EPSON® GT-30000

Color Image Scanner

Reference Guide

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Introduction

Features

The CD-ROM that comes with your scanner contains the EPSON scanner software suite, including EPSON TWAIN HS and EPSON TWAIN HS Network (The network version of EPSON TWAIN HS). The software suite is the perfect companion for your EPSON scanner. Using your scanner and the software from the CD-ROM, you can scan images in color, grayscale, or black and white, and save them as files or print them out. EPSON Scan Server allows your scanner to be used over a network.

❏ The software supports the following EPSON scanner:
   EPSON GT-30000

❏ EPSON TWAIN HS and EPSON TWAIN HS Network directly control all of the features of your EPSON scanner. This program is the standard cross-platform interface for other applications.

The CD-ROM also contains other applications that let you use your scanner in exciting new ways. For detailed information, refer to the supporting documentation.

❏ EPSON Screen Calibration utility allows you to calibrate your scanner and monitor to reproduce images identical to the originals.

❏ ISIS (Image and Scanner Interface Specification) driver is an industry standard interface for high performance document scanning.

About This Guide

The information in this guide is divided into six chapters, with a glossary and index provided for your reference.

❏ Chapter 1 describes the basic steps of scanning.

❏ Chapter 2 provides a complete description of EPSON TWAIN HS and EPSON TWAIN HS Network features. Refer to this chapter when modifying scanning settings.

❏ Chapter 3 covers how to calibrate your monitor to match your EPSON scanner. If you notice that colors on your screen or in your printout do not match the original image, see this chapter.

❏ Chapter 4 contains maintenance and troubleshooting information.It also contains customer support information. If your application does not operate properly or scanned images are not what you expect, see this chapter.

❏ Appendix A describes the procedure for initially setting up a PC to be a scanner server PC.

❏ Appendix B contains technical specifications information.

Notes contain important information and useful tips about your scanner and software.

To set up and use the scanner, see your scanner's online *Setup Guide*. EPSON TWAIN HS and EPSON TWAIN HS Network online help can also provide you with information on modifying EPSON TWAIN HS or EPSON TWAIN HS Network settings.

Chapter 1

Scanning Basics

Main Window and Preview Window

EPSON TWAIN HS and EPSON TWAIN HS Network have two main windows. The EPSON TWAIN HS window or the EPSON TWAIN HS Network window (main window) and the Preview window.

Note:
All settings and functions available from the two main windows are the same for both EPSON TWAIN HS and EPSON TWAIN HS Network. Although most of the illustrations and explanations in this guide are for the EPSON TWAIN HS, they also apply to EPSON TWAIN HS Network.

Main window

The main window gives you access to the controls where you can make basic settings, such as Document Source, the type of material to scan, scanning resolution, scanned image size, and so on. If you want to specify the areas of the images to scan or you want to see the effects of your settings before scanning, click **Preview** to open the Preview window to display the preview images.

Preview window
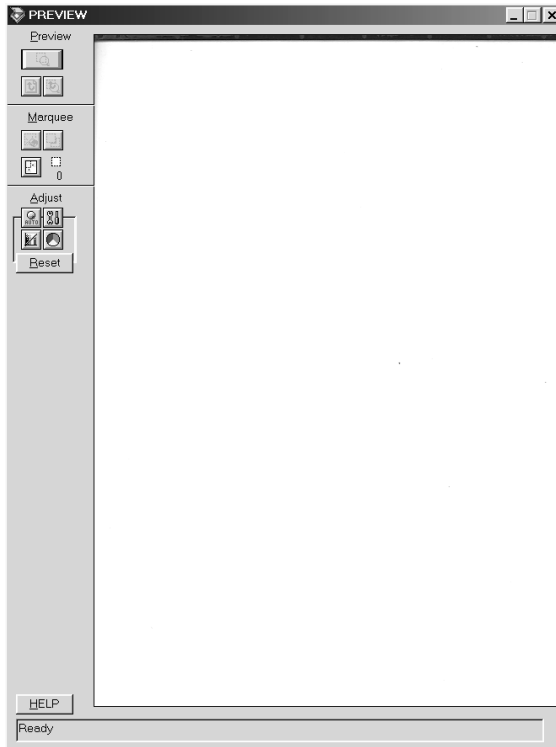
In the Preview window, there are more options available to give you greater control over your scanning image. Powerful tools are available to help you adjust tones, colors, and other elements to optimize your images.

Optimizing Image Scanning

EPSON TWAIN HS can automatically adjust and optimize the exposures and colors of scanned images during scanning. You can also make adjustments manually with the image quality adjustment tools in the Preview window. This section provides general information on optimizing images with these tools.
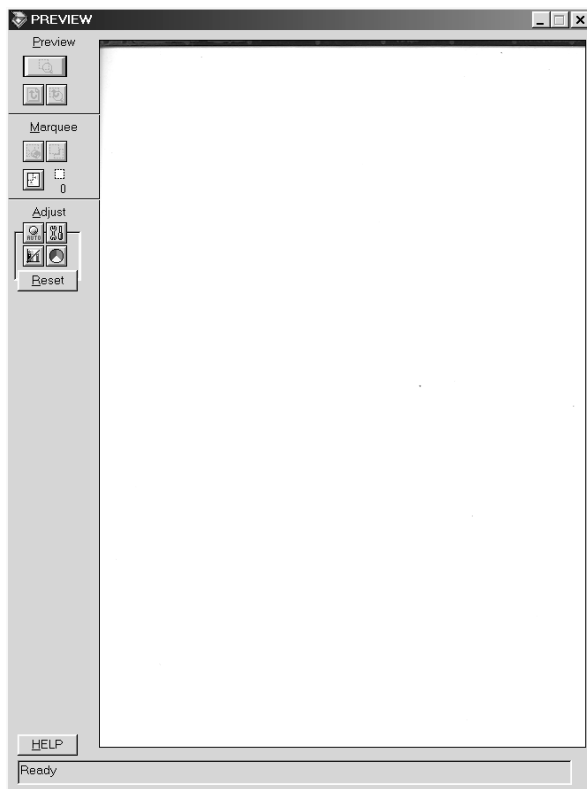
Preview window

Manually optimizing images

To optimize images manually, adjust the following EPSON TWAIN HS settings in the order specified below:

Adjust the brightness and contrast

1. Adjust the Highlight and Shadow settings in the Image Controls dialog box. See "Adjusting the Highlight Setting" on page 1-7 and "Adjusting the Shadow Setting" on page 1-8.

2. Adjust the Gamma setting in the Image Controls dialog box. See "Adjusting the Gamma Setting" on page 1-9.

3. Adjust the tone curve with a predefined tone correction setting in the Tone Correction dialog box. See "Applying a Preset Tone Curve" on page 1-10.

Make color adjustments

4. Adjust the Gray Balance Intensity setting in the Color Adjustment dialog box. See "Adjusting the Gray Balance Intensity Setting" on page 1-14.

5. Adjust the Saturation setting in the Color Adjustment dialog box. See "Adjusting the Saturation Setting" on page 1-15.

6. Manually adjust the tone curve for individual colors in the Tone Correction dialog box. See "Using the Tone Curve" on page 1-16.

To make the following adjustments in EPSON TWAIN HS, you need to display a preview image in the Preview window. See the following section for details.

Displaying a preview image

The Preview window shows you how your adjustments will affect the image as you make them. The Preview window is also the starting point for accessing the Image Controls, Color Adjustment, and Tone Correction dialog boxes that contain tools for optimizing your image.

Note:
See "Preview Window" on page 2-8 for Preview window options, and "Configuration Button" on page 2-24 for information about how to control preview image quality.

1. After selecting the **Document Source**, **Image Type**, and **Resolution** in the main window, click **Preview** to start prescanning. If the Preview window is not open, it opens and begins prescanning. A preview image of the document appears on your screen.

2. Click one of the buttons below to open the dialog box with the image optimization tools you need.

     Image Controls button

     Tone Correction button

     Color Adjustment button

Adjusting the Highlight Setting

Highlights are the brightest areas of an image.

1. In the Image Controls dialog box, click the eyedropper button under **Highlight**.
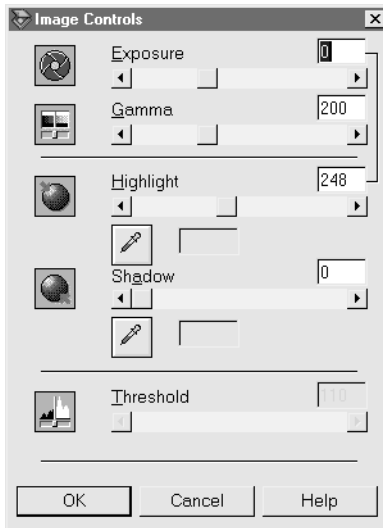
The pointer changes to an eyedropper, with movement restricted to within the Preview window.

2. Move the eyedropper to the location you want to select as the highlight point and click it.

   The brightness of the pixel at the point you click is set as the highlight level, and the other parts of the image are adjusted accordingly.

3. To change the highlight level (brightness) of the point you selected, move the **Highlight** slider left or right, or enter a value in the text box. You can enter a value between 61 and 490 for the highlight.

Note:
See "Image Controls" on page 2-18 for further information on adjusting the highlight level.

Adjusting the Shadow Setting

Shadows, the darkest areas of an image, are the opposite of highlights.

1. In the Image Controls dialog box, click the eyedropper button under **Shadow**.
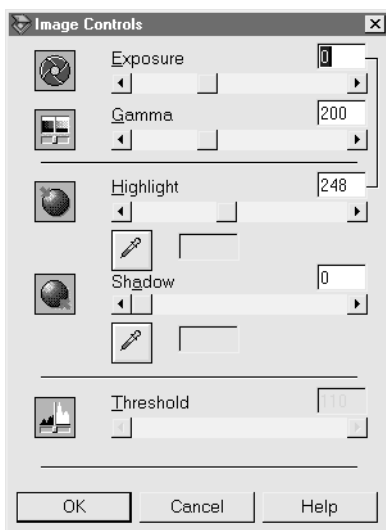
The pointer changes to an eyedropper, with movement restricted to within the Preview window.

2. Move the eyedropper to the location you want to select as the shadow point and click it.

The brightness of the pixel at the point you click is set as the shadow level, and the other parts of the image are adjusted accordingly.

3. To change the shadow level (darkness) of the point you selected, move the **Shadow** slider left or right, or enter a value in the text box. You can enter a value between 0 and 60 for the shadow.

Note:
See "Image Controls" on page 2-18 for further information on adjusting the shadow level.

Adjusting the Gamma Setting

Gamma is the difference in contrast between the light tones and dark tones of an image. Any change you make in the gamma level only affects the mid-tones of the image.
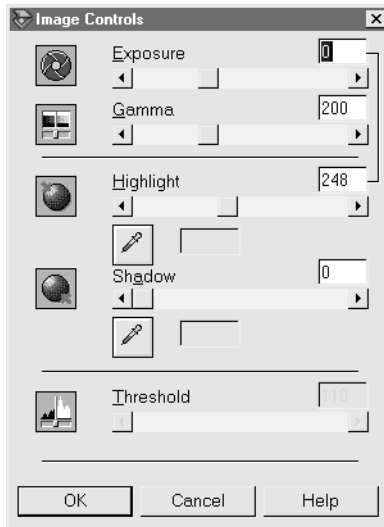
To change the gamma level of the image, move the **Gamma** slider left or right, or enter a value in the text box.

You can enter a value between 50 and 500 for the gamma.

Note:
See "Image Controls" on page 2-18 for further information on adjusting the gamma level.

Applying a Preset Tone Curve

You can finely adjust the contrast within an image by applying one of the preset tone curves. This allows more control over the image when used in conjunction with the Auto Exposure settings in the Preview window. The Tone Curve Name list in the Tone Correction dialog box provides the six most common tone correction curves, described below.

Linear
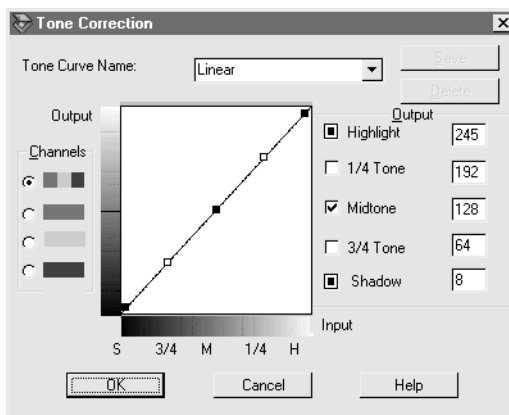
A linear tone curve has no tone correction. Use this setting if you are satisfied with the tone of the preview image.

Lighten
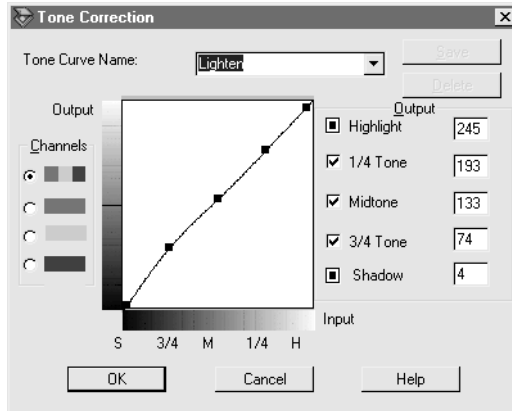
Adjusts darker images (like underexposed film) to make them slightly brighter.

Darken
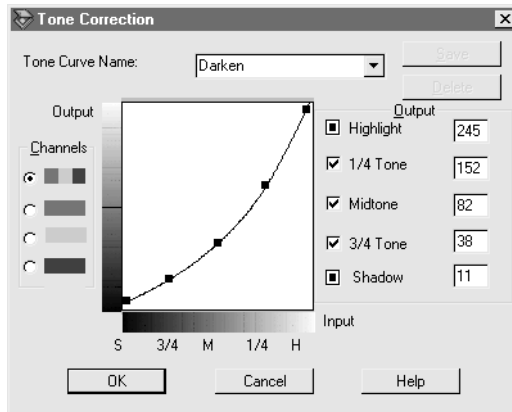
Adjusts brighter images (like overexposed film) to make them slightly darker.

Flat Contrast
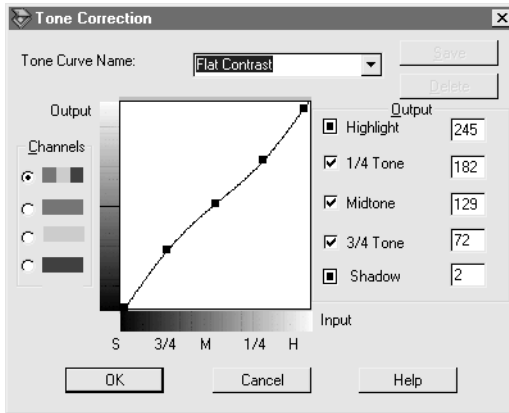
Flattens high contrast images to make them look more natural.

High Contrast
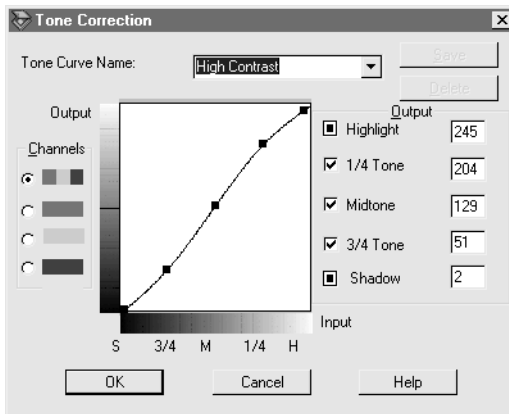
Increases the contrast of dull images.

Open Shadow
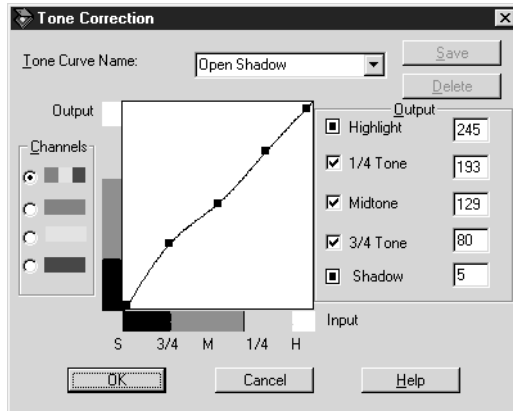
Improves details in the dark areas of images.

Note:
See "Using the Tone Curve" on page 1-16 and "Tone Correction" on page 2-20 for more information on tone correction.

Adjusting the Gray Balance Intensity Setting

Gray balance makes it possible to remove a cast (tint) from a specific color.

1. In the Color Adjustment dialog box, click the eyedropper button under **Gray Balance Intensity**.
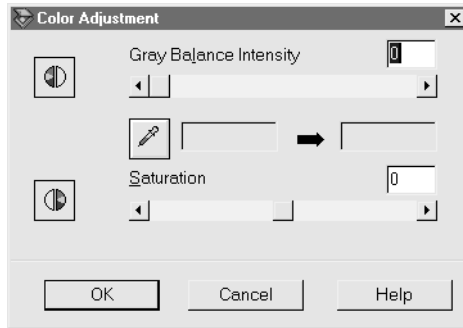
The pointer changes to an eyedropper, with movement restricted to within the Preview window.

2. Move the eyedropper to the location where you want to adjust its gray balance intensity, and then click the color.

The color you selected appears in the two boxes below the **Gray Balance Intensity** slider.

3. To change the gray balance intensity level of the color, move the slider left or right, or enter a value in the text box.

You can enter a value between 0 and 100. Changing the value causes the color in the right hand box to change accordingly. The changes are also reflected in the image in the Preview window.

Note:
See "Color Adjustment" on page 2-22 for more information on adjusting the gray balance intensity level.

Adjusting the Saturation Setting

Saturation is the density of a color. Higher saturation makes the color appear richer, while lower saturation makes it appear paler.
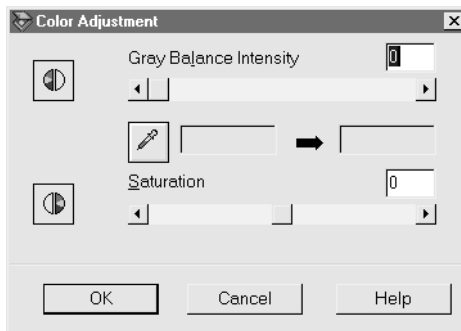
To change the saturation level of the image, move the **Saturation** slider left or right, or input a value in the text box.

You can enter a value between -100 (lowest color density) and 100 (highest color density).

Note:
See "Color Adjustment" on page 2-22 for more information on adjusting the saturation level.

Using the Tone Curve

The tone curve provides you with a versatile means for adjusting the intensity of colors of the image being scanned. You can adjust the shadow, mid-tone, and highlight values, which helps to ensure well-balanced coloring of the image.

Note:
❏ *Use of the tone curve is recommended for fine adjustments after you have previewed the image and adjusted the highlights and the shadows using the Auto Exposure and the Image Controls dialog box. Use of the tone curve to make initial settings is not recommended.*

❏ *The Tone Correction button becomes unavailable if* **Black & White** *is selected from the Image Type dialog box list.*

The tone curve is located in the Tone Correction dialog box, which appears when you click the **Tone Correction** button in the Preview window. The following section describes how to use each of the controls in the Tone Correction dialog box.

 Tone Correction button
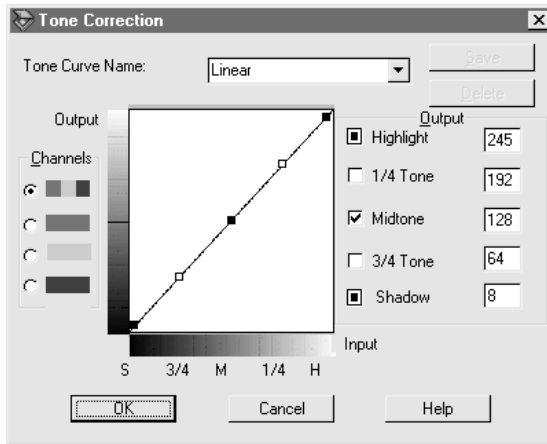
Tone Correction dialog box

Tone Curve Name list

Use this list box to select a preset tone curve. The following six
preset tone curves are available, and you can add your own curves
to the list using the procedure described in the next section,
"Saving your own tone curve" on page 1-19.

Curve Name	Highlight	1/4 Tone	Midtone	3/4 Tone	Shadow	Description
Linear	245	192	128	64	8	Default curve
Lighten	245	193	133	74	4	Lightens dark image
Darken	245	152	82	38	11	Darkens bright image
Flat Contrast	245	182	129	72	2	Reduces contrast
High Contrast	245	204	129	51	2	Increases contrast
Open Shadow	245	193	129	80	5	Lightens dark shadows

When you select a curve from the Tone Curve Name list, the settings in the Tone Correction dialog box change accordingly.

Channels

Click an option button under Channels to select the color whose tone curve you want to adjust. When the master channel at the top is selected, your adjustments affect all three colors. Selecting one of the other channels allows you to adjust red, green, or blue only.

Tone curve editor

Moving the pointer into the tone curve editor causes it to change to a finger. Use this pointer to drag any of the five points on the curve and change its shape. The x-axis of the curve is the brightness of the original (input values) while the y-axis is the brightness of the scanned image (output values).

To change the tone curve back to its default, select **Linear** from the Tone Curve Name list.

Output values

These are the current values for output data according to the current locations of the points inside the tone curve editor. These values change when you drag points in the tone curve editor, or you can enter values here to change the shape of the tone curve. Each value can be adjusted within the range of 0 to 255.

Note:
❏ *Each output value name has a check box to the left of it. Highlight and Shadow are always selected, but you can select or clear 1/4 Tone, Midtone, and 3/4 Tone by clicking their check boxes.*

❏ *When a value's check box is clear, its point on the tone curve editor automatically shifts to smooth out the tone curve when one of the other points is moved.*

❏ *When a value's check box is selected, it means that its point is fixed and it will not shift when other points are moved.*

Saving your own tone curve

Use the following procedure to assign a name to a tone curve you have customized and want to save for later use.

1. Modify the tone curve settings as desired. The name shown in the Tone Curve Name list changes to **User Defined**.

2. After customizing the tone curve, enter a name for the new curve (up to 32 characters) in the list box.

3. Click **Save** to save your new tone curve settings.

Deleting a customized tone curve

Use the following procedure to delete a custom tone curve. You cannot, however, delete the six preset tone patterns.

1. Select a custom tone curve from the Tone Curve Name list.

2. Click **Delete**.

3. When a dialog box appears, click **Yes** to delete the curve.

Closing the Tone Correction dialog box

You can close the Tone Correction dialog box by clicking either **OK** or **Cancel**.

❏ Clicking **OK** applies the current Tone Correction dialog box settings and closes the dialog box. Clicking the close button has the same effect as clicking **OK**.

❏ Clicking **Cancel** closes the dialog box without applying the current dialog box settings.

Optimizing OCR Scanning

This section gives you suggestions and recommended settings in order to improve OCR (Optical Character Recognition) scanning results.

Scanning text

Make sure you select **Black & White** for Image Type in the main window.

If the recognition rate is not satisfactory with the default settings, use the following steps to change the settings.

Improving character recognition

1. In the main window, make sure **Black & White** is selected in the Image Type list box.

2. Click **Preview**. Then click the **Image Controls** button in the Preview window to display the Image Controls dialog box.

Image Controls button
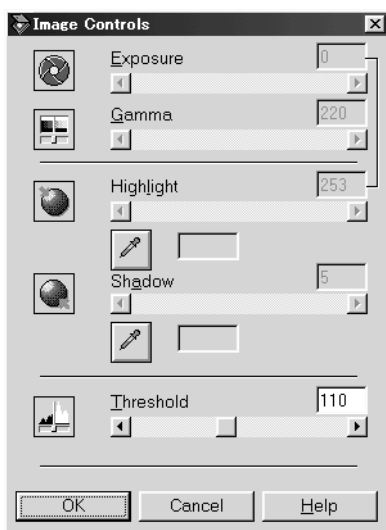
Image Controls dialog box

3. Use the **Threshold** slider to change the threshold value, monitoring the results of your changes in the Preview window. Adjusting the threshold value can make it easier for OCR to recognize characters.

If you still have problems...

1. In the main window, increase the Resolution value to 400. Remember that scanning at a higher resolution takes more time and may not greatly increase the recognition rate.

2. If you still have problems, try using the enhancement tools in your OCR software to make adjustments.

Potential text recognition problems

The quality of the text in your original document greatly affects OCR results.

The following types of originals can make recognition difficult and should be avoided if possible:

❏ Items that have been copied from other copies

❏ Faxes

❏ Text with tightly-spaced characters or line pitch

❏ Text that is in tables or underlined

❏ Cursive or italic fonts, and font sizes less than 8 points

Remember that OCR software cannot recognize handwritten characters.

Chapter 2

Understanding EPSON TWAIN HS Features

Overview

When you start EPSON TWAIN HS or EPSON TWAIN HS Network through a TWAIN-compliant application, the following window appears on the screen:

Note for EPSON TWAIN HS Network users:
Although most illustrations and explanations of settings and functions in this guide are for EPSON TWAIN HS, they also apply to EPSON TWAIN HS Network.

The following sections describe the features of EPSON TWAIN HS and EPSON TWAIN HS Network.

Note:
Some settings may appear dimmed depending on your choice of settings and the features supported by your scanner.

EPSON TWAIN HS Main Window

Main window

The main window is the starting point to make detailed settings. You can select parameters for a setting or select special functions provided with EPSON TWAIN HS to attain the highest quality scanned images.

Note:
- ❏ *Online help also provides you with information on settings. Click* **Help** *to access the online help.*

- ❏ *You cannot scan an image which exceeds the available memory or disk space. If you try to scan a very large image, an alert appears on the screen.*

- ❏ *Before scanning, be sure to calibrate your screen. For details, see "Calibrating Your Screen" on page 3-1.*

- ❏ *After an image is scanned, be sure to save or export it.*

Document Sources

When scanning a reflective document placed on the document table of the scanner, leave the Document Source set to **Flatbed**. Other selections depend on what is installed.

Flatbed:

Choose this setting to use the document table of the scanner.

ADF-Single-sided:

Select this setting to scan single-sided documents on the Automatic Document Feeder.

ADF-Double-sided:

Select this setting to scan double-sided documents on the Automatic Document Feeder.

Image Types

The Image Type list provides the following predefined settings.
They can be combined with the optional pixel depth, scanning
mode, de-screening, and auto exposure settings.

Image Type	24-bit Color ▼
	24-bit Color
Resolution	24-bit Color De-screening
	8-bit Gray
☑ Unsharp Mask	8-bit Gray De-screening
	Black & White
	Black & White Halftone
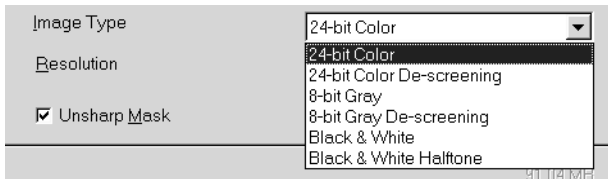
Note:
*The Auto Exposure feature is disabled when scanning without
previewing.*

24-bit Color:

An Image Type setting which produces 24-bit images with over
16 millions of colors. This setting reproduces highlight and
shadow details. Use this setting to scan color photos, and display
or print the images in full color.

24-bit Color De-screening:

An Image Type setting which produces 24-bit images with over
16 millions of colors. You can get relatively high contrast images
with the moiré pattern removed. Use this setting to scan printed
materials and display the images in full color.

Note:

❏ *A moiré is a cross-hatch pattern that appears on scanned images when scanning printed material. It is a result of interference that occurs due to the difference between the pitches of the scanning and the halftone screens.*

❏ *If de-screening is selected and Resolution is set to more than 800 dpi, when you click* **Scan***, an alert appears on the screen. Decrease resolution or scale.*

8-bit Gray:

An Image Type setting which produces 8-bit grayscale images with 256 levels of gray. This setting reproduces highlight and shadow details. Use this setting to scan photos and display or print the images in grayscale.

8-bit Gray De-screening:

An Image Type setting which produces 8-bit grayscale images with 256 levels of gray. You can get images with the light part lighter and the dark part darker, with the moiré pattern removed. Use this setting to scan printed materials and display or print the images in grayscale.

Black & White:

An Image Type setting which produces black and white images without halftoning. Use this setting to scan drawings or line art illustrations.

Black & White Halftone:

An Image Type setting which produces black and white images with 4×4 dither halftoning patterns. Use this setting to scan drawings or line art.

Changing Resolution

You can change the resolution for the current scanning operation by selecting or typing a new value. The value has a range of 50 to 4800 dpi in increments of 1 dpi.
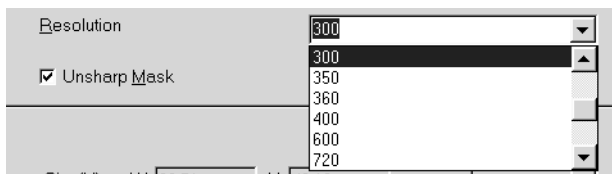
Unsharp Mask

You can select or deselect the Unsharp Mask setting. Selecting the check box improves image sharpness.

Note:
If the Document Source setting is **Black & White** *or* **Black & White Halftone***, this check box appears dimmed and is not available.*

Size

The Size fields indicate the size of the image that is displayed or selected in the Preview window.
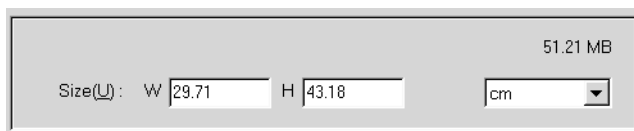
Note:
❏ *The image size setting is closely related to the resolution. If you change either setting arbitrarily, the resulting image may not be what you expect.*

❏ *The image size setting is not available before previewing the image.*

Width and Height menu:

The width and height of an image are indicated in the selected unit of measure. You can type new values directly in the indicator fields, or you can change the image area in the Preview window by creating a marquee or frame. Do this by dragging the mouse over the desired area. See "Marquee and Marquee Buttons" on page 2-11 for more information on marquees.

Units menu:

Select a unit of measurement. You can select either **pixels**, **inches**, or **cm**.
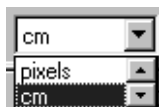
Storage size indicator:

The storage size of an image is indicated in KB or MB. As you change the image area in the Preview window, this value also changes.

Preview Window

Before you scan and save an image, you can preview it in the
Preview window. The Preview feature displays your image in the
Preview window and allows you to see the effects of your settings
before scanning. You can also use the Preview feature to
determine the width and height of the scanning image and the file
size of the image to be saved. See "Size" on page 2-6.

Note:
You cannot preview an image which exceeds the available memory or
disk space. If you try to scan a very large image, an alert appears on the
screen.

To preview an image, click **Preview** in the main window.

The following window appears.
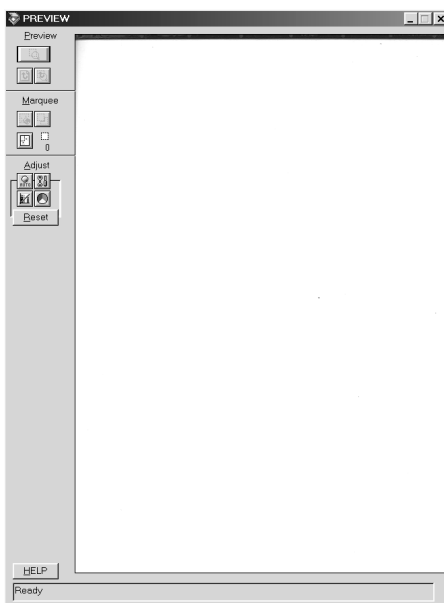
Preview window

You can see the effects of the following settings in the preview image.

❏ Image Type in the main window

❏ Unsharp Mask in the main window

❏ Exposure, Gamma, Highlight, Shadow, and Threshold in the Image Controls dialog box

❏ Tone Correction in the Tone Correction dialog box

❏ Gray Balance Intensity and Saturation in the Color Adjustment dialog box

❏ Auto Exposure

Note:
Although the image in the Preview window changes as you make settings, the settings do not affect the real image until you scan or rescan the image.

For more information on image settings, see "Image Controls" on page 2-18, "Tone Correction" on page 2-20, "Color Adjustment" on page 2-22, and "Configuration Button" on page 2-24.

Preview Buttons

Zoom Preview button

To preview a part of the image that is already in the Preview window, drag the mouse to create a marquee over the area you want to see in detail, then click the **Zoom Preview** button. See "Marquee and Marquee Buttons" on page 2-11 for information about marquees.

Note:
If the Document Source setting is **ADF-Single-sided** *or* **ADF-Double-sided***, the Zoom Preview button appears dimmed and is not available.*

Return to Full Preview button

Clicking the **Return to Full Preview** button restores the image to a full preview. This button is available only when the marquee is zoomed as described above.

Return to Zoom Preview button

Clicking the **Return to Zoom Preview** button restores the image to the previous zoom. This button is available only when a marquee has been previously zoomed. This restores the zoom preview from memory, which is quicker than rescanning the same zoomed area by clicking the **Zoom Preview** button again.

Marquee and Marquee Buttons

A marquee is a frame around an entire image, or just a part of a certain image. Marquees are often used in scanning and image-editing software to select only the most important part of an image.

There are buttons available on the Preview window to help you manage the marquees.

Making and modifying marquees

Move the pointer over the image in the Preview window, and the pointer becomes a cross-hairs. Drag (move the mouse while holding down the mouse button) the cross-hairs over any area of the image, and a dotted frame appears. The point where you first clicked is anchored, but the rest of the frame is sizable and movable. After you finish creating a marquee, you can resize and move it as described below.

Multiple marquees

You can make multiple marquees in one image to scan the most important parts while ignoring the rest. It is also useful to set several items on the document table and scan all of them in just one scan. Marquees can be different sizes, and they can overlap. Extra marquees can be made anywhere except on the frame of another marquee. You can make settings on each marquee.

You can begin a marquee anywhere the pointer appears as cross-hairs. To distinguish the active marquee from other marquees, look at the marquee frames. The active marquee is indicated by a moving dotted line as shown below. To make an inactive marquee active, just point the cursor at the edge of the marquee and click. The marquee becomes active.

Resizing marquees

When the pointer is placed on the edge of the marquee, it changes to a double-headed arrow. You can resize the marquee by dragging the arrow. The double-headed arrows appear only on the active marquee.
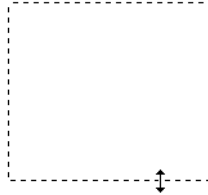
If you drag an arrow while pressing the **Shift** key, the marquee is resized proportionally.

Moving marquees

When the pointer is placed within the active marquee, it changes to a hand icon. You can drag the marquee anywhere in the Preview window to move it.

If you drag a hand icon while pressing the **Shift** key, the marquee is limited to vertical or horizontal movement.

Note:
If you want to create a marquee inside the active marquee, first make a marquee outside the active marquee. The newly created marquee becomes the active marquee and you can move it inside the other marquee.

Delete Marquee button

Clicking the **Delete Marquee** button removes the active marquee.

Note:
You can also delete the active marquee by pressing the **Delete** *key on your keyboard.*

Duplicate Marquee button

Clicking the **Duplicate Marquee** button creates another marquee with the same size as the active marquee. Use this button to make multiple marquees.

Clicking the **Duplicate Marquee** button while holding down the keys noted in the table below causes the active marquee to be duplicated in a specific direction next to the original marquee.

Horizontal	Vertical
Ctrl key	Alt key

Auto Locate button

Click the **Auto Locate** button to cause the scanner to automatically locate and select the target image. The image appears without white borders in the Preview window.
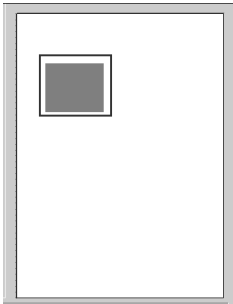
entire preview area   **located image**
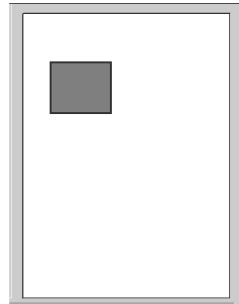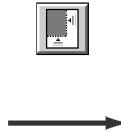
If a document contains more than one image, select a target image by dragging the pointer over the image and clicking the **Auto Locate** button. The selected image is located automatically.
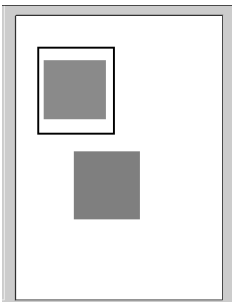
target image and other image   **located and non-located images**
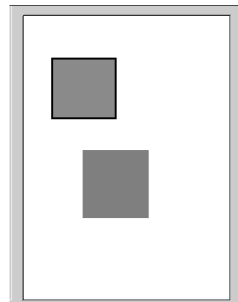
Marquee number indicator

This shows the number of marquees in the Preview window. To create more marquees, see "Duplicate Marquee button" on page 2-14.

Adjust Buttons

Before you scan an image, you can make adjustments manually with the powerful image quality adjustment tools on the Preview window. The following adjust buttons are available.

	auto exposure button
	image controls button
	tone correction button
	color adjustment button

Auto Exposure

Click the **Auto Exposure** button on the Preview window to
automatically optimize the exposure for an image. The Gamma,
Highlight, and Shadow settings in the Image Controls dialog box
are automatically set.

Note:
The Auto Exposure button appears dimmed and is not available when
the Image Type setting is **Black & White***.*

Image Controls

Click the **Image Controls** button on the Preview window to view the following dialog box.
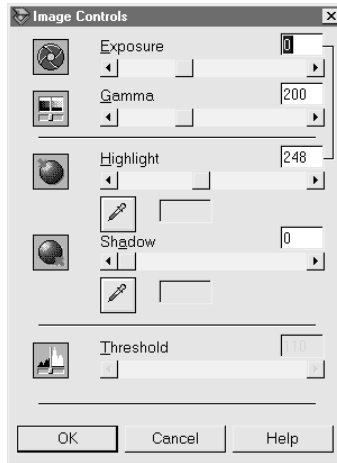
Note:
❏ *If the Image Type setting is* **Black & White***, all the settings except Threshold appear dimmed and cannot be selected.*

❏ *You can see the effects of the Image Controls settings in the Preview window.*

Exposure:

The Exposure setting lightens or darkens an image. You can select from -10 (darkest) to 20 (brightest) by moving the slider.

The Exposure and Highlight controls are related. When the Exposure setting is changed, the Highlight value is automatically set.

Gamma:

The Gamma control allows you to adjust the mid-tones in an image. You can select from 50 (darkest) to 500 (brightest) by moving the slider.

Highlight:

The Highlight control allows you to adjust the brightness level of the brightest parts of an image. You can select from 61 to 490 by moving the slider.

Click the eyedropper button beneath the slider, and the pointer changes to an eyedropper. Move the eyedropper over the preview image, and click a bright area. The eyedropper "picks up" the color from that area, and uses it as the highlight for the entire image. This effect appears immediately in the preview image. Click **Cancel** to restore the original image.

If you want to stop adjusting the setting using the eyedropper, press the **Esc** key on your keyboard.

Shadow:

The Shadow control allows you to adjust the darkness level of the darkest parts of an image. You can select from 0 to 60 by moving the slider.

Click the eyedropper button beneath the slider, and the pointer changes to an eyedropper. Move the eyedropper over the preview image, and click a dark area. The eyedropper "picks up" the color from that area, and uses it as the shadow for the entire image. This effect appears immediately in the preview image. Click **Cancel** to restore the original image.

If you want to stop adjusting the setting using the eyedropper, press the **Esc** key on your keyboard.

Threshold:

Available only when the Image Type setting is **Black & White**. The scanner scans gray shades as either black or white using this setting.

You can select from 0 (lightest) to 255 (darkest) by moving the slider.

Tone Correction

Click the **Tone Correction** button in the Preview window to view the following dialog box.
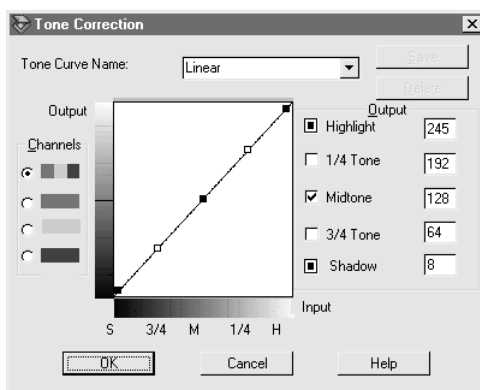
Note:

❏ *The default Tone Correction setting is* **Linear***.*

❏ *The Tone Correction button appears dimmed and is not available when the Image Type setting is* **Black & White***.*

❏ *You can see the effects of the Tone Correction settings in the Preview window.*

The tone value represents the contrast in the tonal relationship between an original image and its reproduction on a monitor or printer.

Tone Curve Name list:

Select a tone correction setting from this list. The custom settings you have saved appear in this list.

Tone Curve editor:

The editor allows you to customize tone correction. Drag points on the tone curve to adjust the tone value. You can edit up to five tonal elements.

Output options:

If you select the check box for a specific point, such as 1/4 Tone or Midtone, you can move that point and it remains where you leave it; it is not affected by the movement of other points on the curve. If the check box is cleared, the point becomes affected by the movement of other points.

Channels options:

You can select the combined red, green, and blue (RGB) channel to modify all colors, or select these colors separately.

Note:
If the Image Type setting is **8-bit Gray**, **8-bit Gray De-screening**, *or* **Black & White Halftone**, *you can select only the combined RGB channel option.*

Save/Delete/OK/Cancel/Help buttons:

After you correct tone, type a name for your custom settings in the Tone Curve Name list, and then click **Save**.

To delete a setting, select the name of the setting you want from the Tone Curve Name list, and then click **Delete**.

To accept the defining Tone Correction or close the dialog box, click **OK**.

To cancel the operation, click **Cancel**.

To access the online help, click **Help**.

Color Adjustment

Click the **Color Adjustment** button in the Preview window to view the following dialog box.
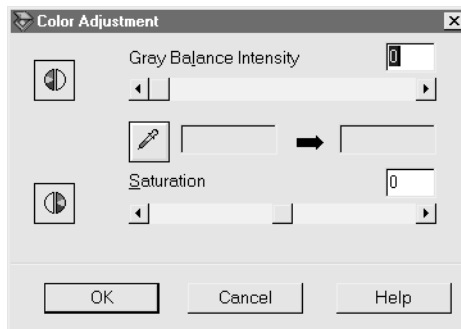
Note:
❏ *If the Image Type setting is* **8-bit Gray**, **8-bit Gray De-screening**, **Black & White**, *or* **Black & White Halftone**, *the Color Adjustment button appears dimmed and these settings cannot be selected.*

❏ *You can see the effects of the Color Adjustment settings in the Preview window.*

Gray Balance Intensity:

Gray Balance Intensity removes unwanted color casts and tints by balancing color saturation.

Click the eyedropper button beneath the slider. The pointer changes to an eyedropper. Then click the color you want to represent gray. The eyedropper "picks up" the color and displays it in the box beside the eyedropper button. You can then correct the cast level for that color from 0 to 100 by moving the slider. The corrected color appears in the box on the right, and the effect shows up immediately in the preview image. Click **Cancel** to restore the original image.

If you want to stop adjusting the setting using the eyedropper, press the **Esc** key on your keyboard.

Saturation:

Saturation is the property that defines color depth. Select a saturation level from -100 (less color) to 100 (more color) by moving the slider.

Reset button

Click the **Reset** button to return any image control settings you made back to their default settings. If you did not alter any image control settings, this button appears dimmed and is not available.

Configuration Button

You can adjust the Preview window by changing the configuration. Click the **Configuration** button to display the following dialog box and make changes.

```
┌─────────────────────────────────────────────────────┐
│ ◈ Configuration                                  [×] │
├─────────────────────────────────────────────────────┤
│                                                       │
│   ☑ Save Preview Image and Settings                   │
│                                                       │
│   ☑ Auto Exposure on Preview                          │
│                                                       │
│   ☐ ICM/sRGB                                          │
│                                                       │
│                                                       │
├─────────────────────────────────────────────────────┤
│    ┌──────────┐    ┌──────────┐    ┌──────────┐      │
│    │   OK     │    │  Cancel  │    │   Help   │      │
│    └──────────┘    └──────────┘    └──────────┘      │
└─────────────────────────────────────────────────────┘
```
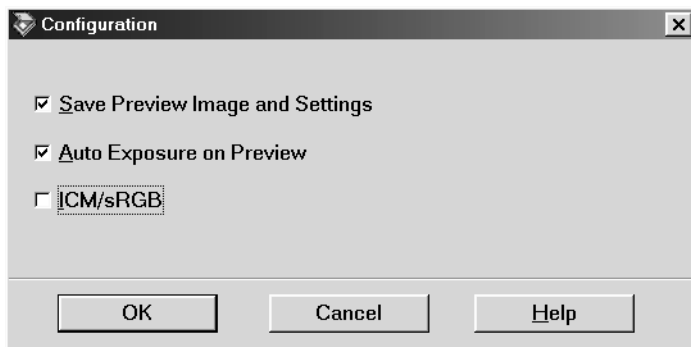
Save Preview Image and Settings:

Select this check box to automatically save the preview image and its image settings when you exit EPSON TWAIN HS (and quit scanning). The image and its settings are available the next time you restart EPSON TWAIN HS.

Auto Exposure on Preview:

Select this check box to display the previewed image with automatically optimized exposure settings. This produces the same result as if clicking the **Auto Exposure** button.

Note:
If **ICM** *or* **ICM/sRGB** *is selected in the Configuration dialog box, this check box is grayed out.*

ICM, ICM/sRGB (for Windows 95, 98, 2000, and Millennium Edition users):

Depending on your Windows version, this setting may not be available. Select **ICM** (for Windows 95) or **ICM/sRGB** (for Windows 98, 2000, and Millennium Edition) to reproduce the colors in your image using the Windows ICM color management system.

Note:
❏ *If your printer and monitor do not support ICM, be sure this check box is cleared.*

❏ *If the Image Type setting is not* **24-bit Color** *or* **24-bit Color De-screening***, this check box is available, but the function does not work.*

❏ *See "Using ICM, ICM/sRGB (For Windows 95, 98, 2000, and Millennium Edition Users)" on page 3-6 for more details.*

Scan Button

Clicking the **Scan** button scans the image or all of the marquees in the Preview window (one at a time). The scanned image is transferred to the application software you used to open EPSON TWAIN HS so that you can work with the image from within that application.

While scanning, a progress indicator appears. If necessary, click **Cancel** to cancel the operation.

Note:
❏ *You cannot scan an image which exceeds the available memory or disk space. If you try to scan a very large image, an alert appears on the screen.*

❏ *Before scanning, be sure to calibrate your display screen. For details, see "Calibrating Your Screen" on page 3-1.*

❏ *After an image is scanned, be sure to save it.*

❏ *The Auto Locate feature is automatically activated when scanning without previewing.*

Chapter 3

Calibrating Your System

Overview

When you install EPSON TWAIN HS, the EPSON Screen Calibration utility is automatically installed.

EPSON Screen Calibration calibrates your monitor to ensure the tone and contrast on your screen match the original image. Be sure to calibrate your screen before using your scanner.

Calibrating Your Screen

You need to calibrate your screen when you first install the scanner software, and anytime you switch to a different monitor.

For Windows 98, 2000, and Millennium Edition users

1. Double-click the **Scanners and Cameras** icon in Control Panel. The Scanners and Cameras Properties dialog box similar to the one shown below appears.

2. Select a scanner you want to use, and then click **Properties**.
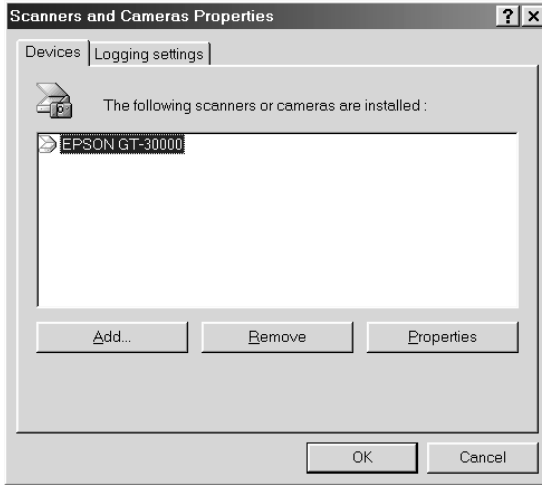
3. Click the **Utility** tab, then click the **Screen Calibration Utility** icon. The Screen Calibration dialog box appears.
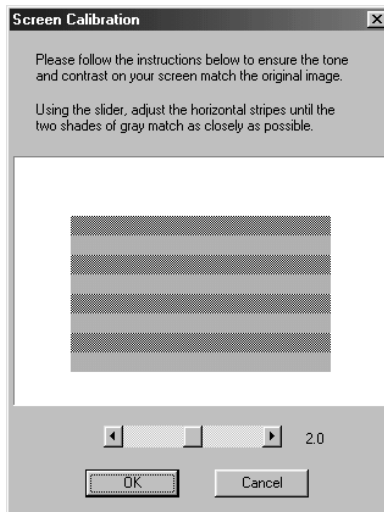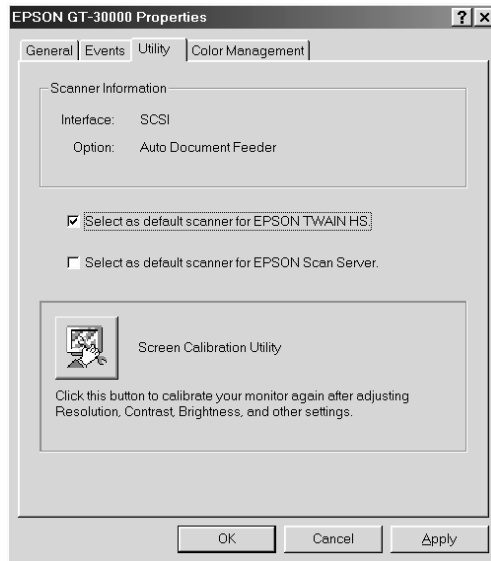
4. Look at the screen and move the slider to the right or left until the two shades of the gray horizontal stripes match.

   Note:
   View the screen from a short distance. While the gray stripes do not blend perfectly well, try to adjust until the different tones match as closely as possible.

5. Click **OK** to finish calibrating your scanner and monitor.

For Windows 95 and NT 4.0 users

1. Double-click the **EPSON TWAIN HS** icon in Control Panel.

   The EPSON TWAIN HS setup dialog box appears.
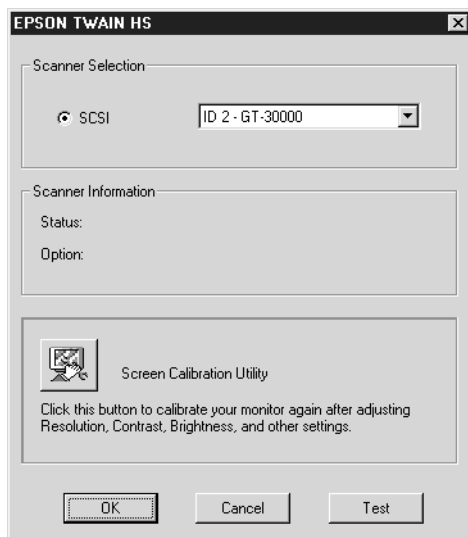
2. Click the **Screen Calibration Utility** icon in the dialog box.

The following screen appears:
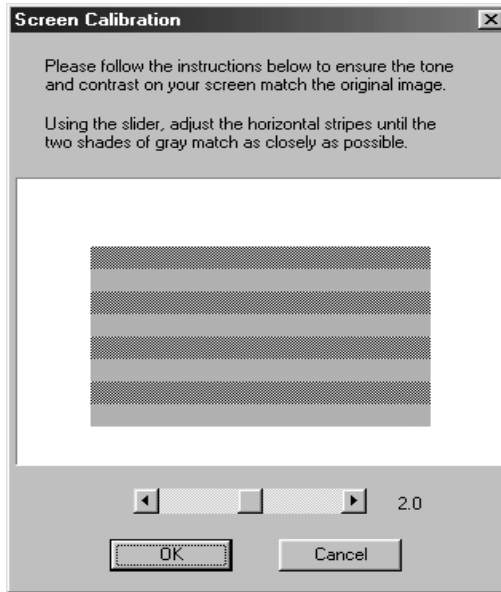
3. Look at the screen and move the slider to the right or left until the two shades of the gray horizontal stripes match.

   Note:
   View the screen from a short distance. While the gray stripes do not blend perfectly well, try to adjust until the different tones match as closely as possible.

4. Click **OK** to finish calibrating your scanner and monitor.

Using ICM, ICM/sRGB (For Windows 95, 98, 2000, and Millennium Edition Users)

If you use Windows 95, 98, 2000, or Millennium Edition and your output devices (printer and monitor) support the ICM color management system, you can use the ICM calibration method. Follow the steps below:

Note:
❏ *If your output devices do not support ICM, clear the check box.*

❏ *If the Image Type setting is not* **24-bit Color** *or* **24-bit Color De-screening**, *this check box is available, but the function does not work.*

1. Run a TWAIN-compliant application and start EPSON TWAIN HS.

2. Click **Configuration**. Select **ICM** (for Windows 95) or **ICM/sRGB** (for Windows 98, 2000, and Millennium Edition) in the Configuration dialog box, and click **OK**.

3. Make any other settings you want.

4. Click **Scan**.

The scanner scans an image using the ICM profile.

Chapter 4

Maintenance and Troubleshooting

Maintenance

Cleaning the scanner

To keep your scanner operating at its best, you should clean it periodically, as described below.

1. Turn the scanner off and unplug the power cord.

2. Clean the outer case with a cloth dampened with mild detergent and water.

3. If the glass of the document table gets dirty, clean it with a soft dry cloth. If the glass is stained with grease or some other hard-to-remove material, use a small amount of glass cleaner and a soft cloth to remove it. Wipe off all remaining liquid.

Be sure that there is no dust on the glass of the document table. Dust can cause spots in your scanned image.

> **Caution:**
> ❏ *Be careful not to scratch or damage the glass of the document table, and do not use a hard or abrasive brush to clean it. A damaged glass surface can decrease the scanning quality.*
>
> ❏ *Never use alcohol, thinner, or corrosive solvent to clean the scanner. These chemicals can damage the scanner components as well as the case.*
>
> ❏ *Be careful not to spill liquid into the scanner mechanism or electronic components. This could permanently damage the mechanism and circuitry.*
>
> ❏ *Never open the scanner case.*

Replacing the fluorescent lamp

The luminosity of the fluorescent lamp declines over time. If the lamp breaks or becomes too dim to operate normally, the scanner stops working and both the **READY** and **ERROR** lights rapidly flash. When this happens, the lamp assembly must be replaced. For details, contact your dealer.

> **Caution:**
> *Never open the case of the scanner. If you think repairs or adjustments are necessary, consult your dealer.*

Transporting the Scanner

Before transporting the scanner over a long distance or storing it for an extended period, you need to uninstall the Automatic Document Feeder and lock the scanner's carriage to prevent damage. Follow the steps below.

1. Turn on the scanner and wait until the carriage moves left to the home position. Then turn off the scanner.

2. Uninstall the Automatic Document Feeder in the reverse order as explained in your online *Setup Guide*.

3. Secure the carriage by turning the transportation lock button clockwise while pushing it, using a coin or similar disc.

   Make sure the transportation lock button is depressed.
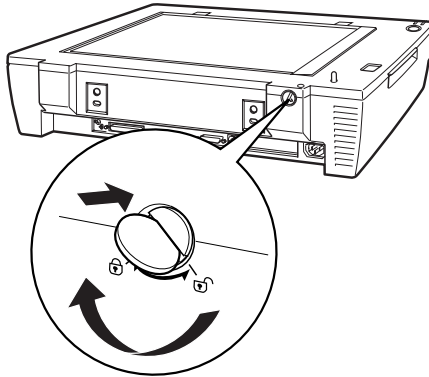
Problems and Solutions

Most of the problems you will encounter while operating your scanner and software have simple solutions. This section divides scanner problems into eight categories:

"Error Indicator" on page 4-5
"Operating Problems" on page 4-6
"Quality Problems" on page 4-8
"Software Setup Problems" on page 4-12
"Software Operation Problems" on page 4-14
"Scanning Problems" on page 4-15
"Paper Jams" on page 4-17
"Network Problems" on page 4-18

See the table in "Error Indicator" on page 4-5 first. If this does not help you solve your problem, go to the category for the type of problem you have, then look for the problem description.

Note:
If some settings appear dimmed in EPSON TWAIN HS and EPSON TWAIN HS Network, they cannot be selected because of the capability of your scanner or your choice of other settings.

If you cannot solve a problem after reading and following the information in this section, contact your dealer or a qualified customer support person for assistance.

Error Indicator

If an error occurs, the scanner stops and the **ERROR** and **READY** lights show the type of error.

ERROR Light	READY Light	Error Type
On	On	"Command error" on page 4-5
Flashing	Off	"Interface error" on page 4-5
Flashing	Flashing	"Fatal error" on page 4-5
Off	On	"Option error" on page 4-6

Command error

The scanner has received incorrect commands from your scanning software.

When this error occurs, try to rescan the document. The scanner returns to normal when it receives correct commands. Normally you do not need to reset the scanner when this type of error occurs.

Interface error

The interface setup is wrong or the scanner is not properly connected to the PC.

When this error occurs, check the interface connection and then turn the scanner off and then back on again to reset it.

Fatal error

This type of error indicates one of the following problems:

❏ The fluorescent lamp needs to be replaced.

❏ The transportation lock lever is not released.

❏ The scanner is malfunctioning.

Check that the transportation lock lever is released and check any installed options for problems. Next, turn the scanner off and then back on again. If this does not correct the problem, consult your dealer.

Option error

This indicates a problem with an installed unit, such as a paper jam, an empty document feeder, or an open cover.

Check the option and correct the cause of the problem.

Operating Problems

Problems you may have while using the scanner often involve the operation of your software and PC. Operation problems usually occur because of:

❏ Incorrect setup of the interface (see your online *Setup Guide*).

❏ Inappropriate selection of the scanner functions (see your software documentation).

❏ Incorrect setup of your PC or software (see your online*Setup Guide*).

❏ Incorrect operation of your software (see your software documentation).

Also see the documentation that came with your PC and software for possible solutions.

The OPERATE light does not come on.

❏ Press the **OPERATE** button to turn on the scanner.

❏ Make sure the power cord is connected to the scanner and plugged into a wall outlet.

The scanner does not scan.

❏ Wait until the **READY** light comes on (ready for scanning).

❏ Make sure the interface port and software settings are correct. Also make sure that your computer's interface board is installed properly.

❏ **For SCSI interface users:**
Make sure the scanner's SCSI ID and the terminator are set correctly. See your online *Setup Guide*.

If you have other expansion boards in your PC, make sure that their interrupt settings are not interfering with your SCSI board. See your PC's documentation for details.

The scanner software does not work properly.

❏ Make sure your software is installed correctly.

❏ **For Windows 98, 2000, and Millennium Edition users:**

Check if your scanner is listed more than once in the Scanners and Cameras Properties dialog box. To view the dialog box, double-click the **Scanners and Cameras** icon in Control Panel. Remove your scanner everywhere it appears in the dialog box, then reinstall EPSON TWAIN HS following the instructions in your online *Setup Guide*.

Note:
When reinstalling the scanner software, if you see a message box and then a dialog box requesting the EPSON Scanners Driver Disk, insert the scanner software CD-ROM in the CD-ROM drive. Be sure to specify the correct drive letter, the **EPSON** *folder, the folder of your preferred language, and the* **Win98**, **Win2000**, *or* **WINME** *folder as the location.*

❏ Make sure your PC meets the memory and other system requirements specified for the software you are using.

❏ Make sure the PC has enough memory for your software. If the PC does not have enough memory available, see your software and PC documentation for details.

Quality Problems

The entire image is distorted or blurred.

❏ Make sure the document is flat against the document table.

❏ Make sure you do not accidentally move the document during scanning.

❏ Make sure the scanner is on a flat, stable surface.

Part of the image is distorted or blurred.

Make sure the document is uniformly flat against the document table. A document that is wrinkled or warped may not scan well.

> *Caution:*
> *Do not place heavy objects on the document table.*

Edges of the document are not scanned.

Position the document so the area you want to scan is within the edge guide limits of the document table.

Note that an area 0.5 mm in from both horizontal and vertical rulers will not be scanned.
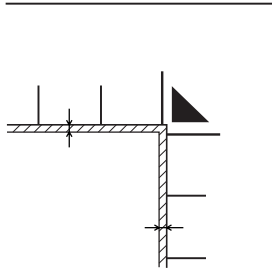
Colors are patchy or distorted at the edges of the image.

❏ A document that is very thick or warped at the edges can cause discoloration. Cover the edges of the document with paper to block outside light.

❏ Make sure the document is flat against the document table.

The image is faint or out of focus.

❏ Make sure the document is flat against the document table.

❏ Adjust your software's Exposure setting. See "Image Controls" on page 2-18.

❏ Adjust your software's Gamma setting. See "Adjusting the Gamma Setting" on page 1-9.

The image is too dark.

❏ Check your software's brightness setting. See "Adjusting the Highlight Setting" on page 1-7.

❏ Check the brightness and contrast settings of your computer display.

Straight lines in the image come out jagged.

Make sure the document orientation is perfectly straight on the document table. Align vertical and horizontal lines with the scales at the top and side of the document table.

The image does not look the same as the original.

❏ Try different image setting combinations on your scanner software.

❏ Your software may not have sufficient color matching and color management features, or these components may not be installed correctly. See the documentation that comes with your software and computer.

❏ If you are importing an image file, make sure the file format is one your software can read. Also, make sure the image settings of your software are appropriate for the type of image you want to scan.

A line of dots is always missing from the scanned image.

❏ Print head malfunction is indicated when a line is missing on printouts only. See your printer manual.

❏ Scanner sensor malfunction is indicated when a line is missing on both screen images and printouts. Contact your dealer.

Colors on your monitor are different from those in the original image.

❏ Check the image settings of your scanner software, especially data format (bits, pixel, color), gamma correction, and color correction. Try different combinations of these settings.

❏ Check the color matching and color management capabilities of your computer, display adapter, and software. Some computers can change the color palette to adjust the colors on your screen. See your software and hardware manuals for details.

❏ Exact color matching is very difficult. Check your software and monitor documentation for information on color matching and calibration.

Printed colors are different from those in the original image.

Exact color matching is very difficult. Check your software or contact your printer company for information on color matching and calibration.

The printed image is larger or smaller than the original.

The image size settings of your software determine the size of the printed image. Do not use the size of the monitor image to judge the printed size.

Scanned images cannot be printed or come out garbled when printed.

❏ Make sure your printer is properly connected to the computer, correctly set up, and maintained. See your printer manual for details.

❏ Check that your software is properly installed and set up for your printer. See your software manual.

Software Setup Problems

You cannot install EPSON TWAIN HS.

❏ Check if your PC and operating system meet the system requirements.

❏ Make sure your PC has enough memory to run the application.

The scanner does not appear in the Port list of the EPSON TWAIN HS dialog box in Control Panel when you connect the SCSI model to your PC running Windows 95 and NT 4.0.

❏ Turn off the PC and the scanner, and check the connection between your hardware. Unplug the SCSI cable and then plug it back in.

❏ Change the SCSI ID number to one that is not being used by any other SCSI devices. See your online *Setup Guide*.

❏ Check the connection sequence and make sure the terminator switch of the end device of daisy chain is set correctly. See your online *Setup Guide*.

The Scanner Status does not indicate "Device Ready" after you click Test in the EPSON TWAIN HS dialog box (Windows 95 and NT4.0) or in the Scanner's Properties dialog box (Windows 98, 2000, and Millennium Edition) in Control Panel.

❏ Make sure the interface cable meets the requirements of your interface board. See the manual that comes with the interface board.

❏ Turn off the PC and the scanner, and check the connection between them. Unplug the SCSI cable and plug it back in.

❏ Make sure the SCSI interface board is installed correctly.

❏ Turn off the scanner and the PC. Turn on the scanner and then turn on the PC.

❏ Make sure the SCSI driver is installed correctly.

❏ Change the scanner's SCSI ID number to one that is not being used by any other SCSI device. See "Changing the SCSI ID number or SCSI board" on page 4-21 in this guide or your online *Setup Guide*.

❏ Check the connection sequence and make sure the terminator switch of the end device of daisy chain is set correctly. See your online *Setup Guide*.

Software Operation Problems

You cannot start EPSON TWAIN HS.

❏ Turn on the scanner and then turn on the PC.

❏ Make sure the interface cable meets the requirements of your interface board. See the manual that comes with the interface board.

❏ Turn off the scanner and the PC and then check the connection between them.

❏ Make sure the interface board is installed correctly.

❏ Make sure that EPSON TWAIN HS is selected properly in your application software. See your online *Setup Guide*.

❏ Make sure your software is installed correctly.

For Windows 98, 2000, and Millennium Edition users:

In the Device Manager menu, make sure your scanner's name appears under Imaging Device hardware type without a question (?) mark or an exclamation (!) mark. If the scanner appears with a question (?) mark or an exclamation (!) mark, or as an Unknown devices hardware type, remove it while the scanner is still connected and turned on. Then reinstall EPSON TWAIN HS. See "Recovering from Scanner Software Installation Problems on Windows 98, 2000, and Millennium Edition" on page 4-26 for details.

Note:
If the EPSON Scanners Driver Disk is requested during the EPSON TWAIN HS reinstallation, insert the scanner software CD-ROM in the CD-ROM drive. Be sure to specify the correct drive letter, the **EPSON** *folder, the folder of your preferred language, and the* **Win98***,* **Win2000***, or* **WINME** *folder as the location.*

You cannot select Automatic Document Feeder.

Make sure the Automatic Document Feeder is installed correctly. See your online *Setup Guide.*

Scanning Problems

Image is dark, with little or no detail.

Calibrate the screen as described in "Calibrating Your Screen" on page 3-1.

You cannot scan an image or you only get a few dots for the scanned image.

❏ Make sure you have placed a document on the document table of the scanner.

❏ Change the Threshold setting in the Image Controls dialog box. See "Image Controls" on page 2-18.

Moiré (cross hatch) patterns appear in the scanned image during halftone scanning.

❏ Select the **24-bit Color De-screening** or **8-bit Gray De-screening** from the Image Type list box.

❏ Place a transparent sheet such as an overhead projector sheet between the document and document table to defocus the image.

❏ Reposition the document slightly.

❏ Make the image size slightly smaller.

Colors differ from the original or look strange.

❑ Calibrate the screen. See "Calibrating Your Screen" on page 3-1.

❑ Change the Image Type setting. See "Image Types" on page 2-4 to make sure your setting is correct.

❑ Printed colors do not exactly match the colors on your monitor, since printers and monitors use different color systems: monitors use RGB (red, green, and blue), while printers typically use CMYK (cyan, magenta, yellow, and black).

Scanned image is too large.

Change the image size setting in main window. See "Size" on page 2-6.

Poor character recognition during OCR scanning.

❑ Select **Black & White** as described in "Image Types" on page 2-4.

❑ Try adjusting the Threshold setting in the Image Controls dialog box.

❑ See "Optimizing OCR Scanning" on page 1-20 for more information.

You cannot scan from the Automatic Document Feeder.

❑ Make sure the Document Source setting is selected to **ADF-Single-sided** or **ADF-Double-sided**.

❏ Close the Automatic Document Feeder and try again. If the Automatic Document Feeder is opened while scanning, remove any jammed paper, and reload any document which has not yet been scanned and restart EPSON TWAIN HS.

❏ Take the jammed paper out and reload the document, then restart EPSON TWAIN HS.

Scanning does not start by pressing the Start button.

❏ Check that the power cord is connected and press the **OPERATE** button to turn on the scanner.

❏ **For Windows 98, 2000, and Millennium Edition users:**

Click the **Events** tab in your scanner's Properties dialog box and make sure the **Disable device events** check box is clear. Also, make sure the Start button is selected as the **Scanner events**, and at least one scanner event recognizable application in the **Send to this application** box is selected. See your online *Setup Guide* for details.

Scanned image by using the Start button is missing.

Make sure the desired application is assigned to the Start button.

Paper Jams

Paper gets jammed in the Automatic Document Feeder. Remove the jammed paper. See your online *Setup Guide*.

Network Problems

You cannot install EPSON TWAIN HS Network and/or EPSON Scan Server.

❏ Check that both your PC and operating system match the system requirements.

❏ Make sure your PC has enough memory (RAM) to run the application.

The scanner does not appear in the Scanner Selection box in the EPSON Scan Server setup dialog box. (For Windows 95 and NT 4.0 users)

❏ Turn off the scanner and PC, and check that they are connected properly.

❏ Make sure that a scanner supported by EPSON Scan Server and EPSON TWAIN HS Network is connected to the scanner server PC.

❏ Change the scanner's SCSI ID number to one that is not being used by any other SCSI device. See your online *Setup Guide*.

❏ Check the connection sequence and make sure the terminator switch of the end device of daisy chain is set correctly. See your online *Setup Guide*.

Status: unavailable appears under the General tab of the EPSON GT-30000 Properties dialog box. (For Windows 98, 2000, and Millennium Edition users)

❏ Turn off the scanner and PC, and check that they are connected properly.

❏ Make sure that a scanner supported by EPSON Scan Server and EPSON TWAIN HS Network is connected to the scanner server PC.

❏ Change the scanner's SCSI ID number to one that is not being used by any other SCSI device. See "Changing the SCSI ID number or SCSI board" on page 4-21 for details.

❏ Check the connection sequence and make sure the terminator switch of the end device of the daisy chain is set correctly. See your online *Setup Guide*.

❏ Install EPSON TWAIN HS (Version 1.0✽ or later) on the scanner server PC (the PC which is connected to the EPSON scanner).

You cannot start up EPSON Scan Server.

❏ Turn on the scanner and then your PC.

❏ Turn off the scanner and PC, and check that they are connected properly.

❏ Make sure the interface cable meets the requirements of your interface board. See the documentation that came with the interface board.

❏ Make sure the interface board is installed correctly.

❏ Make sure that a scanner supported by EPSON Scan Server and EPSON TWAIN HS Network is connected to the scanner server PC.

❏ **For Windows 98, 2000, and Millennium Edition users:** Install EPSON TWAIN HS (Version 1.0✲ or later) on the scanner server PC (the PC which is connected to the EPSON scanner).

EPSON TWAIN HS Network dialog box does not appear on the client PC when you try to start EPSON TWAIN HS Network from a TWAIN-compliant application.

❏ Turn on the scanner then the scanner server PC.

❏ Make sure that TCP/IP is selected as the networking protocol. See "Installing the TCP/IP Protocol" on page A-1.

❏ Make sure that the cables which connect the EPSON scanner, the scanner server PC and the client PC meet system requirements and are properly connected.

❏ Make sure the interface card is installed correctly.

❏ Enter the correct IP address in the EPSON TWAIN HS Network setup dialog box.

❏ Make sure that one of the naming services such as DNS, WINS, or LMHOSTS is used in your network. Otherwise use the IP address to specify the scanner server PC in the TWAIN HS Network setup dialog box.

Network connection is terminated before the scanned image is transferred to the client PC.

Check the time out setting and increase the value, if necessary. See your online *Setup Guide*.

Changing the SCSI ID number or SCSI board

If you are using your scanner with Windows 98, 2000, or Millennium Edition and you want to change the scanner's SCSI ID number or replace the SCSI board with a new one, follow the steps below.
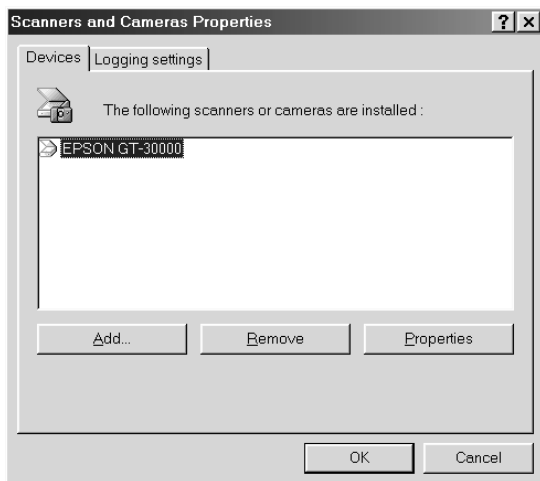
Note:
If you do not follow these steps, your scanner or PC may not operate correctly.

1. Double-click the **Scanners and Cameras** icon in Control Panel.
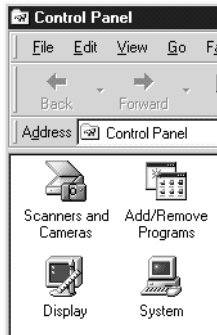
2. Select your scanner from the installed devices list, and then click **Remove**.

3. Click **OK**.

4. Shut down Windows 98, 2000, or Millennium Edition and turn off your PC and the scanner.

5. Change the SCSI ID number (see your online *Setup Guide*), or replace the SCSI board.

6. Turn on your scanner and then your PC.

7. Follow the instructions on the screen.

Note:
If the EPSON Scanners Driver Disk is requested, insert the Scanner Software CD-ROM in the CD-ROM drive and make sure to specify the correct drive letter, the **EPSON** *folder, the folder of your preferred language, and the* **Win98**, **Win2000**, *or* **WINME** *folder as the location.*

Upgrading the System

Upgrading from Windows 98 or 95 to Windows Millennium Edition

If you are using your EPSON scanner with your PC running Windows 98 or 95 and are planning to upgrade your system to Windows Millennium Edition, you need to uninstall EPSON TWAIN HS before upgrading your operating system, as described below.

1. Uninstall EPSON TWAIN HS. See "Uninstalling EPSON TWAIN HS" on page 4-23.

2. Turn off your PC and scanner, and then disconnect your scanner from your PC.

3. Turn on your PC and then install Windows Millennium Edition.

4. Make sure that Windows Millennium Edition is installed correctly, and then shut down your PC.

5. Connect your scanner and then start your PC to install EPSON TWAIN HS following the instructions in your online *Setup Guide*.

Uninstalling EPSON TWAIN HS

For Windows 95 or NT 4.0 users:

1. Click the **Start** button on the Windows task bar and point to **Programs**, select **EPSON Scanner**, and then click **EPSON TWAIN HS Uninstall**.

2. Click **Yes** to uninstall.

3. Click **OK** to finish.

For Windows 98 users:

1. Connect your scanner to your PC. Turn on your scanner then your PC.

2. Click the **Start** button on the Windows task bar and point to **Settings**, and then select **Control Panel**.

3. Double-click the **Scanners and Cameras** icon.

4. Select your scanner from the installed devices list, and then click **Remove**.

5. Click **OK** to close the dialog box.

Upgrading from Windows 98, 95, or NT 4.0 to Windows 2000

If you are using your EPSON scanner with your PC running Windows 98, 95, or NT 4.0 and are planning to upgrade your system to Windows 2000, you need to uninstall EPSON TWAIN HS before upgrading your operating system, as described below.

1. Uninstall EPSON TWAIN HS. See "Uninstalling EPSON TWAIN HS" on page 4-23.

2. Turn off your PC and scanner, and then disconnect the scanner from your PC.

3. Turn on your PC and then install Windows 2000.

4. Make sure that Windows 2000 is installed correctly, and then shut down your PC.

5. Connect your scanner and then start your PC to install EPSON TWAIN HS following the instructions in your online *Setup Guide*.

During Windows 2000 installation

While you are installing Windows 2000, if a dialog box similar to the one shown below appears and asks for the updated files for your scanner, click **Next** and continue the installation. Do not click **Provide Files...**.

Note:
If you insert the Scanner Software CD-ROM and click **Provide Files...***, an error message may appear. Replace the scanner software CD-ROM with the Windows 2000 CD-ROM and continue installing Windows 2000. After finishing the Windows 2000 installation, you need to uninstall your scanner from the Device Manager and reinstall EPSON TWAIN HS. Follow the instructions described in "Recovering from Scanner Software Installation Problems on Windows 98, 2000, and Millennium Edition" on page 4-26 to uninstall EPSON TWAIN HS.*

Upgrading from Windows 95 to Windows 98

If you are using your EPSON scanner with your PC running Windows 95 and are planning to upgrade your system to Windows 98, you need to uninstall EPSON TWAIN HS before upgrading your operating system, as described below.

1. Uninstall EPSON TWAIN HS. See "Uninstalling EPSON TWAIN HS" on page 4-23.

2. Turn off your PC and scanner, and then disconnect the scanner from your PC.

3. Turn on your PC and then install Windows 98.

4. Make sure that Windows 98 is installed correctly, and then shut down your PC.

5. Connect your scanner and then start your PC to install EPSON TWAIN HS following the instructions in your online *Setup Guide*.

Recovering from Scanner Software Installation Problems on Windows 98, 2000, and Millennium Edition

If you cancelled the plug and play driver installation before the procedure was completed, or if you do not follow the installation instructions for EPSON TWAIN HS for Windows 2000 and Millennium Edition, EPSON TWAIN HS will not be properly installed on your PC. To correct this problem, first remove the scanner from your system in Device Manager following the instructions below, and then reinstall EPSON TWAIN HS following the instructions in your online *Setup Guide*.

Follow the steps below to check the installation.

Note for Windows 2000 and Millennium Edition users:
The screen shots shown in this section are for Windows 98, so they may vary in appearance from the actual dialog boxes that appear on your screen. The instructions are the same, however, except as noted.

1. Plug the interface cable into your scanner and the PC.

2. Turn on your scanner and then your PC.

3. Right-click the **My Computer** icon on your desktop, then click **Properties**.

   For Windows 98 and Millennium Edition users:
   Click the **Device Manager** tab.

   For Windows 2000 users:
   In the System Properties dialog box, select the **Hardware** tab then click **Device Manager**.

4. If your EPSON TWAIN HS is correctly installed, **EPSON GT-30000** should appear under Imaging Device when you click the plus (+) sign next to Imaging Device.

   If **EPSON GT-30000** appears under Other devices with a question (?) mark or under Imaging Device with an exclamation (!) mark, the EPSON TWAIN HS file is not installed correctly.
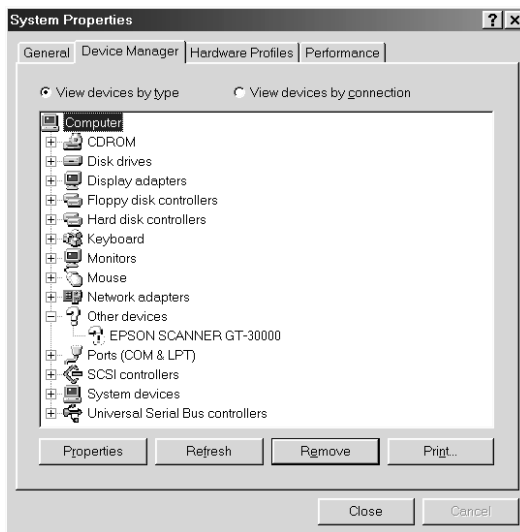
EPSON GT-30000 appearing under Other devices with a question (?) mark
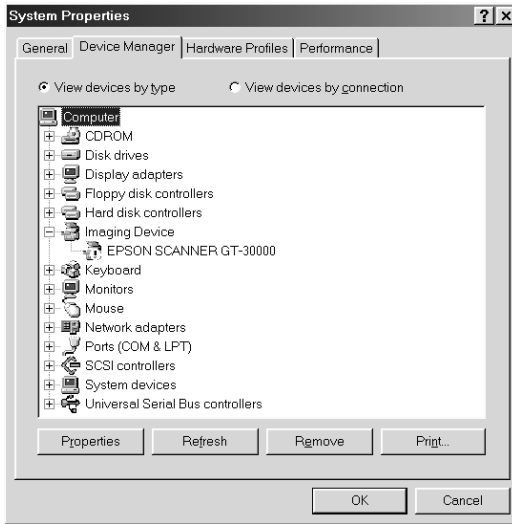
EPSON GT-30000 appearing under Imaging Device
with an exclamation (!) mark

If **EPSON GT-30000** appears under Other devices with a
question (?) mark, see "If EPSON GT-30000 appears under Other
devices with a question (?) mark" on page 4-28. If **EPSON GT-
30000** appears under Imaging Device with an exclamation
(!) mark, see "If EPSON GT-30000 appears under Imaging Device
with an exclamation (!) mark" on page 4-29.

If EPSON GT-30000 appears under Other devices with a question (?) mark

Note:
Make sure your scanner is turned on and connected to your PC. If your
scanner is off or not connected to your PC, you cannot reinstall the driver
properly.

1.   For Windows 98 and Millennium Edition users, click
     ? EPSON GT-30000, then click **Remove** and **OK**.

     For Windows 2000 users, right-click **? EPSON GT-30000**,
     then select **Uninstall** and click **OK**.

2.   Click **OK** to close the System Properties window.

3.   Shut down your PC and turn off your scanner. Then turn on
     your scanner and your PC.

4.   When the message prompting you to install the driver
     appears, install the driver again. See your online *Setup Guide*.

If EPSON GT-30000 appears under Imaging Device with an exclamation (!) mark

Note:
*Make sure your scanner is turned on and connected to your PC. If your
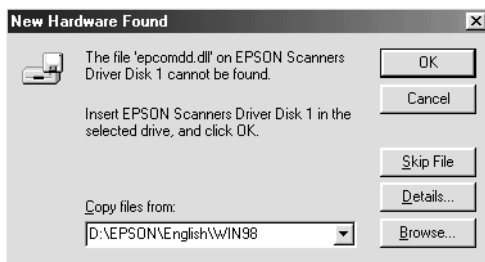scanner is off or not connected to your PC, you cannot reinstall the driver
properly.*

1. For Windows 98 and Millennium Edition users, click
    ! EPSON GT-30000, then click **Remove** and **OK**.

    For Windows 2000 users, right-click **! EPSON GT-30000**,
    then select **Uninstall** and click **OK**.

```
Confirm Device Removal                              ? X
    ┌───┐
    │   │    EPSON SCANNER GT-30000
    └───┘

Warning: You are about to remove this device from your system.

                              [    OK    ]   [  Cancel  ]
```

2. Click **OK** to close the System Properties window.

3. Shut down your PC and turn off your scanner. Then turn on
    your scanner and your PC.

4. When a message appears to prompt you to insert the scanner
    software CD-ROM, insert the CD-ROM in the CD-ROM drive,
    and then click **OK**.

    If the following dialog appears, click ▼, then browse and
    select, or type in the CD-ROM drive letter, the **EPSON** folder,
    the folder of your preferred language, and the **Win98**,
    Win2000, or **WINME** folder as the location as shown below.
    Finally, click **OK**.

```
New Hardware Found                                      X
    ┌───┐   The file 'epcomdd.dll' on EPSON Scanners      [    OK    ]
    │   │   Driver Disk 1 cannot be found.
    └───┘                                                 [  Cancel  ]
            Insert EPSON Scanners Driver Disk 1 in the
            selected drive, and click OK.                 [ Skip File ]

                                                          [ Details... ]
            Copy files from:
            [D:\EPSON\English\WIN98        ▼]             [ Browse... ]
```

5. The Screen Calibration window appears. Follow the instructions described in your online *Setup Guide.*

Sizing up Your System

Your scanner is sufficient for most scanning needs, but if you are not satisfied with the quality of the images on your monitor or with the speed of image processing, read this section. While it does not contain specific recommendations, it describes various possibilities for improving your scanning system. For further information, seek advice from your dealer or an experienced scanner user.

RAM and hard disk size

Scanned images use much more memory than text files, so you may need more RAM (Random Access Memory) in your PC and a larger hard disk than you have used previously.

Video cards

A video card that is sufficient for text may not be good enough for displaying graphic images, especially in color. If all your scanned images look coarse on your monitor, you may want to upgrade your video card. You will need 24-bit color, also called true color or millions of colors, to make the highest quality image reproductions.

Monitors

The resolution of your monitor affects the quality of the image you see. Consider a high resolution monitor if you do precise color work, but also be sure you have a high quality video card.

File compression software

Many different programs are available to make image files smaller for storage or transmission. For example, some compression software can store a 3MB image file on a 1.44MB floppy disk, and compress images and restore them with no loss of data or quality; others compress images more, but the restored file is not exactly the same as the original. The difference between the original and restored files is, however, almost unnoticeable.

Contacting Customer Support

If your EPSON product is not operating properly and you cannot solve the problem using the troubleshooting information in your product documentation, contact customer support services for assistance or contact the dealer where you purchased your product.

Customer support will be able to help you much more quickly if you give them the following information.

❏ Product serial number
  (The serial number label is usually on the back of the product.)

❏ Product model

❏ Product software version
  (Click **About**, **Version Info**, or similar button in the product software.)

❏ Brand and model of your computer

❏ Your computer operating system name and version

❏ Names and versions of the software applications you normally use with your product

Appendix A

Setting up the Scanner Server PC

Setting up the Scanner Server PC

To allow networking, the scanner server PC and the client PCs in the network require a Network Interface Card and a Network Interface Card (NIC) driver. Install the Network Interface Card and Network Interface Card (NIC) driver in the scanner server PC and the client PCs. For installation procedures, refer to the corresponding manuals included with the card.

Installing the TCP/IP Protocol

Installing the TCP/IP protocol (Windows Millennium Edition, 98, and 95)

To install the TCP/IP protocol on the scanner server PC and client PCs on the network, follow the instructions below.

1. Click the **Start** button on the Windows task bar and point to **Settings**, then select **Control Panel**.

    The Control Panel window appears.

2. Double-click the **Network** icon in Control Panel.

The Network dialog box appears.

3. Click the **Configuration** tab.

4. Check that TCP/IP protocol is included in the The following
    network components are installed list box.
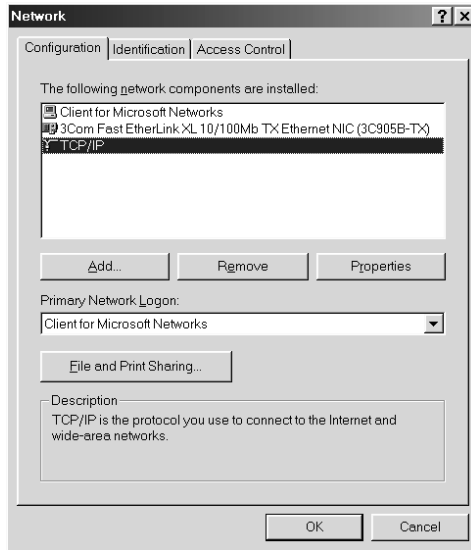
If the TCP/IP protocol appears in the list box, proceed to the
following section "Setting the Scanner Server PC's IP
Address" on page A-10. Otherwise, proceed to step 5.

5. Click **Add**.

    The Select Network Component Type dialog box appears.

6. Select **Protocol** from the list and click **Add**.
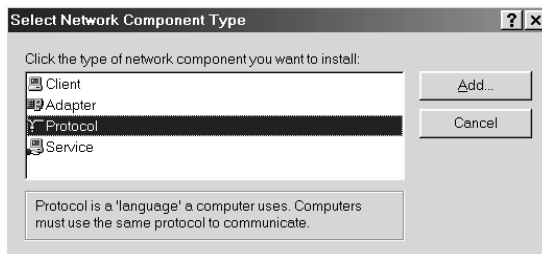
7. Select **Microsoft** from Manufacturers list box and **TCP/IP** from Network Protocols, and click **OK**.
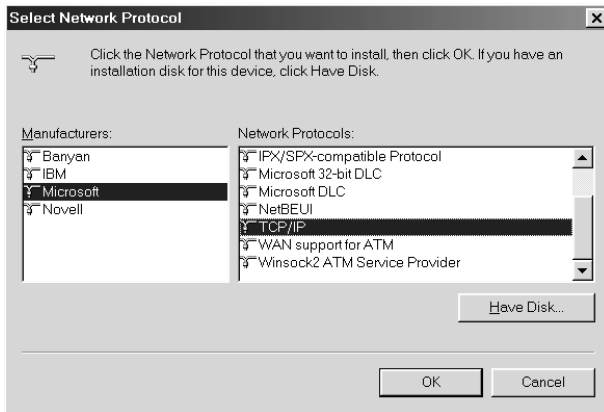
8. Follow the instructions displayed on the screen. After you finish this step, proceed to the section "Setting the Scanner Server PC's IP Address" on page A-10.

Installing the TCP/IP protocol (Windows 2000)

To install the TCP/IP protocol on the scanner server PC and client PCs on the network, follow the instructions below.

1. Right-click the **My Network Places** icon and select **Properties**.
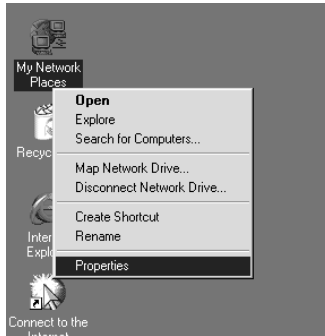
2. Double-click **Local Area Connection**.
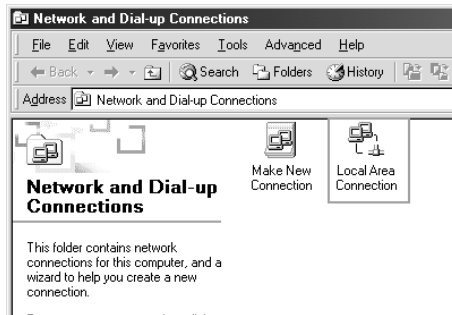
3. Click **Properties**.

4. Check that **Internet Protocol (TCP/IP)** is included in the Local Area Connection Properties list box.
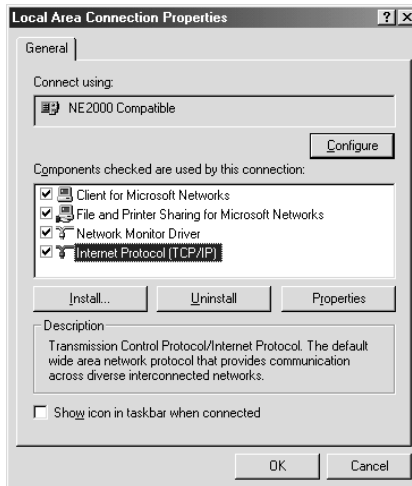
If the Internet Protocol (TCP/IP) appears in the list box, proceed to "Setting the Scanner Server PC's IP Address" on page A-10. Otherwise, proceed to step 5.

5. Click **Install**. The Select Network Component Type box appears.

6. Select **Protocol** from the list and click **Add**.
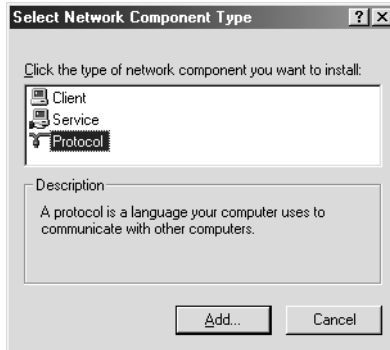
7. Select **Internet Protocol (TCP/IP)** in the **Network Protocol** list box and click **OK**.
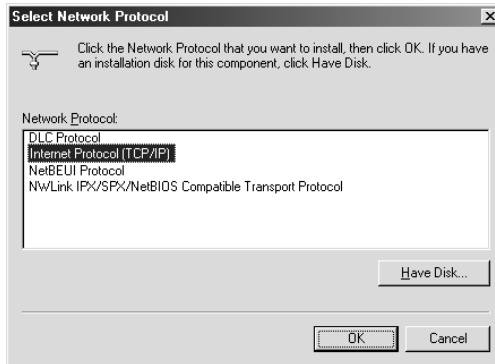
8. Check that Internet Protocol is installed and click **Close**. After you finish this setup, proceed to "Setting the Scanner Server PC's IP Address" on page A-10.

Installing the TCP/IP protocol (Windows NT 4.0)

To install the TCP/IP protocol on the scanner server PC and client PCs on the network, follow the instructions below.

1. Click the **Start** button on the Windows task bar and point to **Settings**, then select **Control Panel**.

    The Control Panel window appears.

2. Double-click the **Network** icon in Control Panel.

3. Click the **Protocols** tab.

4. Check that TCP/IP Protocol is included in the Network Protocols list box.
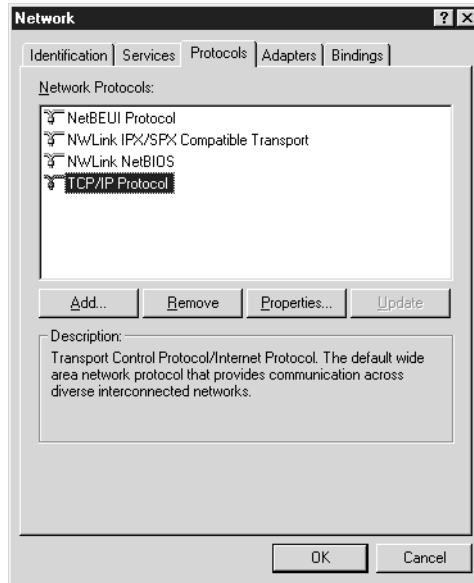
If TCP/IP Protocol already appears in the list box, proceed to the section "Setting the Scanner Server PC's IP Address" on page A-10. Otherwise, proceed to step 5.

5. Click **Add**.

The Select Network Protocol dialog box appears.

6. Select **TCP/IP Protocol** in the **Network protocol** list box and
    click **OK**.
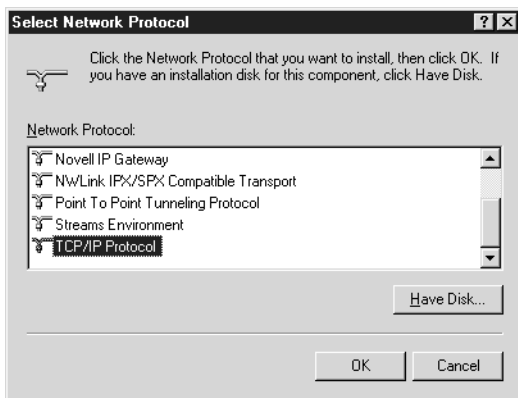
7. Follow the instructions displayed on the screen. After you
    finish this step, proceed to the section "Setting the Scanner
    Server PC's IP Address" on page A-10.

Setting the Scanner Server PC's IP Address

To use EPSON scanners in a network environment, you need to
assign IP addresses to the scanner server PC and client PCs.

If EPSON scanners are installed in an internal LAN (Local Area
Network), that is, isolated from the Internet, the following IP
addresses can be assigned to the scanner server PC.

Note:
*If you use IP addresses from these ranges, you will not be able to connect
this LAN to the Internet in the future, otherwise there will be IP address
conflicts.*

10.0.0.0 - 10.255.255.255
172.16.0.0 - 172.31.255.255
192.168.0.0 - 192.168.255.255

If you plan to use a scanner server PC in a network connected to the Internet, you should acquire a formal IP address for the scanner server PC from the Internet organization of your country.

Assigning an IP address to a scanner server PC on Windows Millennium Edition/98/95

1. Click the **Start** button on the Windows task bar and point to **Settings**, then select **Control Panel** and double-click the **Network** icon to open the Network dialog box.

    The Network dialog box appears with Configuration tab on the top.

2. Select **TCP/IP** in the list box and click **Properties**.
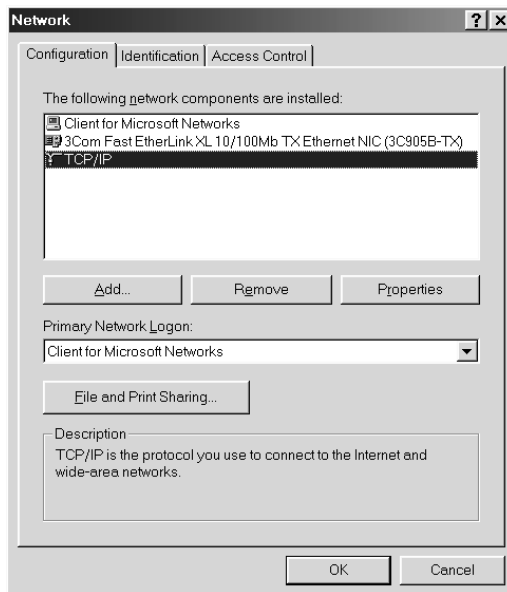
The TCP/IP Properties dialog box appears.

3. Click the **IP Address** tab.

4. If you are using a DHCP server on the network, you can assign an IP address to the scanner server PC automatically by selecting **Obtain an IP address automatically** and clicking **OK**. To manually assign an IP address, select **Specify an IP address** and then enter the IP Address and Subnet Mask. Click **OK**.
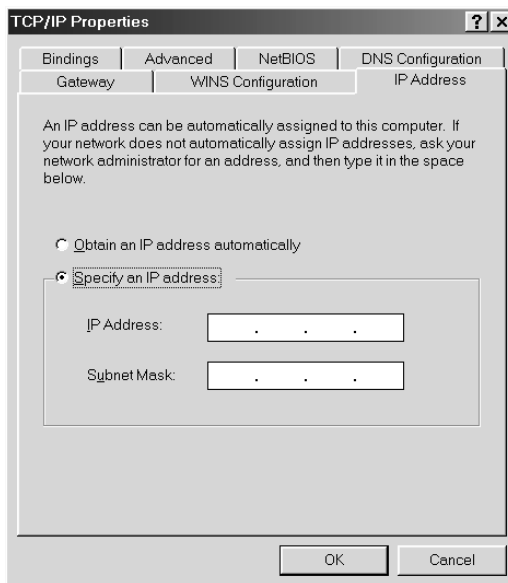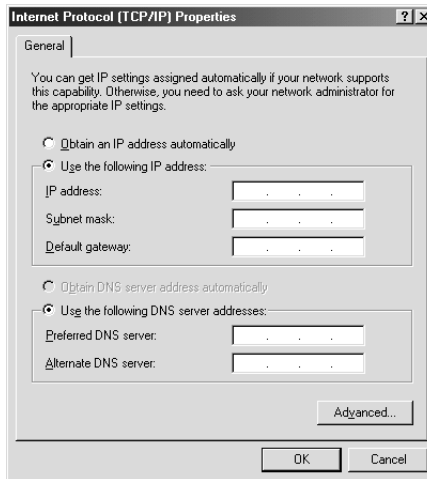

Assigning an IP address to a scanner server PC on Windows 2000

1. Right-click the **My Network Places** icon, then select **Properties** and double-click **Local Area Connection**.

2. Click **Properties**.

3. Select **Internet Protocol (TCP/IP)** in the list box, and then click **Properties**.
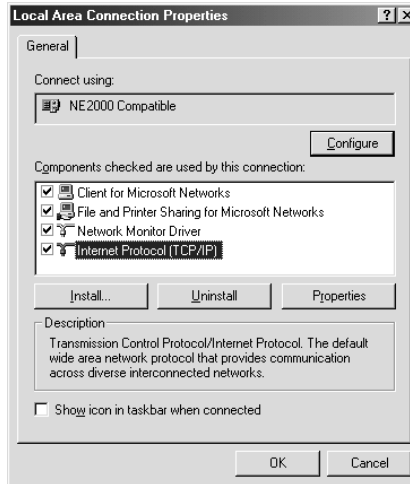
4. Select **Use the following IP address**, then enter the IP address. Click **OK** to close the dialog box.

Note:
❑ *Make the settings appropriate for your network.*

❑ *Confirm the IP address and other network settings with your network administrator.*

5. Click **OK** to close the Local Area Connection Properties dialog box, then click **Close** to close the Local Area Connection Status dialog box.

Assigning an IP address to a scanner server PC on Windows NT 4.0

1. Click the **Start** button and point to **Settings**, then select **Control Panel** and double-click the **Network** icon in Control Panel.

   The Network dialog box appears with the Identification tab on the top.

2. Click the **Protocols** tab.

3. Select **TCP/IP Protocol** in the list box and click **Properties...**.
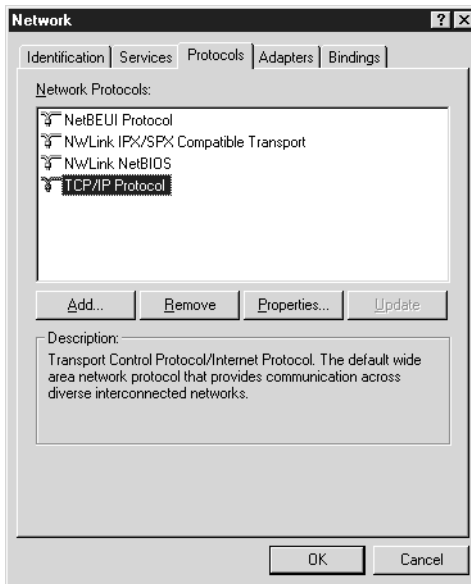
The Microsoft TCP/IP Properties dialog box appears.

4. If you are using a DHCP server in your network, you can assign an IP address to your scanner server PC by selecting **Obtain an IP address from a DHCP server** and clicking **OK**. To manually assign an IP address, select **Specify an IP address** then enter the IP Address, Subnet Mask and Default Gateway. Click **OK**.
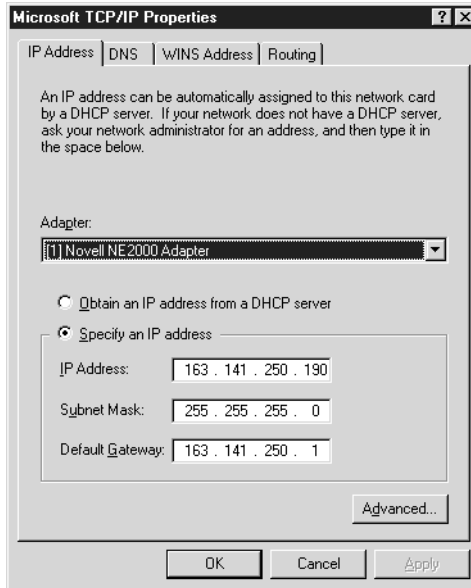
Connecting the Scanner to the Scanner Server PC

Connect the EPSON scanner to your scanner server PC. Refer to the online *Setup Guide* of your scanner for details.

Appendix B

Technical Specifications

Scanning

Scanner type:	Flatbed, color
Photoelectric device:	Color CCD line sensor
Effective pixels:	7020 $\times$ 10200 pixels at 600 dpi, 100%
Document size:	297 $\times$ 432 mm A3 or US B (Ledger) size (The reading area can be specified from your software.)
Scanning resolution:	600 dpi (main scan) 1200 dpi (sub scan)
Output resolution:	50 to 4800 dpi (1 dpi steps) and 9600 dpi
Color separation:	RGB color filters on CCD
Reading sequence:	
Monochrome	One-pass scanning
Color byte sequence	One-pass scanning (R, G, B)
Color line sequence	One-pass scanning (R, G, B)
Zoom:	50 to 200% in 1% increments
Image data:	12 bits per pixel per color internal 1 or 8 bits per pixel per color external
Brightness:	7 levels (In EPSON TWAIN HS, Gamma correction controls Brightness)
Line Art settings:	Fixed threshold

Halftoning process:	4 dither patterns (A, B, C, and D) for bi-level (2 downloadable dither patterns)
Gamma correction:	2 types for CRT display 3 types for printer output 1 type for user-defined (Only user-defined Gamma correction is available in EPSON TWAIN HS)
Color correction:	1 type for CRT display 3 types for printer output 1 type for user-defined (Only user-defined Color correction is available in EPSON TWAIN HS)
Interface:	SCSI (50 pin half pitch connectors), SCSI (68 pin half pitch connectors), Optional IEEE 1394 Serial Bus Interface
Light source:	Xenon gas fluorescent lamp
Reliability:	200,000 cycles of carriage movement (main unit MCBF)
Dimensions:	Width: 658 mm Depth: 488 mm Height: 254 mm with Automatic Document Feeder
Weight:	Approx. 30kg with Automatic Document Feeder

Electrical

Input voltage range	AC 198 to 264 V
Rated frequency	50 to 60 Hz
Input frequency	49.5 to 60.5 Hz
Rated current	0.5 A
Power consumption	Approx. 90W with option

Note:
Check the label on the back of the scanner for voltage information.

Environmental

Temperature:	
Operation	5 to 35°C
Storage	-25 to 60°C
Humidity:	
Operation	10 to 80%, without condensation
Storage	10 to 85%, without condensation
Operating conditions:	Ordinary office or home conditions. Extreme dust should be avoided. Operation under direct sunlight or near a strong light source should be avoided.

Note:
Specifications are subject to change without notice.

Standards and Approvals

Low Voltage Directive 73/23/EEC   EN 60950
EMC Directive 89/336/EEC   EN 55022 Class B
                                               EN 55024
                                               EN 61000-3-2
                                               EN 61000-3-3

SCSI Interface

Interface type:	ANSI X3T9.2/375R Revision 10L (SCSI 2)
Functions:	BUS FREE phase
	ARBITRATION phase
	SELECTION/RESELECTION phase
	COMMAND phase
	(Logical Unit Number is fixed to 0 and
	command link function is not supported.)
	DATA phase
	DATA IN phase
	DATA OUT phase
	STATUS phase
	MESSAGE phase
	MESSAGE IN phase
	MESSAGE OUT phase
	ATTENTION condition
	RESET condition
Logic level:	TTL compatible
Electrical standard:	ANSI X3T9.2/375R Revision 10L (SCSI 2)

ID Setting:	Selectable from 0 to 7 (Default SCSI ID number is 2.)
Terminator:	Internal terminator selectable (enable/disable)
Data Bus Length:	W mode: 8 bit or 16 bit data bus according to negotiation N mode: only 8 bit data bus
Connector type:	Half pitch 50-pin connectors Half pitch 68-pin connectors

Connector pin arrangement:

Half pitch 50-pin connectors

Half pitch 68-pin connectors

Interface Connector

Interface type:	For use with the Automatic Document Feeder only.
Electrical specifications:	
Output voltage:	DC 21.6 to 26.4V DC 4.75 to 5.25V

Initialization Methods

The scanner can be initialized (returned to a fixed set of conditions) in the following ways:

SCSI

Hardware initialization	*The scanner is turned on. *The scanner receives a SCSI Reset signal from the SCSI interface.
Software initialization	*Software sends the ESC @ (initialize the scanner) command. *The scanner receives a SCSI Bus Device Message.

Automatic Document Feeder

General specifications:

Paper feed:	1 to N, face up load
Paper out:	Face down eject
Paper setting quantity:	100 pcs paper (80 g/m² paper, maximum total thickness under 12 mm)

Reliability:	100,000 sheets (Load/Eject MCBF)
Weight:	Approx. 13 kg

IEEE 1394 Interface Board

Interface type:	IEEE 1394-1995 compatible
Data transfer method:	Half-duplex Data/Strobe differential serial
Synchronization method:	Clock synchronization with DS-Link
Encoding/decoding:	DS-Link
Logic level:	3.3 V
Compatible connectors:	IEEE 1394-1995 compatible

Connector pin signal layout:

Pin number	Signal name	Function
1	VP	Cable power supply
2	VG	Cable ground
3	TPB*	Strobe during receipt, data during transmission (differential pair)
4	TPB	
5	TPA*	Data during receipt, strobe during transmission (differential pair)
6	TPA	

Power class:

Power class code 100
No power supply from external sources
Fitted with a repeat function with bus power

Glossary

additive primary colors
The colors of red, green and blue (RGB) - which give the perception of white when combined equally. These are the colors of the color system used by monitors and scanners.

bi-level data
Image data that is composed of 1 bit per pixel. A pixel is represented by a single bit of digital data that can be expressed as only 1 (light) or 0 (dark).

bit
Short for binary digit. The smallest unit of data in computer processing. A bit can represent one of two values: on, represented by a 1, or off, represented by a 0.

bit/pixel
The unit that indicates the number of bits allocated for a pixel. The larger the bit value, the more detail of a pixel will be reproduced.

brightness
A scanner function to lighten or darken the output image data.

byte
A unit of information consisting of eight bits. A byte can represent a control code or character.

carriage
A component of the scanner that contains the optical sensor and light source for scanning.

color correction
A method of adjusting the color image data for a particular type of device so that the reproduction results are as close as possible to the original colors.

color separation
A process of converting full-color images into a limited number of primary colors. Additive primary colors (red, green, and blue) are used by the scanner, and the subtractive primary colors (cyan, magenta, and yellow) plus black are used for printing press separation.

daisy chain
A SCSI bus arrangement that allows several devices to be connected simultaneously in a line to a single computer. See *SCSI*.

default
A set of values used when no other selections have been made. These are sometimes called factory defaults if the original values have not been changed since the scanner left the factory.

Default Gateway (Address)
The IP address of a special device used to route data from one part of a network using TCP/IP to another. See also *IP address*, *TCP/IP*, and *Internet*.

DHCP
Dynamic Host Configuration Protocol, a TCP/IP network protocol that enables hosts to obtain temporary IP addresses from one or more centrally administered servers.

DHCP server
Dynamic Host Configuration Protocol server, a computer which has been configured to respond to DHCP requests from other computers on the network.

dithering
A process in which software or an output device simulates continuous tones with groups of dots.

DNS
Domain Name System, a naming service which allows the looking up of IP addresses based on host (domain) names.

document
The item, such as a sheet of paper or a book, that is placed on the document table for the scanner to read.

dpi
Short for dots per inch. A unit of measurement for resolution. The higher the value, the higher the resolution.

dropout color
A color the scanner does not recognize and ignores. You can select and deselect dropout colors in the scanner software.

ESC/I
Abbreviation for EPSON Standard Code for Image scanners. A system of commands that allows you to control image scanners from your software.

ESC/P
Abbreviation for EPSON Standard Code for Printers. A system of commands that allows you to control printers from your software.

gamma
Gamma is a value that expresses the relationship between the input and output of a device. By adjusting the gamma, the brightness of the mid-tones of an image can be changed without affecting the shadows and highlights.

grayscale
Images represented with various shades of gray in addition to black and white.

halftoning
A method of reproducing images with patterns of dots to improve the quality of the output.

home position
The position at the rear (nearest the cover hinge position) of the scanner where the carriage rests before a scanning operation.

interface
A piece of hardware, a method, or a standard used for connection between or among computer devices.

Internet
A worldwide network of computers and communication devices, the largest of its kind, originally conceived as a research project of the US government. The Internet is composed of many different types of connections, including electrical and fiber optic cabling as well as wireless communications.

IP address
Internet Protocol address, a numeric address which uniquely identifies a computer connected to a network using TCP/IP, such as the Internet. See also *Internet* and *TCP/IP*.

LAN
Short for Local Area Network, a computer network in which the attached devices are in close proximity (like in the same office or building).

line sequence
A type of color scanning that separates primary colors line by line. The carriage makes only one pass.

LMHOSTS
A file of IP addresses and their associated host (domain) names. An IP address and its associated host (domain) name can be found by referring to this file.

moiré
A moiré is a cross-hatch pattern that appears on scanned images when scanning printed material. It is a result of interference that occurs due to the difference between the pitches of the scanning and the halftone screens.

monochrome
Black and white images, or images represented only by the intensity of luminosity.

Network Interface Card
A name for the adapter (printed circuit board), installed in a PC, that enables it to communicate over a LAN.

OCR
Optical Character Recognition
The technology that allows computers to "read" text from physical objects. OCR requires a graphical representation of text to interpret, which usually comes from a scanned image.

page sequence
The type of color scanning in which the entire image is scanned once for each separate color.

pixel
Short for picture element. Each image is composed of a number of pixels. Pixels are also counted in units of dots.

plain bi-level
Bi-level image data without the halftoning process.

port
An interface channel through which data is transmitted between devices.

primary colors
Basic colors. See *additive primary colors* and *subtractive primary colors.*

resolution
Indication of how finely an image is resolved into pixels. Can be measured in dots per inch (dpi), pixels per inch (ppi), or samples per inch (spi).

scan
An operation performed by the sensor and the carriage. The image is divided into pixels by scanning.

scanning area
The physical size of the image that can be scanned by the scanner.

screen calibration
Adjustment of the monitor display to reproduce as closely as possible the original image data.

SCSI
Small Computer System Interface. This is one method used to connect your computer to peripherals such as scanners, hard disk drives, CD-ROM drives, and others.

SCSI ID
The numbers that all devices in a SCSI connection (see *daisy chain*) use to identify each other. If the same ID number is used by two devices in the same daisy chain, the devices cannot operate properly.

Subnet mask
A numeric designation, with the same format as an IP address, which determines how much of an IP address is used to partition a network using TCP/IP into smaller entities called subnets. See also *IP address, TCP/IP,* and *Internet.*

subtractive primary colors
The colors of cyan, magenta, and yellow (CMY) which produce black when mixed in certain amounts. In printing, black is often added to give more definition as mixing of actual inks cannot produce pure black.

TCP/IP

A widely used family of protocols for communicating data between computers in a network.

terminator

A device that stops electronic signals, and prevents them from proceeding or returning to other devices. This is necessary to stop a signal from continuously reflecting between devices.

threshold

A reference point that is used to determine whether data will be processed as "on" or "off". In the case of color image data, "on" means that a certain color will appear in a pixel or dot, and "off" means that color will not appear there.

tone correction

A method of adjusting the tone curve so that the reproduction results on different types of output devices have gradations similar to the original image.

tone curve

The graph that shows the contrast ratio between the input (original image) and output (image data) in image processing.

unsharp mask

Originally a photographic process in which a sharply focussed and a slightly out-of-focus image are combined to produce a sharper image. This process is simulated by software to produce the same effect.

WINS

Windows Internet Naming Service, a naming service which allows the looking up of IP addresses based on host (domain) names.

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