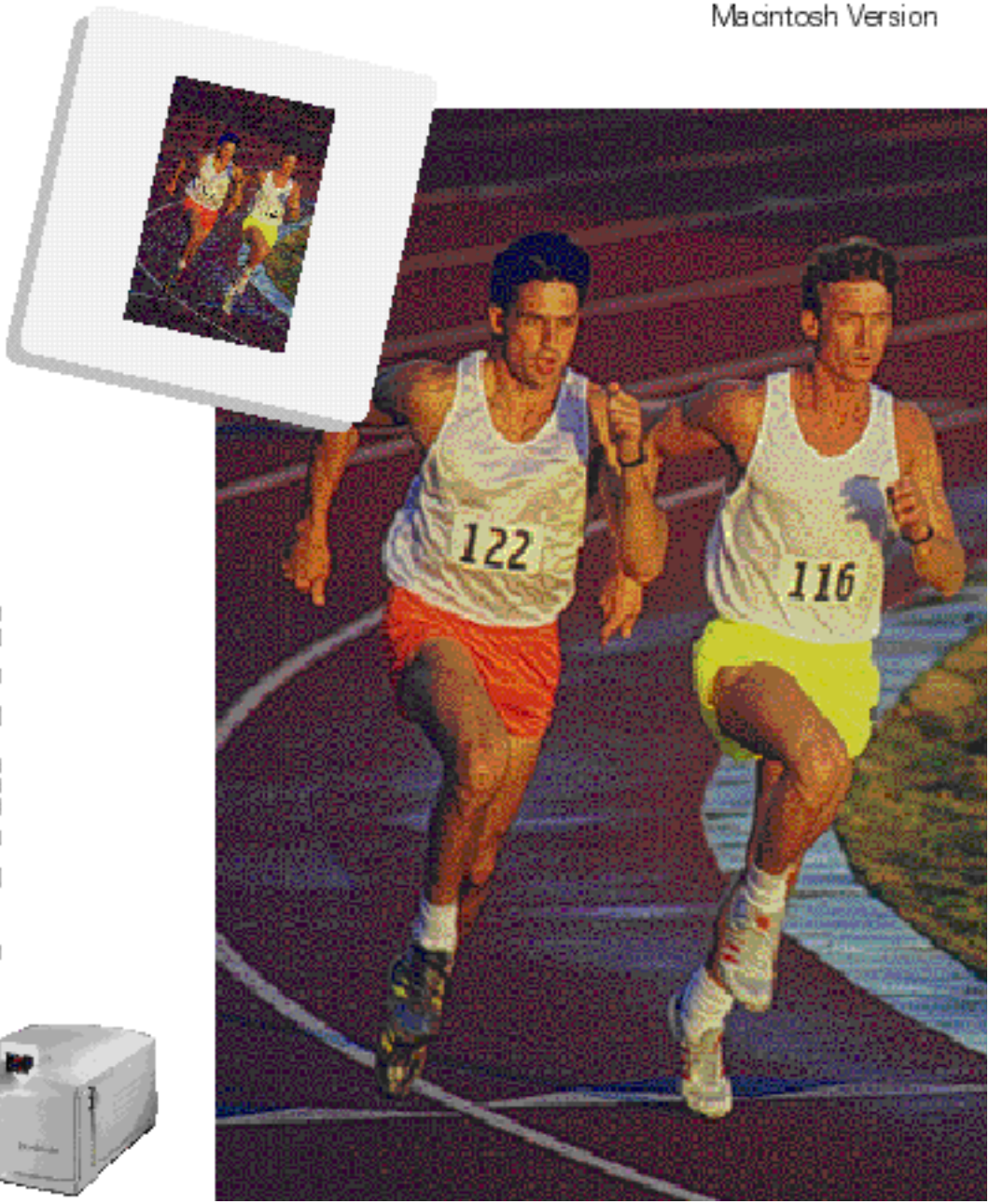
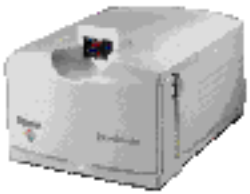
SprintScan 35

User's Manual
Macintosh Version



Polaroid



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Quick Scanning Guide

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		Use this guide as a quick reference for scanning.
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1-3		2 Install the SprintScan software, then restart your computer as instructed.
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2-1		4 Open the SprintScan plug-in by choosing File, Acquire.
2-2		5 Insert your original. Place a mounted slide in the top access slot, or place an unmounted slide or filmstrip negative into the filmstrip carrier and insert the carrier into the side access slot from the right.
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2-11		14 Click the Scan button. The original is lowered into the scanner again. All the settings you have specified apply to the final scan. The scanned image then appears in your imaging application.

1 Installation

The SprintScan 35 software for Macintosh is an Adobe Photoshop plug-in module that automatically transfers final scans into Adobe Photoshop or other compatible software, or saves final scans directly to disk.

First, connect your scanner to your computer as described in your scanner hardware manual. Then, install the SprintScan 35 software as described in this chapter.

The software features real-time sharpening options, and tone and color correction. Recent improvements to the software include:

- Automatic maximum sizing of the preview window
- Simplified, efficient scanning features
- Adjustable tone curve control
- Auto highlight, shadow and contrast
- Gray balance correction
- Enhanced user interface controls, such as one-click controls
- Support for the SprintScan 35 Plus scanner

System requirements

Minimum

- A Macintosh II family, Quadra family, PowerPC or Powerbook computer (use appropriate Powerbook SCSI cable as required)
- System 7.01 or later
- 12 MB of RAM
- A 256 (8-bit) color monitor
- Adobe Photoshop v3.0.4 or later, or Adobe Photoshop plug-in-compliant software

Recommended

- A PowerPC computer
- System 7.53 or later
- 32 MB of RAM
- A 24-bit color monitor
- Adobe Photoshop v3.0.4 or later

SprintScan plug-in

The SprintScan plug-in requires:

- Free disk space: Three times the image size
- 4 MB of RAM in addition to the requirements of the application

Note: Application memory is the amount of memory available for the application after the system has started. The imaging application should have enough memory (combined RAM and hard disk memory) to allow for about three times the maximum image size you plan on scanning. This means you should have the minimum memory plus enough memory for the maximum scan size. Note that the maximum scan size depends on the images and resolutions you want to scan. For example, scanning a 35mm slide at 500 dpi resolution requires about 1.2 MB of memory. Scanning the same slide at 1950 dpi requires 18 MB of memory, and at 2700 dpi, about 32 MB of memory, which means utilizing the hard disk.

If you do not have the minimum required configuration for using the SprintScan 35, contact the dealer from whom you purchased your computer system.

Installing the software

Before you install

A folder for Plug-ins must be on your system for the installation of the plug-in module. This folder should have been included when you installed the Adobe Photoshop or compatible application. If you do not have a Plug-ins folder on your system, see the user guide to your application. Note: The SprintScan Plug-in requires 4MB of RAM beyond the normal application requirements. To accommodate the plug-in, you may need to increase the amount of RAM allocated to your application.

Upgrade customers

If you are upgrading from a previous version of SprintScan 35, do a full install as described below, not a Custom install. As part of the installation, the new install program will move your old SprintScan 35 Preferences Folder to the trash.

Installation

1. **Insert the SprintScan installation disk into a floppy drive.**
2. **Open the disk, if its contents are not already visible.**
3. **Be sure to read any Read Me First file included on the disk.** The Read Me First file contains important late-breaking product information that may affect installation and use.
4. **Double-click the Installer icon to open the Installer program. Note:** If you are using a PowerBook 5300 computer, click the Installer icon "for PowerBook 5300 owners" to install a version of SprintScan 35 that is designed to avoid problems with older versions of that computer.
5. **Click Continue on the Polaroid screen.**
6. **Click the Install button to install the full program, even if you are upgrading from a previous version.** To reinstall selected parts of the software, click Custom and make your selection.
7. **The system will prompt you to select your Plug-ins folder.** Double-click to open folders until the folder containing Plug-ins is selected. For example, in Adobe Photoshop, open the Plug-ins folder and highlight the Acquire/Export folder.
8. **When installation is complete, click Restart.** If you have upgraded from a previous version, empty the trash. To startup the SprintScan 35 software, see page 2-1.

Technical Support

Before you call, have ready the following information:

- The model of your computer, including the kind of processor, and the amount of RAM you have
- The model and serial number of your SprintScan 35 (located on the bottom or rear panel of the scanner)
- A list of other devices attached to your system, such as CD-ROM drives, printers, external hard disks, and other SCSI devices
- A list of any special cards and drivers that you are using, along with any system extensions (see the Extensions folder in the System folder)
- Other applications you are using
- A description of the problem and the wording of any error messages on your screen when the problem occurs

Run a system diagnostic

We recommend you run a system diagnostic utility to provide detailed information about your system before you call.

Call us

You may call Polaroid toll-free from within the U.S.A. at 1-800-432-5355, or fax the information about your problem to 1-617-386-9688, Monday through Friday, 8 A.M. to 8 P.M. Eastern Time. We offer a variety of Customer Support Services; call us for details and applicable fees. You may also write to Electronic Imaging Technical Support, Polaroid Corporation, 565 Technology Square 3B, Cambridge, MA 02139. In Canada, call toll-free at 1-800-268-6970. Outside North America, contact the Polaroid office nearest you (see pages 4-9–4-10).

Internet support

Technical Support is also available over the Internet. Connect to our web site at: http://www.polaroid.com

Registration card

Be sure to fill out and mail your registration card. As a registered owner, you'll receive information about software updates and about the availability of new scanning products from Polaroid.

2 Scanning

Starting up the software

The SprintScan 35 system uses a Photoshop-type plug-in module, which you installed in Chapter 1, to capture image data. You must open your application to access the plug-in.

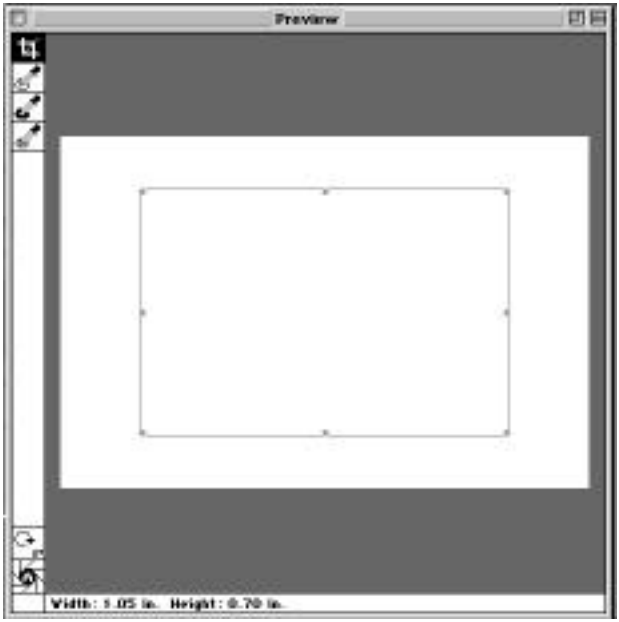
1 **Turn on your scanner, then your computer.**

2 **Open Adobe Photoshop (or a compatible application).**

3 **Choose Acquire from the File menu.**

4 **Choose SprintScan 35.**

The SprintScan 35 windows will appear.



Inserting originals for scanning

The scanner can accept 35mm slide transparencies without removal from the mounts. You can also scan unmounted slides and 35mm filmstrips using the filmstrip carrier included in the accessory kit. See the instructions provided with your scanner for inserting a slide or filmstrip. Remember that the filmstrip carrier moves in one direction, from right to left. If you go past the image you want, remove the carrier all the way from the left side and then insert it again from the right.

When you choose either the Preview or Scan commands, the SprintScan scanner automatically moves the slide down for scanning and then returns it to the start position when scanning has been completed.

With your original in the scanner and the SprintScan 35 window visible on your screen, choose some basic settings (see the next section). Then preview the image and make adjustments if necessary before your final scan.

The SprintScan plug-in provides you with files containing predetermined settings for popular film types, both negatives and positives, to produce an accurate and satisfactory scan. You also choose whether you want your image scanned in color or grayscale, and the resolution for the final scan.

Film

The film type files provide basic settings that should give satisfactory results for most popular slide transparencies and film negatives. The generic default files can be used if your film doesn't appear in the list.

Note: If you do not see film types other than the defaults—Color Slide, Color Negative, and Black & White Slide—then the film type files have not been installed correctly in the Preferences folder. Reinstall the Preferences folder using the Custom install option (see page 1-3).

To choose a film type:

- **Open the Film pop-up menu and choose the name of the film you are using.** The name of the current film type appears as the selected pop-up menu item.

Type

Your choice of image type depends on what sort of reproduction you want to make from an original: color or grayscale. To choose an image type:

- **Open the Type pop-up menu and choose color or grayscale.**

View

You may choose portrait or landscape orientation, or the SuperSlide format (36x36mm). In portrait orientation, height is greater than width; in landscape orientation, width is greater. The default is landscape orientation.

- **To change orientation, open the View pop-up menu and choose Portrait or Landscape.** The image area in the plug-in dialog box will change accordingly.

Note: If you want to change the film type, image type, or orientation after making a preview scan, you'll need to make a new preview scan.

Note about the SuperSlide format: Be sure you do not use the SuperSlide format with traditional slides. If you do, SprintScan 35 scans the area equivalent to the SuperSlide format. This results in part of the slide mount appearing in the Preview window. This affects any corrections you make to the slide.

Output resolution

You can scan an original at a number of output resolutions, ranging from 144 to 2700 dpi. The pop-up Resolution menu lists the *native resolutions,* those that give you the best results. Non-native resolutions may be selected by choosing Other and typing the resolution you want.

The resolution you choose applies only to the final scan. Preview scans do not reflect output resolution, but instead use the resolution appropriate for the screen. To choose an output resolution:

- **Open the Resolution pop-up menu in the Output box and choose the resolution value you want, or choose Other to type a value.**

The final scan size takes into account the output resolution, the scale factor, and whether only native resolutions can be used, as set in the Preferences dialog box. (See Chapter 3 for information on preferences).

A preview, sometimes called a *prescan,* is an image scanned at low resolution and stored in the scanner's internal memory buffer, which has a 1 MB capacity. The preview image also appears in the image area of the SprintScan 35 window. Working with the preview image, you can select an area of interest using the cropping controls, and you can also change the resolution of the image for the final scan.

The plug-in controls also allow adjustments to the preview image's tone, color, and sharpness without requiring you to re-scan the original (these advanced settings are discussed in Chapter 3). When everything is the way you want it, you then choose Scan to capture the data and transfer it to your application.

To make a preview image:

1 **Position the original in the scanner and choose initial settings.**

Insert the film upside down with the emulsion side facing the back of the scanner. (See the hardware manual for more information.)

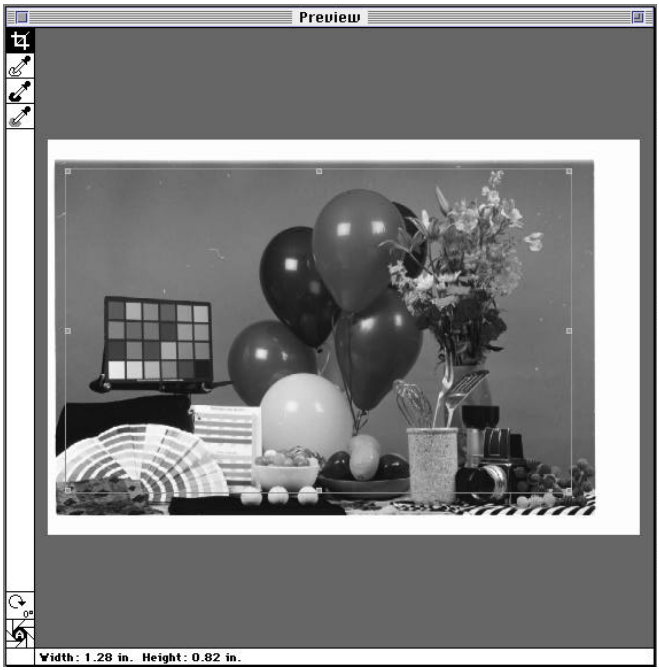
2 **Click the Preview button in the SprintScan 35 window.**

The original is drawn into the scanner and the image is scanned for the preview. While the scanner is working, the ready light will be off.

Scanning takes only a short time. After the preview scan is completed, the original returns to the start position, the ready light glows steadily, and the preview image appears in the preview window, as shown in the following figure.

Maximized Preview

The SprintScan 35 software lets you get the most of your computer's display by making its preview window as large as possible. It detects the size of your display and automatically scales the preview window to the largest display possible. If you normally use two monitors, you can use your second monitor as your preview window.



Working with the preview image, you can adjust the image's exposure, area of interest, designate the size of output and scaling, if desired, and change the resolution for your output scan. (You can change other image characteristics as well, such as the tone, color, and sharpening, and see the result almost instantly—see Chapter 3 for details.)

Preview rotation

The SprintScan 35 software has a rotation icon that lets you rotate the preview image in increments of 90º clockwise. The rotation is retained by the software when you perform the final scan. This saves you time because you don't have to rotate the image in your image processing application.

Cropping the area of interest

The part of an image that you want to capture is termed the *area of interest*. Use the selection rectangle in the image area to center on the area of interest and to omit the unwanted parts of the image from the final scan. (If you are not sure how you will want the final image cropped, scan the entire image area and crop it later using the tools in your application.) To adjust the area of interest:

1. **Click the cropping tool, if it is not already selected.**
2. **Move the pointer into the image area.** The pointer changes shape depending on its placement.
3. **Change the rectangle's shape, drag it around, or create a new rectangle.**

When you change the area of interest, the width and height values in the status bar below the image area and in the boxes inside the Output box change accordingly. These two sets of values are the same if the percent shown in the Scale To box is 100%. The values in the status bar below the image always indicate the size of the rectangle in the image area.

Constraining the aspect ratio

You can constrain the cropping tool to the width and height ratio of your choosing. When constrained, the selection rectangle is kept to the proportions between width and height that you have set. To constrain the tool:

1 **Double-click the Cropping tool.** The Crop Setup dialog box appears.

2 **Click the Constrained Aspect Ratio button to select it.**

3 **Enter the ratio you want between width and height.** Note that the numbers you enter are not units of measure, but an expression of the width versus the height. For example, the value 3 for width and 2 for height means that regardless of the actual size of the area of interest, the width-to-height ratio is 3:2.

4 **Click OK.** Now when you drag the selection rectangle, the aspect ratio will be maintained. The actual values in units of measure at a particular resolution value can be viewed in the Output box.

Opening the dialog box again and selecting Normal returns the controls to their unconstrained state.

Auto Exposure

If the button has no A in the middle of the shutter graphic, click the button to readjust the brightness and contrast of the image. The software estimates the best contrast and brightness values for your original. This feature can often give you excellent output results without your having to manipulate settings yourself.

Note: If the button has an A in the middle, the option has been turned on for every scan as a default in the Preferences dialog box; see pages 3-18–3-19. Auto Exposure has already been applied to your image.

Setting output size and scaling

The Width and Height values in the Output box reflect the output size of the area of interest at a particular scale value. To change the Width and Height values manually:

- **Select the value in the Width (or Height) box and type a new value.**

  The scaling value in the Scale To box changes accordingly. Notice also that the value in the Height (or Width) box is also adjusted. The adjustment of the scaling and the other dimensional parameter is necessary to maintain the proportions of the area of interest within the selection rectangle.

  You can change the units of measurement by choosing Preferences from the Edit menu. Your choice of units may depend on your final output. Pixels is the unit most often used for screen display, and inches for printed output.

Fixed size

If Constrained Aspect Ratio is selected in the Crop Setup dialog box, the Fixed Size checkbox is available for selection. When Fixed Size is selected, the *output* width and height measurements, as you have entered them, are kept constant, as well as the aspect ratio between them being constrained. The Scale To value changes to reflect the scaling required to give the fixed width and height values. This feature can be useful if you want to fit an image into an existing space.

You can also change the scaling value manually. For instance, you might want an enlargement of your area of interest. To change scaling:

- **Select the value in the Scale To box and type a new value.** The values in the Width and Height output boxes change accordingly. The proportions of your designated area of interest are retained.

Changing Resolution

You can change the resolution for a final scan before or after making a preview scan.

- **To change the output resolution, select a new value from the Resolution pop-up menu.**

  Changing the resolution will not cause any visible change on the screen. The change is reflected in the final scan output.

Size

The SprintScan 35 software can display the file size of the final image in megabytes, MB, or kilobytes, KB. Click on the file size in the main window to toggle between MB and KB. If the file is less than 1 MB, SprintScan 35 displays it in KB.

Making a final scan

When you have completed the adjustments, make the final scan. The scanner will again scan the original, and this time the image will be transferred into your application.

To make a final scan:

1 **Make your final changes to settings, as described in the previous section.**

2 **Click the Scan button.**

The original will again be drawn into the scanner. Even at highest resolution, scanning takes a relatively short time.

After scanning has been completed, the image is transferred to your application. To work with your image further, see the user's guide for your application.

To learn about advanced image modification using the plug-in, go on to Chapter 3.

The Scan to Disk option

Scan to Disk

When you use Scan to Disk, you do not have to use your image processing application to name and store the image file you are scanning. Scan to Disk stores the file on the hard drive while it is performing the scan.

1 **Select Scan to Disk from the Image menu.**

2 **Enter a name for the image in the dialog box.**

3 **Click Save.** The SprintScan 35 software scans and stores the image all in one step, saving you time.

3 Advanced scanning settings

This chapter describes how to fine-tune the SprintScan 35 Plug-in module settings for a particular purpose or for unusual input or output. Although the standard settings and film type files described in Chapter 2 produce satisfactory results for most images, you can go much further with image alteration and enhancement. Feel free to experiment.

The advanced settings involve manipulating the tonescale for input vs. output variations, changing the exposure and color saturation of an image, setting white point, black point, and gray point, and adjusting the sharpness of an image. You can also save your customized settings and use them with other images.

See chapter 4, *Troubleshooting*, for tips on fixing common problems.

When to use advanced features

Here are some situations in which you might use the advanced features of the SprintScan 35 software:

- To compensate for an original that is poorly exposed, or that has unacceptable color balance or focus
- To design customized settings and save them as a settings file for a specific type of original or output device
- To optimize an image, that is, to alter image values for the best visual results.

Using advanced settings controls requires some understanding of the terminology and of how the settings interrelate. Because you can see the results of a change immediately, you'll learn best how these settings work by trying them yourself. The next section summarizes the relationships between the controls. The sections that follow describe use of each control.

Image adjustment: the basics

When you preview an original, the system inputs the original data values obtained by the scanner during prescan. To make corrections, you use the advanced controls to change the output values for the final scan, relative to what the scanner "sees" initially as input values. You can compensate for exposure, saturation, and sharpening faults so that the output is better than the original from which you take the image.

Exposure

The concept of exposure as used in the scanner is similar to photographic exposure. The exposure control allows you to increase or decrease the total amount of light available to the image. Increasing the light can increase detail in an underexposed image, and decreasing the light can increase detail in an overexposed image.

By changing the exposure of an image one channel at a time, it is possible to shift the color balance of an image. For example, an image with an overall pinkish cast can be adjusted so the whites in the image look white and the mid-tone channels look neutral (not dominated by any one color).

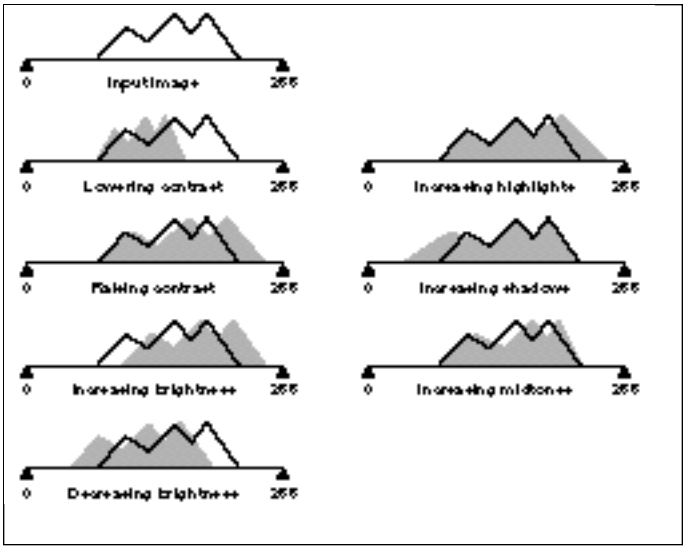
Contrast, brightness, and other tone-related features

Contrast, as the term implies, refers to differences between the lightest and darkest areas of an image. Low contrast is characterized by a grayed-out appearance, where the difference between lightest areas and darkest areas is not great. High contrast gives a stark appearance—light areas are very white and dark areas very black. In the SprintScan 35 system, the red, green, and blue (RGB) channels of the image data are evaluated in terms of a scale where 0 is the darkest end of the range and 255 is the lightest.

White point and black point settings are another way to alter the range. By setting a white point, you define a light area of an image as having the value of pure white. By setting a black point, you define a dark area as having the value of pure black.

Brightness, highlights, shadows, and midtone (gamma) corrections all affect the tone of an image. Increasing brightness increases the amount of light in the image as a whole. Increasing the value of highlights (setting a white point) makes values at the light end of the scale lighter, and decreasing the value of shadows (setting a black point) makes dark values darker. Increasing midtones lightens values in the midrange of the scale.

The figure that follows shows a graphical representation of variations on the dark-to-light scale of values.



When working with color, the same idea applies; however, when you are working with only one color at a time, the changes result in differences in color casts in portions of the image. Brightening a color makes it more apparent, and darkening it makes its complement more apparent.

Color saturation

Color saturation is the degree of intensity, brilliance, or purity of a color. Saturated colors are eye-catching, even loud. Unsaturated colors are more gray or washed-out looking. Increasing the saturation of a color makes it, and its complement, more intense, even if there is not much of that color in the image, relative to the others.

Here's an illustration of how saturation is different from tone: Increasing the value of blue in the color saturation settings causes blue and its complement, yellow, to be intensified. Decreasing the value of blue would cause both blue and its complement to become less intense, or grayer. By comparison, increasing blue in the tonescale settings makes *all* colors become more blue; decreasing blue would make all colors become more yellow.

Sharpening

In images with light and dark areas, edges exist where adjacent areas change suddenly in tone or color. These may be edges of actual objects or color transitions on a single object, such as in a checkered tablecloth. The SprintScan system increases sharpening by enhancing the difference in values between the adjacent areas, even improving the sharpness over that of the original. Blurring decreases the difference.

Even in relatively smooth areas in an image, small differences may exist, such as those between individual white threads in a white square on a checkered tablecloth. These “flat” areas can become grainy looking if sharpening is done on the image overall. To avoid this effect when it’s not desired, options are included for sharpening only edges, leaving “flat” areas unenhanced.

Correcting an image

A good strategy is to start with the Exposure dialog box to correct the overall luminance and color, then use the Contrast/Brightness or the Tonescale dialog box to adjust contrast and midtone values. Finally, use the Saturation dialog box to adjust the color intensity. Sharpening is fairly independent of the others and depends more on the final scan resolution and output device (printer or monitor) than on a particular image.

Auto-Highlight

The Auto-Highlight feature makes it easier to find an image's fullest tonal range by finding its lightest point. After finding the lightest point, the SprintScan 35 software adjusts the image accordingly.

Before using Auto-Highlight, preview an image and choose an area of interest that contains the value that you would like to be the lightest point in your image. Frame this area of the image with the marquee.

- **Choose Auto-Highlight from the Image menu.**

  Auto-Highlight finds the lightest point inside the marquee. The SprintScan software makes it the brightest point in your image, and adjusts the entire image based on the new highlight. Now you can move the marquee to the section of the image you want to scan and then scan the image.

Auto-Shadow

Similar to the Auto-Highlight feature, Auto-Shadow finds an image's fullest tonal range by finding its darkest point. After finding the darkest point, the SprintScan 35 software adjusts the image accordingly.

Before using Auto-Shadow, preview an image and choose an area of interest that contains the value that you would like to be the darkest point in your image. Frame this area of the image with the marquee.

- **Choose Auto-Shadow from the Image menu.**

  Auto-Shadow finds the darkest point inside the marquee. The SprintScan software makes it the darkest point in your image, and adjusts the entire image based on the new shadow. Now you can move the marquee to the section of the image you want to scan and then scan the image.

Auto-Contrast

Auto-Contrast combines the effects of the Auto-Highlight and Auto-Shadow features. Auto-Contrast finds an image's fullest tonal range by finding the image's lightest and darkest points and adjusts the image accordingly.

Before using Auto-Contrast, preview an image and choose an area that has a tonal quality that you like. Frame this area of the image with the marquee.

- **Choose Auto-Contrast from the Image menu.**

  The SprintScan software adjusts the entire image based on the area in the marquee. Once you have adjusted the image, you can move the marquee to the section of the image you want to scan and then scan the image.

Auto-Expose

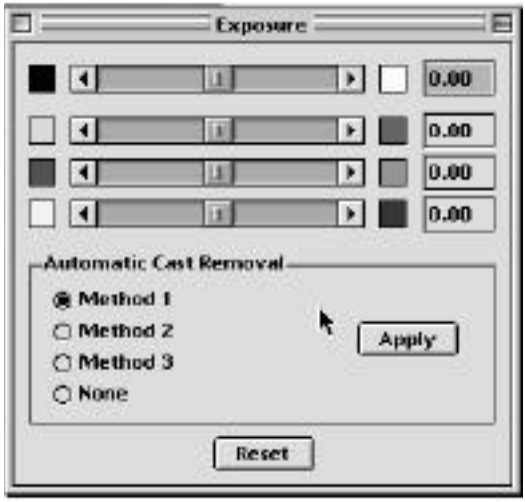
The Auto-Expose option on the Image menu is identical to the icon in the Preview window (see page 2-9). When selected, the plug-in estimates the best contrast and brightness values for an image, based on the area of interest.

For example, if an area of the image has the levels of brightness and contrast that you want, select the area with the crop box and select Auto-Expose (or click the button with the shutter icon). The software will then readjust the rest of the image based on the selected area. In many cases Auto-Expose will give you acceptable results, without having to make corrections to individual brightness, tone and contrast controls.

- **Choose Auto-Expose from the Image menu.**

  To turn Auto-Expose on for every preview scan, see page 3-19.

- **From the Image menu, choose Exposure to display the Exposure dialog box.** It offers features that simplify exposure control for all film types and that automate color cast removal for negatives.



The Exposure dialog box contains several options for correcting under or overexposed originals. There are Color Balance controls for red, green, and blue. The top slider adjusts all three at once, which shifts the overall darkness and lightness of the original.

You can use the Automatic Cast Removal buttons to fix an objectionable color cast in negatives. There are three methods for removing a color cast in negatives. The best method depends on the image you are scanning and the image content enclosed by the cropping frame. If you do not like any of the methods, you can click the None button and no automatic color cast removal is applied.

The image is updated automatically when you change exposure settings.

Tip: Increase or decrease the exposure until the brightest parts of the image are correct. If darker areas of the image still need to be lightened, use the Gamma control in the Contrast/Brightness dialog box. Increasing the exposure too much results in a loss of detail in the whites.

You can reset the exposure values to their defaults at any time by clicking the Reset button.

Setting a white, black and gray point

White point

When you set a white point, you pick a light area of the image that you want to have the lightest value; that is, that point is made white.

To set a white point:

1 **Click the white point eyedropper button, with the icon of an eyedropper with white ink.** The cursor changes to an eyedropper tool.

2 **Move the eyedropper tool over a light area that you want to designate as the white point of the image.** The RGB values of the pixel under the tip of the eyedropper are displayed in the status bar.

3 **When the eyedropper is over the pixel you want as the white point, click.** All color component values are changed to the value 255 (pure white). Values in the rest of the image are adjusted accordingly.

Retain cast: Hold down the Option key when you click with the eyedropper to lighten the values while retaining the color cast. The values of the color components are increased proportionately.

Black point

The Black Point tool has a similar effect, but at the other end of the scale. When you set a black point, you assign a dark area of the image the darkest value—that point is made black.

To set a black point:

1 **Click the black point eyedropper button, with the icon of an eyedropper with black ink.** The cursor changes to an eyedropper tool.

2 **Move the eyedropper tool over a dark area that you want to designate as the black point of the image.** The RGB values of the pixel under the tip of the eyedropper are displayed in the status bar.

3 **When the eyedropper is over the pixel you want as the black point, click.** All color component values are changed to the value 0 (pure black). Values in the rest of the image are adjusted accordingly.

Retain cast: Hold down the Option key when you click with the eyedropper to darken the values while retaining the color cast. The values of the color components are decreased proportionately.

Gray point

The gray point tool lets you choose a neutral point in the image by which the rest of the image can be adjusted.

To set the gray point:

1 **Click the gray point eyedropper button, with the icon of an eyedropper with gray ink.** The cursor changes to an eyedropper tool.

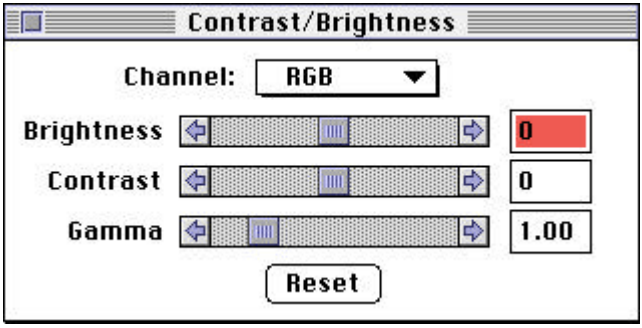
2 Move the eyedropper tool over an area of the image that you want to make neutral. The RGB values of the pixel under the tip of the eyedropper are displayed in the status bar.

3 Click to designate the gray point. The SprintScan software neutralizes the point by adjusting the brightness levels, then adjusts the values in the rest of the image accordingly.

As you use the controls to vary different components of an image, you'll see the results almost instantly in the preview window. To make changes to brightness, contrast, and midtone (gamma) values:

- **Choose Contrast/Brightness on the Image menu.**

The use of each of the controls in the Contrast/Brightness dialog box is described in the sections that follow. The Reset button undoes any changes you make and resets the sliders to their values as stored in the settings file.



Brightness control

Moving the Brightness slider increases or decreases the overall amount of light in the image. Output values increase as the slider moves toward the right. Use the Channel pop-up menu to alter values for all colors (RGB) or for individual color channels (Red, Green, Blue). (If you are scanning in grayscale, the only active choice in the menu is Black.) Brightening a color makes it more apparent. Brightening green, for example, will make the entire image appear green, while dimming green will make the image appear more magenta (magenta is the complement of green).

Contrast control

Moving the Contrast slider alters the contrast between dark and light areas. High contrast, at the right end of the slider, makes everything look starkly black and white; low contrast makes everything look gray. As with the Brightness control, you can vary all color channels or individual channels using the Channel pop-up menu, if you are scanning in color.

Gamma control

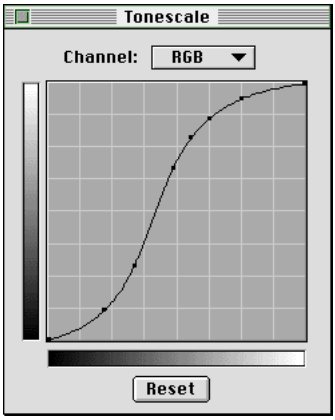
The tonescale curve is a graph of input values against output values. The gamma (γ) value is an exponential value controlling the shape of the curve. When the curve has an upward bow in it, the midtones (middle range) of the output have been brightened compared with the input. This effect of brightening midtones is an approximation of how human eyes see images.

A gamma value of 1 results in a straight line. As you move the Gamma slider to the right, the tonescale curve bows increasingly upward, indicating brightening of the the midtones. Use the Channel pop-up menu to choose all color channels or individual channels. With an individual color selected, moving the slider to the left has the effect of removing that color compared to the other two and heightening its complement. For example, if you choose the blue channel and move the gamma slider to the left, the image will appear more yellow.

Adjusting the tonescale curve

The Tonescale dialog box lets you change the highlights, midtones, and shadows of an image separately by adjusting the tonescale curve. To display the Tonescale dialog box:

- **Choose Tonescale from the Image menu.**



The lower left corner of the scale represents the darkest values, and the upper right corner is the lightest values. The horizontal axis represents input from the original, and the vertical axis the output. At the top is a pop-up menu from which you choose which channel components to modify: RGB reflects all color components taken together. Red, Green, or Blue shows only the curve for that particular component. If you are scanning in grayscale, the only active choice in the menu is Black. Note: When you adjust a curve for a single color, you are effectively changing the color balance.

The Reset button sets the curve to its initial value.

- **To adjust the curve, click a point on the curve to create a control point, then move the point to reshape the curve.** The Preview window immediately reflects the adjustments you make to the curve. There is no limit to the number of points you can create. To delete a point, move it on top of an existing point; they become one.

Saturation refers to the intensity or brilliance of a color. You can change the saturation using the controls in the Saturation dialog box. The Reset button sets all sliders to their initial values or the values stored in the settings file.

1 **Choose Saturation from the Image menu.**

2 **Drag the sliders to change the values; the individual sliders control the red, green, and blue values respectively.**

The saturation settings can give you brash or subtle color effects, as you choose. Note that the saturation settings have no effect if you are scanning in grayscale.

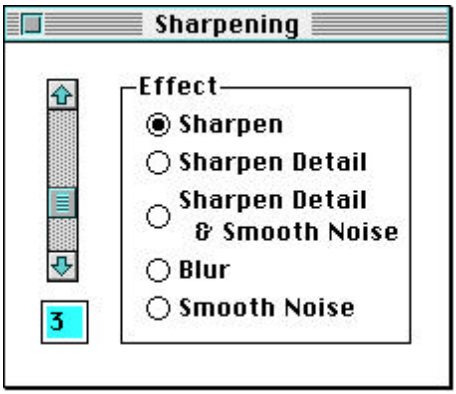
Link Colors: The Link Colors checkbox allows you to increase or decrease saturation of all colors when it's selected. Moving any one control moves the others as well, keeping the relative settings the same. In this way you can change saturation without changing color balance from that of the original.

Adjusting sharpness

You can increase the sharpness of an image beyond the focus of the original, or you can reduce the sharpness for a softer effect. You can also choose to smooth "noise," or the detail of background areas, for a smoother overall appearance.

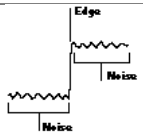
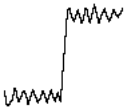
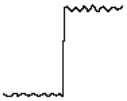
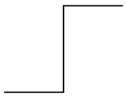
To adjust sharpness:

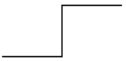
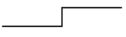
1 **Choose Sharpen from the Image menu.**



2 **Select the effect you want from the buttons in the Effect box.**

The choices are described in the table that follows. The drawings on the next page show schematically what changes take place at the edges of different areas.

Sharpening options	Effect	
Unaltered image	Edges and flat areas as input	
Sharpen	Sharpens the entire image; heightens all differences	
Sharpen Detail	Sharpens edges; does not change differences in flat areas	
Sharpen Detail & Smooth Noise	Sharpens edges and smooths flat areas	

Blurring options	Effect	
Smooth Noise	Smooths (lessens differences in) flat areas, leaves edges unchanged	
Blur	Softens the entire image; both edges and flat areas smoothed	

Sharpen Detail and Sharpen Detail & Smooth Noise are the options likely to produce satisfactory results in most cases.

3 **Use the sliding control on the left side to increase or decrease the amount of change of the effect you have chosen.** The higher the number, the greater the effect. The slider range is from 0 to 10.

Saving and reusing your settings

You may want to save the settings you have created for a particular image so that you can use them again with the same original or others like it. Parameters that are saved in a settings file include tonescale, saturation, sharpening, area of interest, and resolution.

To save settings:

1 **Choose Save As from the File menu.**

2 **In the dialog box, give your settings file a name.**

3 **Click OK.**

To open an existing settings file:

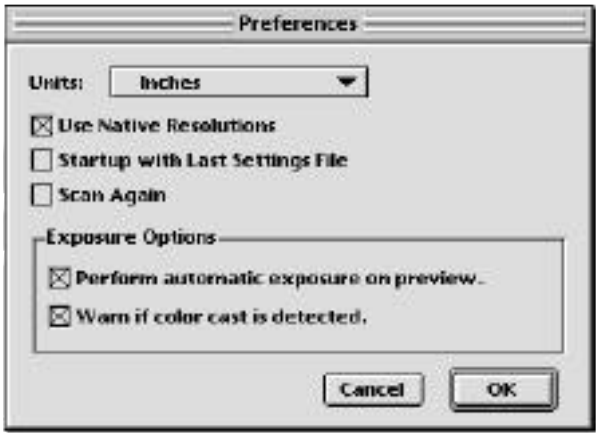
1 **Choose Open from the File menu.**

2 **Locate the file using the directory dialog box.**

3 **Click Open.**

The SprintScan 35 Plug-in Preferences dialog box allows you to set certain preferences that will be in effect until you change them.

- Choose Preferences from the Edit menu.



Units (default: Inches)
You have a choice of inches, millimeters, pixels, points and picas as your units of measure in the dimensions areas of the main screen. When Use Native Resolutions is checked, Pixels is dimmed and cannot be selected.

1 **Open the Units pop-up menu and choose the units you want.**

2 **Click OK.**

Use Native Resolutions (default: selected)
Native resolutions are those resolutions that give the best output results. When the Use Native Resolutions checkbox is unselected, you get the exact resolution that is needed, taking into account the output sizing values (see *Setting output size and scaling* in Chapter 2). When Use Native Resolutions is selected, you get the nearest native resolution greater than what is needed.

1 **Click the checkbox to select or deselect native resolutions only.**

2 **Click OK.**

Startup with Last Settings File (default: unselected)
When this option is selected, the plug-in remembers the last settings file used and loads the file the next time the plug-in starts up. When deselected, the default settings are used at start-up.

Scan Again (default: unselected)
When you turn on the Scan Again preference, the SprintScan 35 plug-in re-opens after you complete each scan. This allows you to scan a number of images without having to open the SprintScan 35 plug-in each time.

Exposure Options

Perform automatic exposure on preview (default: selected)
Check this option to turn on Auto Expose as a default setting. The software will automatically correct exposure during the preview scan for every scan, until you turn this option off. When you check this option, the letter A appears in the Auto Expose shutter icon in the Preview window to indicate it has been turned on in the Preferences dialog box.

When this option is turned off, you can turn on Auto Expose for individual images by using the icon or the menu item; see pages 2-7 and 3-7.

Warn if color cast is detected (default: selected)
If the software detects a color cast when setting a white point or black point, it displays a dialog box asking if you want to remove or retain the color cast.

4 Troubleshooting

If you cannot resolve a problem using this chapter and the hardware manual, contact Polaroid Technical Support. Before you call, have ready the following information:

- The model of your computer, including the kind of processor and the amount of RAM you have
- The model and serial number of your SprintScan 35 scanner (located on the bottom or rear panel of the scanner)
- A list of other devices attached to your system, such as CD-ROM drives, printers, external hard disks, and other SCSI devices
- A list of any other cards and drivers that you are using, along with any system extensions (see the Extensions folder inside the System Folder)
- Other applications you are using
- A description of the problem and the wording of any error messages that you see on your screen when the problem occurs

Call us	You may call Polaroid toll-free from within the U.S.A. at 1-800-432-5355, or fax the information about your problem to 1-617-386-9688, Monday through Friday, 8 A.M. to 8 P.M. Eastern Time. We offer a variety of Customer Support Services; call us for details and applicable fees. You may also write to Electronic Imaging Technical Support, Polaroid Corporation, 565 Technology Square 3B, Cambridge, MA 02139. In Canada, call toll-free at 1-800-268-6970. Outside North America, contact the Polaroid office nearest you (see pages 4-9–4-10).
Internet support	Technical Support is also available over the Internet. Connect to our web site at: http://www.polaroid.com

Tips on correcting images

This section describes how to make corrections to originals having common photographic faults. Note that many situations can be improved simply by clicking the Auto Exposure button. Understanding the various controls, however, can give you finer control over the results.

The original is underexposed (too dark) or overexposed (too light).

A well exposed image has good detail in the highlights (the lightest areas of the image) and in the shadow areas (the darkest parts of the image). An underexposed image is dark overall; it lacks detail in the shadow areas, the midtones are too dark, and the highlights are not light enough. An overexposed image is too light overall; it lacks detail in the highlight areas, the midtones are too light, and the shadow areas are not dark enough. To correct for exposure:

1. Choose Reset All on the Edit menu.
2. Choose Exposure on the Image menu to display the Exposure dialog box.
3. If the image is underexposed, increase exposure by moving the master slider to the right. If overexposed, decrease exposure by moving the master slider to the left. Adjust the image so that the highlights are bright, but still show detail.
4. If the shadow regions are now too light, use the Auto-Contrast feature from the Image menu. If they are still too light, use the black point eyedropper.
5. Choose Contrast/Brightness on the Image menu to display the Contrast/Brightness dialog box.
6. Using the Gamma (midtone) button for the RGB channel, increase or decrease the gamma control to correct the midtones and shadows.

The original has too much contrast.
An image that has too much contrast has highlights that are too light and lack detail, and shadow areas that are too dark and lack detail. To correct for this:

1 Begin with the image controls (Contrast/Brightness, Tonescale, Saturation and Exposure) set to the default settings. Click the Reset button on the individual dialog boxes if necessary.

2 Choose Exposure on the Image menu to display the Exposure dialog box.

3 Increase or decrease the master exposure slider until the image highlights are bright, but still show detail.

4 Choose Contrast/Brightness on the Image menu to display the Contrast/Brightness dialog box.

5 Using the Gamma (midtone) button for the RGB channel, increase or decrease the gamma control until the dark areas are dark, but still show detail.

Tip: The usual procedure for reducing contrast is to lower the exposure to correct the highlights, and then increase the midtone/gamma to correct the shadows.

The original lacks contrast.
An image that lacks contrast has a flat or overall gray appearance; there are no true blacks or whites. To correct an image that lacks contrast:

1 Choose Auto-Contrast on the Image menu. The area of interest is analyzed, and the contrast is automatically adjusted. The Auto-Contrast feature is somewhat conservative, so you may need more correction.

2 To further brighten the highlights, use the white point eyedropper.

3 To further darken the shadows, use the black point eyedropper.

The original is correctly exposed, but has a color cast.

As an example, a scene photographed in the shade will often have a blue cast. To correct a color cast:

1 Choose Exposure on the Image menu to display the Exposure dialog box.

2 If the image is a negative, try each of the three Automatic Cast Removal buttons. Each uses a different method for automatically correcting a cast. One of them will likely correct the problem.

3 If the image is a positive image, try Auto Exposure first. Then, try the gray eyedropper on a part of the image that should be neutral. Lastly, try adjusting the red, green, and blue sliders manually to fix the color cast.

Note: You may have trouble determining which color is off. Common mistakes are confusing blue with cyan and magenta with red. Try moving the different color sliders and watch the preview. For example, if you think the image is too blue, adjust the blue slider. As you move toward blue, the cast should get worse, and moving toward yellow should remove it. If this doesn't seem to be working, try moving the red slider and you may find you've mistaken a cyan cast for blue.

4 Neutralize minor color casts in the shadows, highlights or midtones with the gray point eyedropper.

Common color casts:

- Pictures taken outdoors in the shade are blue. To correct, move the slider toward yellow.
- Pictures taken with outdoor film under tungsten lights are red-yellow. To correct, move the sliders toward cyan and blue.
- Pictures taken with outdoor film under fluorescent lights are green or yellow-green. To correct, move the sliders toward magenta and blue.

Tip: Some experience in judging color will go a long way in helping you to fix a problem. If you are having difficulty, try starting with an image that looks correct. Experiment with this image by moving the color sliders to create color casts and observe the effect on the image.

Equal values of R, G, and B in a neutral part of the image indicate successful color cast correction. These values can also help determine which way to adjust an image.

The colors of the image are too intense or are washed-out.

Color saturation is the intensity, or purity of a color. Saturated colors are bright and eye-catching. Unsaturated colors are gray, muted, or washed-out looking. Adjust your image as follows:

1. Choose Saturation on the Image menu to display the Saturation dialog box.
2. If the image is undersaturated, increase the color by moving the master slider to the right. If oversaturated, decrease the color intensity by moving the master slider to the left.

   Tip: Usually, you'll find values between 1.0 and 1.4 to be pleasing. Although many people prefer colors that are slightly more intense than reality, increasing the saturation too much will produce colors that look unnatural.

Note: For connection and scanner operation problems, see also the scanner hardware manual.

The power indicator light comes on, but the ready light does not.

The scanner's self-test may have detected a problem. Try issuing a scan command with the SprintScan 35 Plug-In Module; the software may report more about the problem.

There is a communication problem between the computer and the scanner. Attempt to access the scanner with the plug-in to check whether the software can "see" the scanner.

The light itself may be faulty. Contact your dealer or Polaroid Technical Assistance.

The SprintScan 35 plug-in can't "see" the scanner.

Check that the scanner is plugged in and turned on. If it is not, shut down the computer, turn on the scanner, and then start up the computer.

Check the SCSI connections. Are both ends of the cable securely fastened, including the diamond-shaped clips?

Shut down your computer and turn off the scanner. Wait a few minutes, then turn on the scanner. Next, turn on the computer. Open your application and the SprintScan 35 plug-in and try again to make a preview scan.

On startup, the scanner driver displays an icon when system extensions are loaded. The number in the icon is the SCSI ID number assigned to the scanner. If the icon is not shown or if the icon has a bar through it, it means that the system was unable to see the scanner in the SCSI chain. (1) Go over the installation instructions again. (2) If you have more than one SCSI device in the chain, try disconnecting the other devices and connecting only the scanner. If the scanner then works, the problem may be one of your other devices or an ID number conflict.

Does any other SCSI device in the chain, if you have any, use the same SCSI ID number? Each device must have a unique number.

Nothing happens when you click Preview.
It's normal for the scanner to pause before scanning for calibration. The mechanism may move up and down slightly. After the calibration cycle, the mechanism should begin to lower for the preview scan. The initial preview may take several seconds.

An "insufficient memory" message appears when you try to make a final scan.
Your application takes care of memory allocation when you make a final scan. An insufficient memory message may indicate that you do not have enough RAM, or storage on your hard disk, or both, to continue. See your application's user manual. Strategies include closing other applications and windows, freeing storage on your hard disk, and scanning an image at a smaller scale or lower resolution.

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Appendix A: Glossary

black point	A point in an image that you select to be set to pure black (value 0 or the lowest value in the range). Any areas that had been darker than the selected point are clipped to the same value. Compare white point.
CCD	Abbreviation for charge-coupled device; a light-sensitive electronic device that converts light into an electrical charge. The SprintScan 35 scanner uses a CCD to read an original image and transmit its data to the computer.
contrast	The relative difference between light and dark areas of an image. High contrast gives a stark appearance; low contrast gives a gray or flat appearance.
crop	To select a rectangular area of interest in an image using the framing bars (or gray border). You can change the size of the rectangle and can move it around the image area to center the part of the image you want as your final scan. Changing the framed area can affect settings in the Output box.
dot	The smallest unit in a bitmapped image. The abbreviation dpi stands for dots per inch, a measure of image resolution.

emulsion	The light-sensitive coating on photographic film or paper. The emulsion side should face the read of the scanner for scanning (emulsion side toward the lens).
gamma	An exponential factor in the tonescale equation that is a means of easily adjusting midtone brightness of an image. The purpose of this factor is to replicate the eye's natural tone discrimination.
halftone	A type of image that uses a pattern of dots of varying size to represent shades of gray or color. The tighter the dot packing, i.e., the greater the dots per inch (dpi), the less perceptible are the individual dots and the higher the apparent resolution.
highlights	The lightest parts of an image. Setting a white point designates the most extreme highlight value.
hue	A more technical term for what we speak of as colors. Hues are different points along the continuous color spectrum.
midtones	The parts of an image between the lighter and darker areas; the middle portion of an image's tonescale curve. See also gamma.
negative	An image in which color values have been reversed, e.g., white is shown as black, and so on. The film type files included with the SprintScan 35 system allow conversion of 35mm negative images to positive images upon scanning.
pixel	Short for picture element; the smallest discrete element in a picture. Pixel is interchangeable with dot, although pixel most often refers to dots on the monitor screen rather than image dots.
positive	An image in which color values are roughly the same as in the subject itself. Slides are positive images; 35mm film negatives produce positives upon printing or computer manipulation.
resolution	The measure of detail in an image, usually given in dots per inch (dpi) or pixels per inch.

RGB	Abbreviation for red, green, blue; one of the standard color models. Computerized color images using this model are composed of combinations of red, green, and blue color values.
sampling	A process that converts an analog signal into digital values for computer use. Images can be saved by measuring the red, green, and blue (RGB) components of the image and assigning a range of values to each component. The higher the sampling rate, the better the reproduction of the image.
saturation	The degree of intensity of a color. Low saturation results in a gray or washed-out appearance, and high saturation in a bright, attention-getting appearance.
SCSI	Acronym for Small Computer System Interface; pronounced "scuzzy." An industry standard for connections and communication between the computer and peripheral devices.
shadows	The darkest parts of an image. The black point designates the most extreme shadow value.
sharpen	To improve or enhance the level of detail in an image. It is possible to create effects that exceed "perfect" focus.
smooth	To lessen the level of detail in an image by reducing the difference between edges of areas.
TIFF	Acronym for Tagged Image Format File; a file format used to store black-and-white, grayscale, and color images.
tone	The brightness, range, and balance of reds, greens, and blues in an image. Tone varies depending on color balance, contrast between highlights and shadows, and dimness or brightness of midtones (gamma variations).
tonescale	A graph showing input values versus output values for a scanned image. As you vary brightness, contrast, and gamma values, the changes are reflected in the tonescale graph.
white point	A point in an image that you select to be set to pure white (value 255 or the highest value in the range). Any areas that had been lighter than the selected point are clipped to the same value. Compare black point.

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Polaroid SprintScan License Agreement

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