

EPSON®

EPSON PERFECTION 1250
EPSON PERFECTION 1650
EPSON PERFECTION 1250 PHOTO
EPSON PERFECTION 1650 PHOTO

Color Image Scanner

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Reference Guide

Contents

Introduction

About This Guide	1
Where to Find Information	2

Chapter 1 Getting to Know Your Scanner

Scanner Parts	1-1
Light and Buttons	1-2
Light	1-3
Buttons	1-4

Chapter 2 Scanning an Image

Overview	2-1
Scanning reflective documents	2-1
Scanning transparent materials	2-2
About TWAIN	2-3
About TWAIN-compliant applications	2-3
About EPSON TWAIN	2-3
Placing a Document on the Scanner	2-4
Scanning from the Full Auto Mode	2-8
Saving a Scanned Image	2-13
Customizing the Full Auto Mode Settings	2-14

Chapter 3 Using the Film Adapter

For Perfection 1250 Users	3-1
Unpacking the Film Adapter	3-1
Installing the Film Adapter	3-2
Loading a film or a slide	3-3
Scanning normal (reflective) documents	3-8

For Perfection 1650 Photo Users	3-9
Unpacking	3-9
Removing and attaching the reflective document mat . . .	3-9
Loading a film or slides	3-11
Scanning normal (reflective) documents	3-16
For Perfection 1650 Users	3-16
Unpacking the Film Adapter	3-17
Removing the document cover	3-18
Removing the integrated TPU (for Perfection 1650 Photo users)	
3-19	
Installing the Film Adapter	3-21
Film holders	3-22
Loading a film or slides	3-24
Scanning normal (reflective) documents	3-30

Chapter 4 Scanning from the Manual Mode

Overview of the Manual Mode Window	4-1
Selecting a Document Source	4-4
Selecting an Image Type	4-5
Image Type list	4-6
Image Type button	4-8
Selecting a Destination	4-13
Destination list	4-14
Destination button	4-14
Selecting the Resolution	4-16
Using the Preview Buttons	4-17
Using the Scan Button	4-17

Chapter 5 Using the Preview Window

Overview of the Preview Window	5-1
Preview	5-1
Thumbnail preview	5-2
Preview	5-4
Using the Full Preview button	5-5
Using the Zoom Preview button	5-5

Using a marquee	5-5
Using the Auto Locate button	5-7
Thumbnail Preview	5-8
Using the Full Preview button	5-11
Using the Zoom Preview button	5-12
Using the 90 Degrees Rotate button	5-13
Using the Mirroring button	5-13
Selecting the Unsharp Mask	5-13
Specifying Source and Target Image Sizes	5-14
Using the Auto Exposure Button	5-17

Chapter 6 Optimizing Images on the Manual Mode

Recommended Adjustment Order	6-1
Adjusting Brightness and Contrast	6-2
Adjusting the Highlight setting	6-2
Adjusting the Shadow setting	6-4
Adjusting the Gamma setting	6-5
Applying a preset tone curve	6-6
Adjusting Color	6-11
Adjusting the Gray Balance Intensity setting	6-11
Adjusting the Saturation setting	6-13
Using the tone curve	6-13
Customizing your own tone curve	6-17
Using the Reset Button	6-17
Optimizing Text Scanning for OCR	6-18
Scanning text	6-18
Improving character recognition	6-18
Potential text recognition problems	6-19

Chapter 7 Customizing the Manual Mode Settings

Using the Settings Dialog Box	7-1
Making Configuration Settings	7-2
Preview menu	7-3
Color menu	7-4
Other menu	7-8

Chapter 8 Scanning by Using the Buttons

Buttons on the Scanner	8-1
Using the Start Button	8-2
Using the Photo Print Button	8-3
Using the Scan to E-mail button	8-4
Using the Scan to Web Button	8-7
Assigning Another Application to the Buttons on Windows . .	8-10
Assigning an application to the buttons	8-11
Disabling the buttons	8-14

Chapter 9 EPSON Smart Panel

Overview	9-1
Starting EPSON Smart Panel	9-1
About Applications in the EPSON Smart Panel Window	9-2
Copy	9-3
Scan to E-mail	9-4
Scan to OCR	9-5
Scan to Application	9-6
Scan for Creativity	9-7
Scan to Web	9-8
Scan to File	9-9
Photo Print	9-10
Photoshop (for Perfection 1650 Photo users)	9-10
Assigning an Application in the EPSON Smart Panel Window	9-11

Chapter 10 Maintenance and Troubleshooting

Maintenance	10-1
Cleaning the scanner	10-1
Replacing the fluorescent lamp	10-2
Transporting the scanner	10-3
Upgrading from Windows 98 to Windows Me or 2000 . .	10-3
Problems and Solutions	10-8
Error indicator	10-9
Scanner operation problems	10-9

Software operation problems	10-12
Scanning problems.....	10-13
Quality problems	10-16
Color matching problems	10-18

Appendix A Contacting Customer Support

Overview	A-1
----------------	-----

Appendix B Technical Specifications

System Requirements	B-1
For PCs	B-1
For Macintosh computers	B-1
Scanning	B-2
Perfection 1250	B-2
Perfection 1650	B-3
Electrical	B-4
Perfection 1250	B-4
Perfection 1650	B-5
AC Adapter	B-6
Perfection 1250	B-6
Perfection 1650	B-7
Environmental	B-7
Standards and Approvals.....	B-8
Scanner.....	B-8
AC adapter	B-9
USB Interface	B-10
Perfection 1250	B-10
Perfection 1650	B-11
Initialization Methods.....	B-12
Integrated TPU for the Perfection 1650 Photo.....	B-12
Film Adapter (Option)	B-13
For the Perfection 1250.....	B-13
For the Perfection 1650.....	B-14

Introduction

About This Guide

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

- ❑ Chapter 1 introduces your scanner.
- ❑ Chapter 2 explains the basic steps of scanning. Read this chapter to learn how to scan images using EPSON TWAIN.
- ❑ Chapter 3 describes how to install and use the (optional) Film Adapter.
- ❑ Chapter 4 includes reference on settings and functions of the Manual mode.
- ❑ Chapter 5 explains how to use the Preview window in the Manual mode.
- ❑ Chapter 6 covers how to optimize the quality of scanned images.
- ❑ Chapter 7 provides information on how to customize the Manual mode setting.
- ❑ Chapter 8 covers how to use the buttons on the scanner.
- ❑ Chapter 9 introduces EPSON Smart Panel.
- ❑ Chapter 10 contains information on maintaining your scanner and troubleshooting scanner problems. If your software does not operate properly or scanned images are not what you expect, see this chapter.
- ❑ Appendix A covers customer support information.

- 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 *Setup Sheet*. EPSON TWAIN online help also provides you with information on modifying the EPSON TWAIN settings.

Where to Find Information

Setup Sheet

Describes how to set up the scanner. It explains how to install and configure the EPSON scanner software. It also covers how to open the *Online Reference Guide* and contains important safety instructions.

This Online Reference Guide

Provides basic information about scanning. It also includes detailed reference on settings and functions of EPSON TWAIN and other EPSON scanner utility software. You learn how to operate the buttons on the scanner and use the Film Adapter. Information is also available on maintenance, troubleshooting, technical specifications, and customer support.

Information on EPSON Scanner Software (online help)

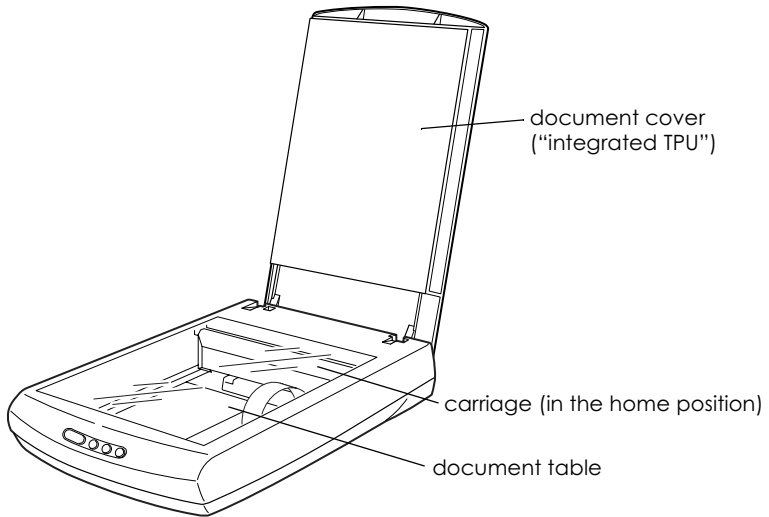
Provides you with detailed information on EPSON TWAIN. You can access the online help from the EPSON Scanner folder, or click the Help button in the EPSON TWAIN dialog box.

Information on other Software

Refer to the respective documentation for the information.

Getting to Know Your Scanner

Scanner Parts



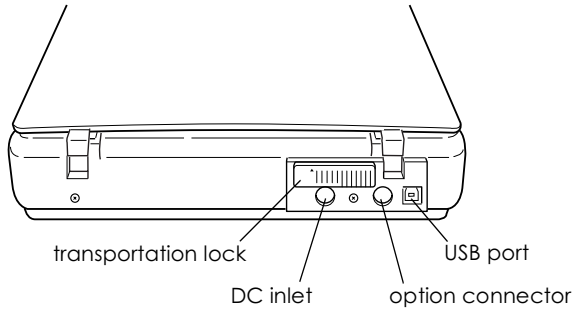
Note for Perfection 1250 and 1650 Photo users:

Most illustrations shown in this section are for the Perfection 1650, so they may be different in appearance from your scanner. The instructions are the same, except as noted.

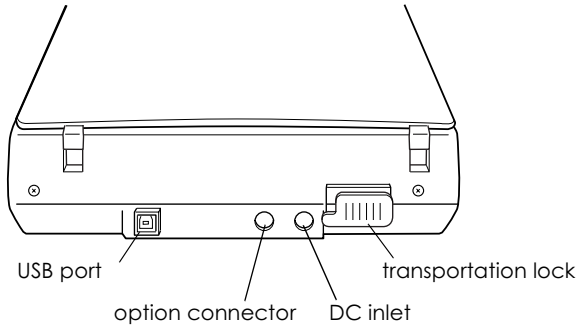
Note for Perfection 1650 Photo users:

Your scanner's document cover is the "integrated TPU" which has the same functions as the document cover and the Film Adapter. The reflective document mat is attached to the integrated TPU to control scanning. You can scan reflective documents when the reflective document mat is attached, or transparent materials (35-mm film strip and slides) when the reflective document mat is removed. See "Removing and attaching the reflective document mat" on page 3-9 for details.

Perfection 1250



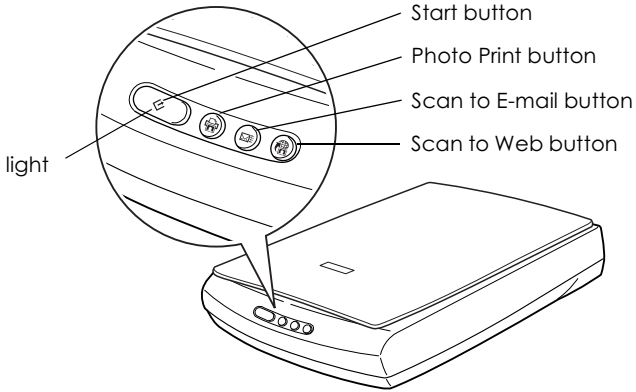
Perfection 1650



Light and Buttons

The scanner has one indicator light and four buttons. The indicator light is combined with the ↵ Start button that is semitransparent.

Light






Perfection 1250

Pattern	Color	Scanner Status
On	Green	Initializing or ready to scan images.
On	Red	An error has occurred. See "Error indicator" on page -9 for more information.
Off	(None)	The scanner is turned off.

Perfection 1650

Pattern	Color	Scanner Status
Flashing	Green	Initializing or busy scanning.
On	Green	Ready to scan images.
Flashing	Red	An error has occurred. See "Error indicator" on page -9 for more information.
Off	(None)	The scanner is turned off.

Buttons

Button	Function
◊ Start	Scans and sends the captured image to an assigned application in a single step. Before using this feature, make sure you have installed EPSON TWAIN and EPSON Smart Panel. See "Using the Start Button" on page 8-2 for more details.
 Photo Print	Scans and sends the captured image to Photo Print utility in EPSON Smart Panel. Before using this feature, make sure you have installed EPSON TWAIN and EPSON Smart Panel. See "Using the Photo Print Button" on page 8-3 for more details.
 Scan to E-mail	Scans and sends an e-mail message with the scanned image attached. Before using this feature, make sure you have installed EPSON TWAIN and EPSON Smart Panel. See "Using the Scan to E-mail button" on page 8-4 for more details.
 Scan to Web	Scans an image and uploads it to the EPSON photo-sharing site. Before using this feature, make sure you have installed EPSON TWAIN and EPSON Smart Panel. See "Using the Scan to Web Button" on page 8-7 for more details.

Scanning an Image

Overview

The basic scanning process using a TWAIN-compliant application involves the following procedures:

Scanning reflective documents

1. Place a document on the scanner. See “Placing a Document on the Scanner” on page 2-4 for details.
2. Start a TWAIN-compliant application. See “About TWAIN-compliant applications” on page 2-3 for details.
3. In the application, open EPSON TWAIN 5 using a command such as Acquire.
4. **Full Auto mode:**
EPSON TWAIN automatically previews the images, and recognizes the document source and type. Images are automatically optimized and scanned. See “Scanning from the Full Auto Mode” on page 2-8 for details.

Manual mode:

Make basic settings, optimize images manually and click **Scan**. See “Overview of the Manual Mode Window” on page 4-1 for details.

5. Save the scanned images. See “Saving a Scanned Image” on page 2-13 for details.

Scanning transparent materials

1. Install the Film Adapter if it is required. For Perfection 1250 users, see “Installing the Film Adapter” on page 3-2. For Perfection 1650 users, see “Installing the Film Adapter” on page 3-21 for details.
2. Load a slide or film into the film holder and set it with the Film Adapter. For Perfection 1250 users, see “Loading a film or a slide” on page 3-3. For Perfection 1650 Photo users, see “Loading a film or slides” on page 3-11. For Perfection 1650 users, see “Loading a film or slides” on page 3-24.
3. Start a TWAIN-compliant application. See “About TWAIN-compliant applications” on page 2-3 for details.
4. In the application, open EPSON TWAIN 5 using a command such as Acquire.
5. **Full Auto mode:**
EPSON TWAIN automatically previews the images, and recognizes the document source and type. Images are automatically optimized and scanned. See “Scanning from the Full Auto Mode” on page 2-8 for details.

Manual mode:
Make basic settings, optimize images manually and click Scan. See “Thumbnail Preview” on page 5-8 for details.
6. Save the scanned images. See “Saving a Scanned Image” on page 2-13 for details.

About TWAIN

About TWAIN-compliant applications

This scanner is a TWAIN-compliant device. You can scan images using a TWAIN-compliant image processing application.

The following TWAIN-compliant image processing applications are included in your scanner package. Use one appropriate for your purpose.

- EPSON Smart Panel
- ArcSoft PhotoImpression™
(for Perfection 1250/1250 Photo/1650 users)
- Adobe® Photoshop® Elements
(for Perfection 1650 Photo users)

You can also scan images using common TWAIN-compliant applications such as Imaging for Windows®.

TWAIN

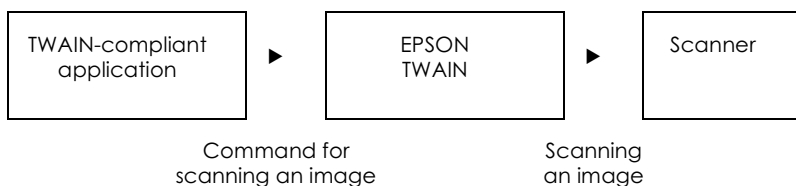
TWAIN is a standard for the application program interface (API) between image input devices (such as scanners) and applications which control the image input devices.

Using a TWAIN-compliant application and a TWAIN-compliant scanner with a TWAIN-compliant driver enables the users to operate any scanner in the same manner.

About EPSON TWAIN

Your scanner is controlled by your computer via a driver called “EPSON TWAIN” (TWAIN-compliant driver).

While in a TWAIN-compliant application, when you select a scan command to scan an image, the command activates EPSON TWAIN to scan the image according to the specified settings.



While the TWAIN-compliant application may appear to be controlling your scanner in the scanning process, it is EPSON TWAIN which is actually doing the job.

You can use the EPSON TWAIN screen to specify various settings for scanning.

Note:

You can operate EPSON TWAIN in the same way on both Windows and Macintosh. This guide explains the operation procedure using the Windows examples.

Placing a Document on the Scanner

Before scanning a document, remember to respect the rights of copyright owners. Do not scan published text or images without first checking the copyright status.



Caution:

Do not place heavy objects on the glass of the document table. Also, do not press the glass of the document table with too much force.

1. Place the scanner on a flat, stable surface.
2. Plug in the scanner.

3. Turn on the computer and make sure that the scanner's indicator light stays on in green.
4. Open the document cover and make sure the fluorescent lamp on the carriage turns on.

Note for Perfection 1250 users:

The fluorescent lamp turns off if you unplug the USB cable, and turns on again if you connect the USB cable.

Note for Perfection 1650 users:

The fluorescent lamp turns off if no command arrives from the computer within 15 minutes. This is normal and the lamp turns back on once you start scanning.

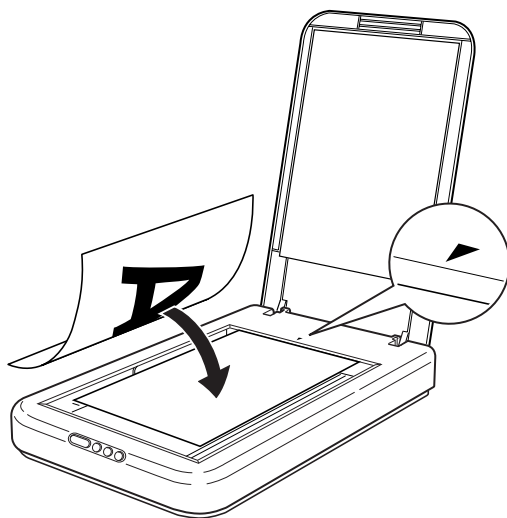
Note for Perfection 1650 Photo users:

Make sure the reflective document mat is attached to the integrated TPU. See "Removing and attaching the reflective document mat" on page 3-9.

5. Place the document on the document table, with the side to be scanned facing down. Make sure that the document is carefully aligned to the Alignment Mark as shown below.

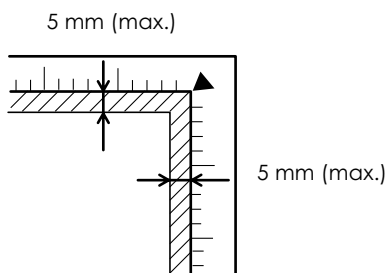
For Perfection 1250 users

Align the center of the document with the Alignment Mark.



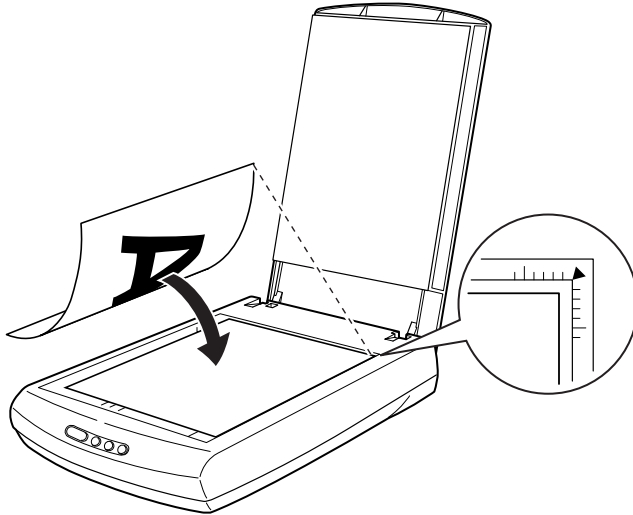
Note for Perfection 1250 users:

The area with a width of maximum 5 mm from both the horizontal and vertical guides is not scanned.

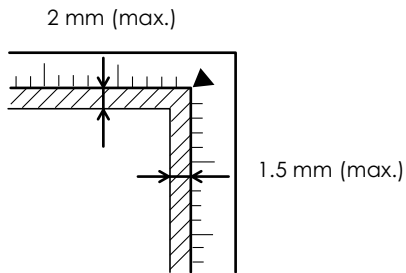


For Perfection 1650 users

Note for Perfection 1650 users:



An area maximum 2 mm from the horizontal and 1.5 mm from the vertical edges of the document table glass will not be scanned.



6. Close the document cover gently so that the document does not move.

Note:

- ❑ Always keep the document table clean. See “Cleaning the scanner” on page 10-1 for instructions.
- ❑ Do not leave photographs on the document table for an extended period of time as they may stick to the glass.

- ❑ *Do not place heavy objects on top of the scanner.*
- ❑ *For a thick or large document, you can remove the document cover to make it easier to align the document. See “Removing the document cover” on page 3-18 or “Removing the integrated TPU (for Perfection 1650 Photo users)” on page 3-19.*
- ❑ *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.*

Scanning from the Full Auto Mode

In the Full Auto mode, an image is automatically optimized. You can scan quickly and easily without changing any complex settings in the Full Auto mode.

Follow the steps below to scan reflective documents or transparent materials from the Full Auto mode.

Note:

- ❑ *In the Full Auto mode, you can scan transparent materials in color (color films). If you want to scan monochrome negative film, switch to the Manual mode.*
- ❑ *Be sure to use the film holders when you scan transparent materials in the Full Auto mode. For Perfection 1250 users, see “Loading a film or a slide” on page 3-3. For Perfection 1650 Photo users, see “Loading a film or slides” on page 3-11. For Perfection 1650 users, see “Loading a film or slides” on page 3-24.*

Note for Macintosh users:

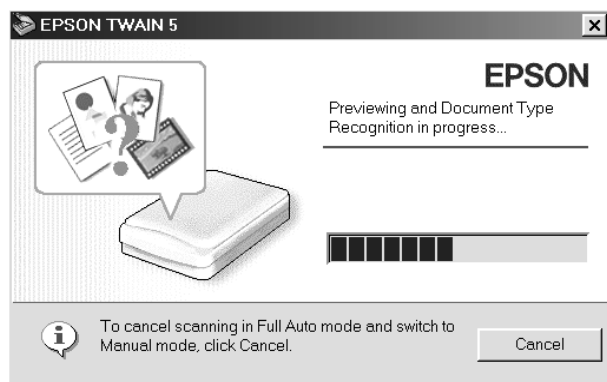
Most illustrations shown in this section are for Windows, so they may vary in appearance from what actually appears on your screen. The instructions are the same, except as noted.

1. Start the TWAIN-compliant application. (The example used here is ArcSoft PhotoImpression.)

2. Click the Get Photo button and then click the Camera/Scanner button on the main screen.
3. Choose EPSON TWAIN 5 from the Select Source list and click the Acquire button (for Windows users) or the OK button (for Macintosh users) to open EPSON TWAIN.

Note:

- You usually need to choose EPSON TWAIN 5 only the first time you use the scanner with your application.
 - For detailed settings, refer to your application's documentation.
4. The following window appears.



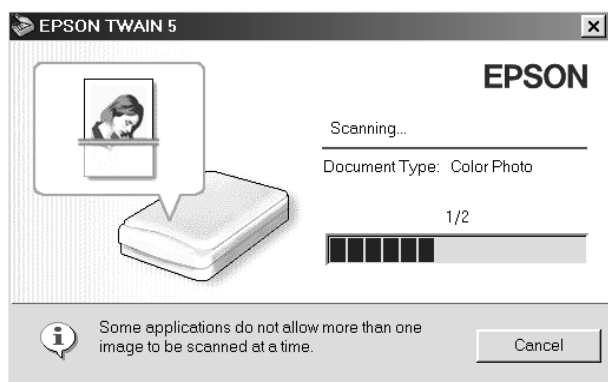
EPSON TWAIN automatically previews the image, and recognizes the document source and type. See “Document Type Recognition setting” on page 2-11.

If you want to make more settings, click **Cancel** and then click the **>>** button (for Windows users) or the arrow on the bottom left corner of the window (for Macintosh users) to open the customizing menu for the Full Auto mode. See “Customizing the Full Auto Mode Settings” on page 2-14 for more details.

If you want to switch to the Manual mode, click Cancel and then click the Manual mode button to open the Manual mode window. For information on the Manual mode, see “Overview of the Manual Mode Window” on page 4-1 for details.

Note:

- Depending on the image you want to scan, you may not get the expected scanned image. In this case, scan the image in the Manual mode.
 - You cannot click Cancel when the scanner is warming up.
5. After EPSON TWAIN has previewed and recognized the document type, the following window appears. You can see the document type and the icon in the window.



EPSON TWAIN automatically sets the “Image Location setting” on page 2-12 and “Exposure setting” on page 2-13, and then starts scanning. If you scan multiple photos, the number of scanned image will be indicated.

To cancel the scanning, click Cancel.

6. The scanned image is sent to the application.

Note:

- ❑ *Depending on the application, you may not be able to scan multiple images.*
- ❑ *If you cannot scan transparent materials from the Full Auto mode, switch to the Manual mode and use the marquee. See “You cannot scan the film from the Full Auto mode or the Thumbnail preview.” on page -15 for details.*
- ❑ *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.*
- ❑ *For information on further editing of the scanned images, refer to your application's documentation.*
- ❑ *After an image is scanned, be sure to save or export it.*
- ❑ *The mode you finish the last time opens the next time you start EPSON TWAIN.*

Document Type Recognition setting

The image is automatically recognized as one of the following document type:

Document Source	Document Type	Icon
------------------------	----------------------	-------------






Reflective	Color Photo	
	Black & White Photo	
	Illustration	
	Text/Line Art	
	Color Document	
	Black & White Document	
Film	Color Negative Film	
	Color Positive Film	

Image Location setting

Auto Locate:

The scanner automatically locates and selects the target image. The image appears without white borders. (If the document type is document or Text/Line Art, a 2 mm margin is added around all edges of the location.) If the document type is photo or film, Auto Locate applies to each photo; otherwise it covers the whole area of the image.

Detect Skew Angle: The scanner automatically detects the skew of the target image. If the document type is photo or film, Detect Skew Angle applies to each photo. If the document type is Text/Line Art, it covers the whole area of the image.

Exposure setting

The scanner automatically optimizes the exposure of an image defined by Auto Locate. The Gamma, Highlight, and Shadow settings are automatically set.

Saving a Scanned Image

After an image is scanned, be sure to save it, using the steps below. (The example used here is ArcSoft PhotoImpression.)

1. Click the **Save** button on the main screen.
2. Click the **Save As** button.
3. Type a file name, select a file format, and then click **Save**. See the following section for the file formats.

File formats

The following table lists some common image file formats. Select an appropriate format supported by your image processing application when you save image files.


Format (File extension)	Explanation
BMP format (*.BMP)	Standard image file format in Windows. Most Windows applications including word processor applications can read and prepare images in this format.

TIFF format (*.TIF)	TIFF is a file format which is designed for data exchange between applications such as graphics software and DTP software.
JPEG format (*.JPG)	JPEG is a compressed file, which allows a choice in compression quality. However, if the compression is too high, the image quality deteriorates. The image quality also deteriorates every time the image file is saved in JPEG. If you edit an image file after saving it, the original image should be preserved in a file format other than JPEG.
EPS format (*.EPS)	EPS is a PostScript file format. Most illustration and DTP applications are compatible with EPS.
PICT format (Macintosh only)	PICT is a standard image file format for Macintosh. Most Macintosh applications including word processor software can read and prepare images in this format.

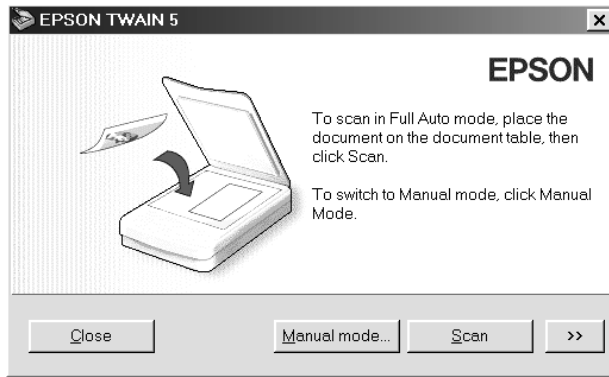
Customizing the Full Auto Mode Settings

You can change the Full Auto mode settings as described below.

Note:


If the resolution is specified by the application, such as Scan to E-mail and Scan to Web in EPSON Smart Panel, the customizing menu is automatically disabled. In this case, the  button appears dimmed (for Windows users) or the arrow on the bottom left corner of the window does not appear at all (for Macintosh users).

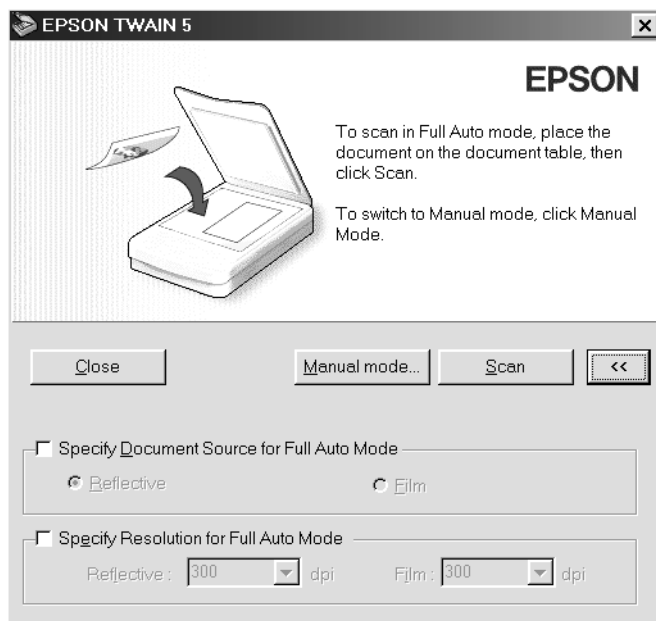
1. Click Cancel during the preview and the document type recognition. The following window appears.



Note:

Click Close to close the window. Click the Manual mode button to switch to the Manual mode. Click Scan to scan an image in the Full Auto mode.

- Click the  button (for Windows users) or the arrow on the bottom left corner of the window (for Macintosh users). The customizing menu for the Full Auto mode appears.



To specify a document source, select the Specify Document Source for Full Auto Mode check box and then select a document source. Only the selected document source is recognized in the Full Auto mode. This reduces the document type recognition error and the number of warm-up, and makes preview scanning faster.

To change the resolution, select the Specify Resolution for Full Auto Mode check box and select a resolution. This overrides the predefined settings. See the following table for the predefined settings.

Document Source	Document Type	Resolution
-----------------	---------------	------------

Reflective	Color Photo	300 dpi
	Black & White Photo	300 dpi
	Illustration	150 dpi
	Text/Line Art	300 dpi
	Color Document	150 dpi
	Black & White Document	150 dpi
Film	Color Negative Film	300 dpi
	Color Positive Film	300 dpi

Chapter 3

Using the Film Adapter

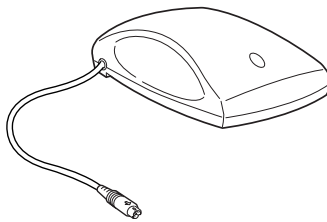
For Perfection 1250 Users

The Film Adapter (B81332*) enables you to scan of negative film strips and slides simply by installing the unit on your scanner. The Film Adapter is compact so it can be attached or removed easily when you alternate scanning between transparent materials and normal reflective (paper) documents.

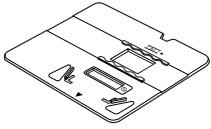
Unpacking the Film Adapter

When you first open the package, make sure that all the following items are included. If any items are missing or damaged, contact your EPSON dealer immediately. Do not throw away the package after unpacking the Film Adapter as it can be used again for storage when you are not scanning transparencies.

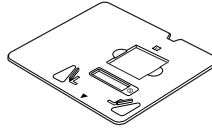
Film Adapter



Film holders



35-mm film strip

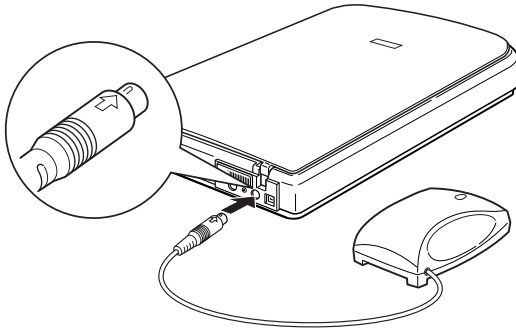


35-mm slide

Installing the Film Adapter

Follow the steps below to install the (optional) Film Adapter on the scanner.

1. Make sure the scanner is unplugged and turned off.
2. Connect the Film Adapter connector to the scanner's option connector.



3. Plug in the scanner.

Loading a film or a slide

By attaching the Film Adapter, you can scan transparent materials such as positive or negative film, by passing light through the material. The following sections explain how to scan transparent materials.

You can scan a 35-mm film strip or slide.

Note:

- ❑ *If you plan to scan transparent materials from the EPSON Smart Panel application, refer to the EPSON Smart Panel documentation for details.*
- ❑ *If you plan to scan transparent materials from EPSON Photo Print utility, refer to the EPSON Photo Print documentation for details.*
- ❑ *Wipe the inside of the Film Adapter and the scanner's document table before scanning transparencies.*

Follow the steps below to load a film or a slide.

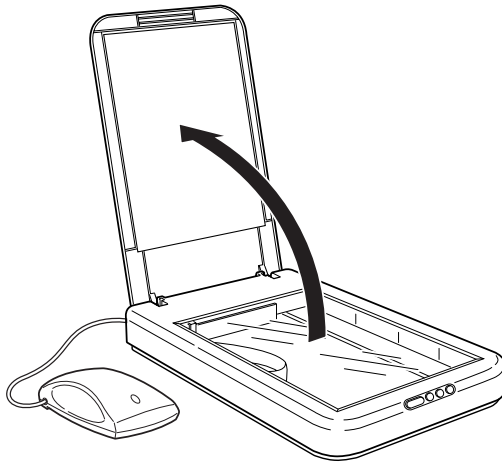


Caution:

Hold the film at the edges, or else use gloves. Touching the film surface with bare hands can leave fingerprints or other traces on the film.

1. Make sure the cable for the Film Adapter is connected to the scanner's option connector.

2. Open the document cover.



3. Load your transparencies into the film holders and position them on the scanner's document table. Go to the section listed below that matches the type of transparency you want to scan.

"35-mm film strip" on page 3-5

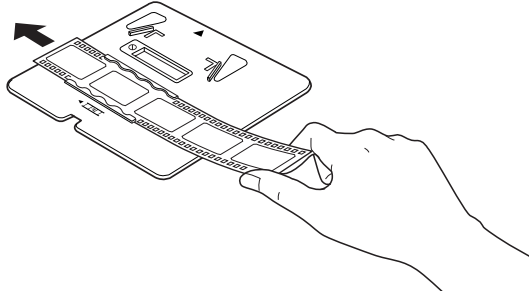
"35-mm slide" on page 3-6

Note:

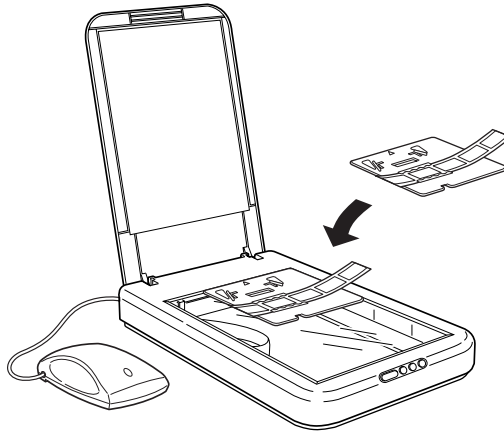
- ❑ *The base side of the film is the side which the film maker's name and film ID numbers are shown.*
- ❑ *Align the up-down direction of the film with the illustration (the mirror writing of the alphabet "F") printed on the film folder.*

35-mm film strip

Insert a strip of film in the 35-mm film strip holder, base side facing down. Slide the strip until all of the frame you wish to scan is positioned inside the film holder opening.

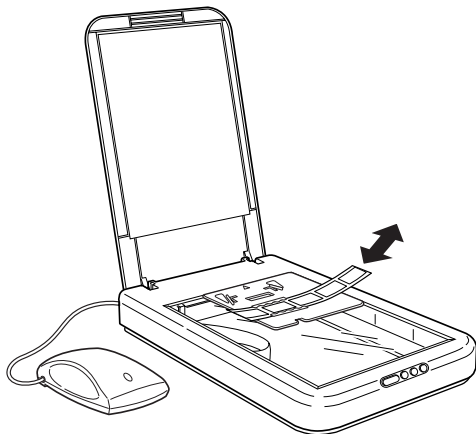


Place the film holder on the document table in alignment with the upper right-hand corner of the document table.



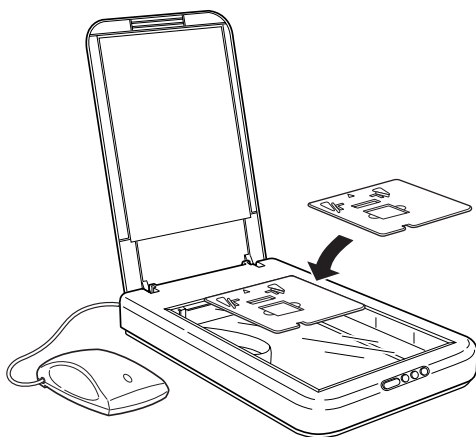
Note:

You can move and adjust the position of 35-mm film by sliding the strips in the film holder so the frames you want to scan are positioned in the film holder opening.

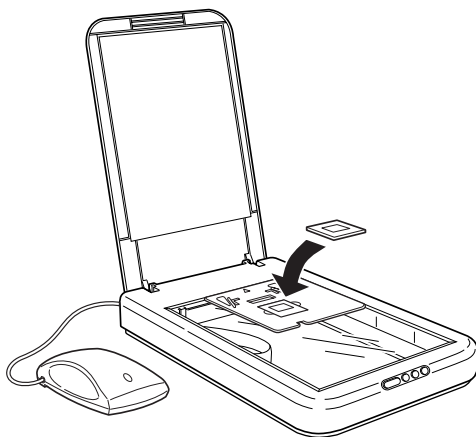


35-mm slide

Place the 35-mm slide holder on the document table in alignment with the upper right-hand corner of the document table.

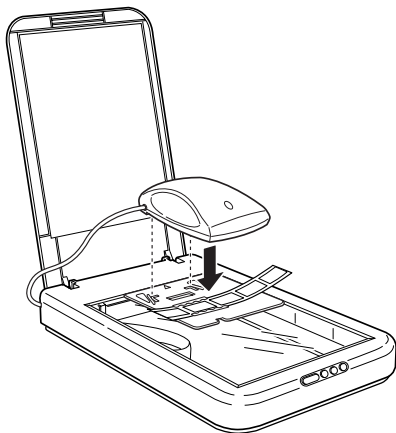


Place a slide in the 35-mm slide holder, as shown below.

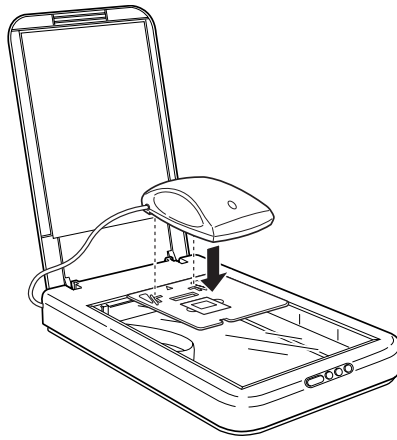


4. Put the Film Adapter on the film folder as shown below.

35-mm film strip



35-mm slide



For instructions on scanning transparent materials in the Full Auto mode, see “Scanning from the Full Auto Mode” on page 2-8. For instructions on scanning transparent materials in the Manual mode, see “Thumbnail Preview” on page 5-8.

Note:

- ❑ *Make sure the Film Adapter is completely fitted in the film holder; otherwise you cannot obtain proper colored images.*
- ❑ *You need to select TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film in the Document Source settings in the Manual mode window depending on the type of film (negative or positive) you are scanning. The scanner software automatically controls the operation of the Film Adapter.*
- ❑ *To remove a film holder from the document table, slide it left or right then take it out of the table.*

Scanning normal (reflective) documents

When you return to scanning normal reflective documents, you can simply remove the Film Adapter and the film holder.

Remove the Film Adapter in reverse order as described on “Installing the Film Adapter” on page 3-2.

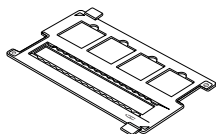
For Perfection 1650 Photo Users

Your scanner's “integrated TPU” functions both as the document cover and the Film Adapter. You can scan negative film strips and slides simply by removing the reflective document mat.

Unpacking

When you first open the package, make sure that all the following items are included. If any items are missing or damaged, contact your EPSON dealer immediately.

Film holder



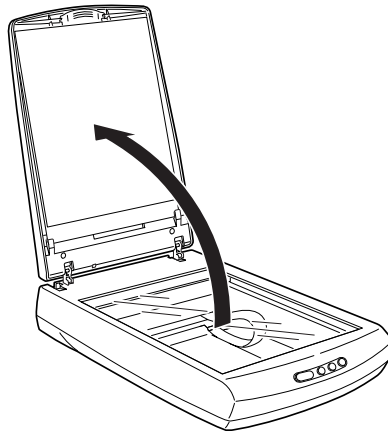
35-mm film strip and slides

Removing and attaching the reflective document mat

The reflective document mat is attached to the integrated TPU. Follow the steps below to remove and attach the reflective document mat.

Removing the reflective document mat

1. Open the integrated TPU.



2. Hold the top of the reflective document mat and then slide it up gently.

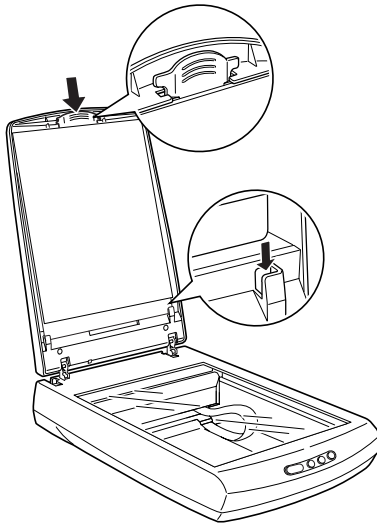


Note:

You need to remove the reflective document mat when you scan transparent materials.

Attaching the reflective document mat

1. Open the integrated TPU.
2. Hold the top of the reflective document mat and slide it down gently along the integrated TPU.
3. Adjust both bottom corners of the reflective document mat to the holes (position fittings) of the integrated TPU. Make sure the top of the reflective document mat is inserted in the hook of the integrated TPU.



Note:

You need to attach the reflective document mat when you scan reflective documents.

Loading a film or slides

You can scan transparent materials such as positive or negative film, by passing light through the material. The following sections explain how to scan transparent materials.

You can scan a 35-mm film strip or slides.

Note:

- ❑ *If you plan to scan transparent materials from the EPSON Smart Panel application, refer to the EPSON Smart Panel documentation for details.*
- ❑ *If you plan to scan transparent materials from EPSON Photo Print utility, refer to the EPSON Photo Print documentation for details.*
- ❑ *Wipe the inside of the integrated TPU and the scanner's document table before scanning transparencies.*

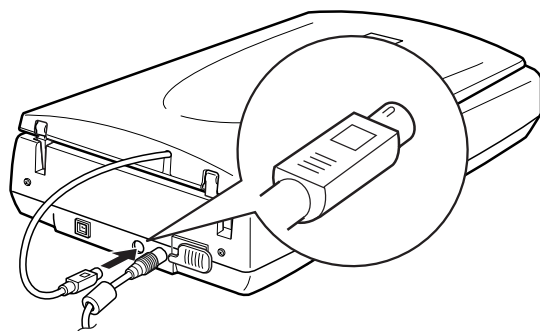
Follow the steps below to load a film or slides.



Caution:

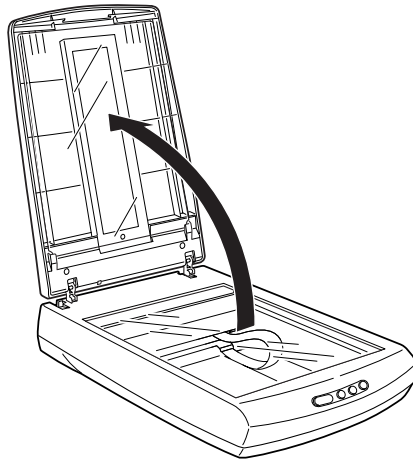
Hold the film at the edges, or else use gloves. Touching the film surface with bare hands can leave fingerprints or other traces on the film.

1. Make sure the scanner is unplugged and turned off.
2. Connect the integrated TPU connector to the scanner's option connector.



3. Plug in the scanner.

4. Open the integrated TPU.



5. Make sure the reflective document mat is removed. See “Removing and attaching the reflective document mat” on page 3-9 for details.
6. Load your transparencies into the film holder and position it on the scanner’s document table. Go to the section listed below that matches the type of transparency you want to scan.

“35-mm film strip” on page 3-14

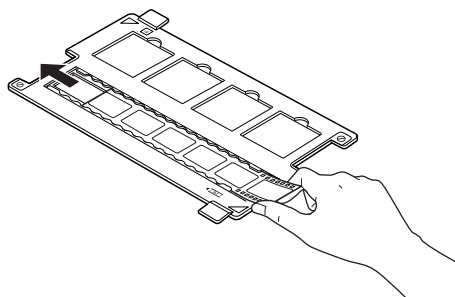
“35-mm slides” on page 3-15

Note:

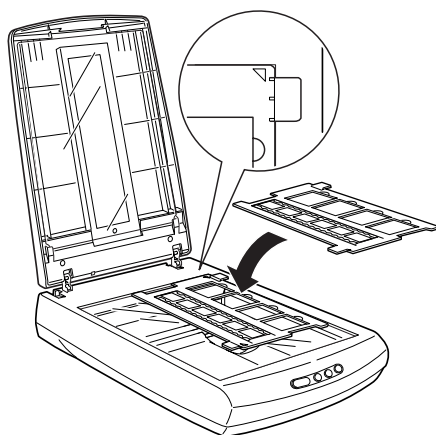
- The base side of the film is the side which the film maker’s name and film ID numbers are shown.*
- Align the up-down direction of the film with the illustration (the mirror writing of the alphabet “F”) printed on the film folder.*

35-mm film strip

Insert a strip of film in the film strip holder, base side facing down.

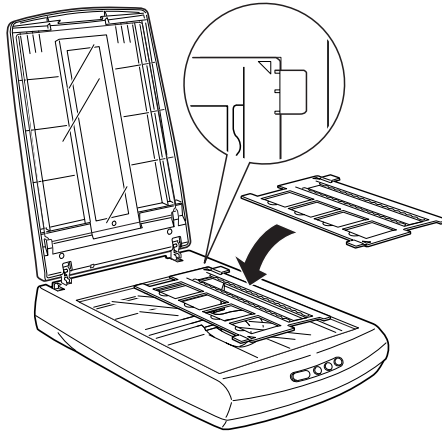


Place the film holder on the document table in alignment with the upper right-hand corner of the document table.

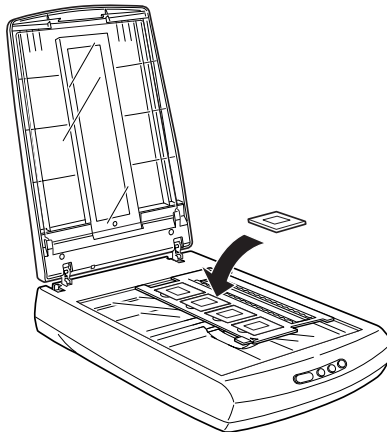


35-mm slides

Place the film holder on the document table in alignment with the upper right-hand corner of the document table.



Place slides in the 35-mm slide holder, as shown below.



7. Close the integrated TPU.

For instructions on scanning transparent materials in the Full Auto mode, see “Scanning from the Full Auto Mode” on page 2-8. For instructions on scanning transparent materials in the Manual mode, see “Thumbnail Preview” on page 5-8.

Note:

- ❑ *Make sure the integrated TPU is completely closed; otherwise you cannot obtain proper colored images.*
- ❑ *You need to select TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film in the Document Source settings in the Manual mode window depending on the type of film (negative or positive) you are scanning. The scanner software automatically controls the operation of the integrated TPU.*
- ❑ *To remove a film holder from the document table, slide it left or right then take it out of the table.*

Scanning normal (reflective) documents

When you return to scanning normal reflective documents, you can simply attach the reflective document mat. See “Attaching the reflective document mat” on page 3-11.

Note:

When you return to scanning reflective documents in the Manual mode, you need to set the Document Source to Flatbed in the Manual mode window.

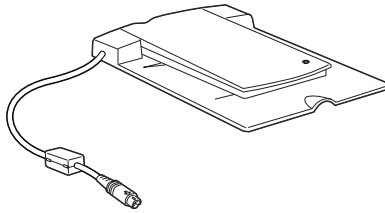
For Perfection 1650 Users

The optional Film Adapter (B81317*) enables you to scan of negative film strips and slides simply by installing the unit on your scanner. The Film Adapter is compact so it can be attached or removed easily when you alternate scanning between transparent materials and normal reflective (paper) documents.

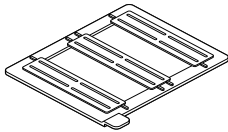
Unpacking the Film Adapter

When you first open the package, make sure that all the following items are included. If any items are missing or damaged, contact your EPSON dealer immediately. Do not throw away the package after unpacking the Film Adapter as it can be used again for storage when you are not scanning transparencies.

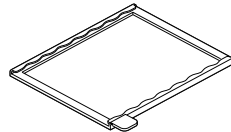
Film Adapter



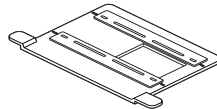
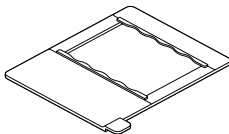
Film holders



35-mm film strip
(multiple frames)



4 x 5 inch film



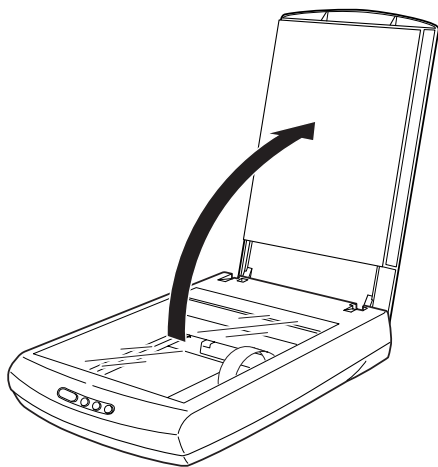
120/220
(6 cm × 9 cm film)

35-mm film strip
(single frame)
Note: Not supported by the
Perfection 1650 or the
Perfection 1650 Photo.

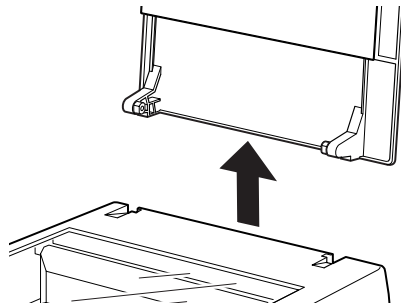
Removing the document cover

Follow the steps below to remove the document cover.

1. Open the document cover.

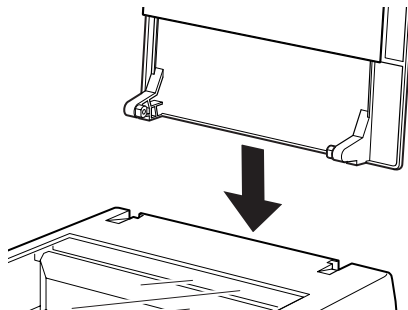


2. Pull the cover straight up.



Note:

When you are finished scanning, reattach the document cover in the reverse order that you removed it.

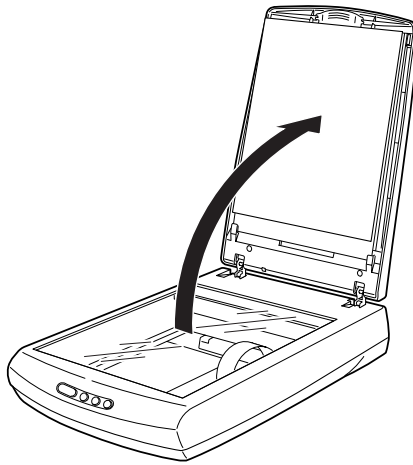


Removing the integrated TPU (for Perfection 1650 Photo users)

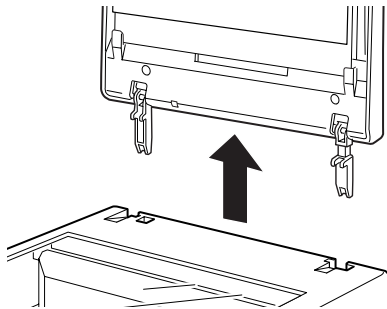
Follow the steps below to remove the integrated TPU.

1. Make sure the scanner is unplugged.
2. Disconnect the cable for the integrated TPU from the scanner's option connector.

3. Open the integrated TPU.

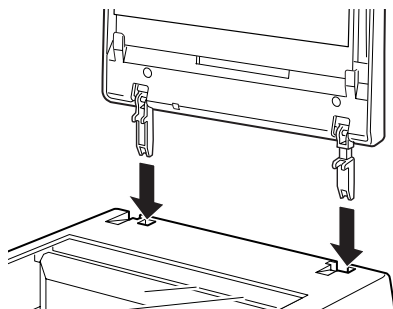


4. Pull the integrated TPU straight up.



Note:

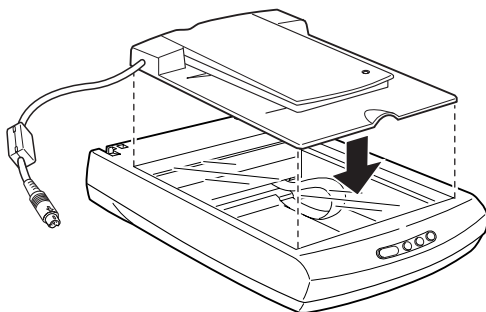
When you are finished scanning, reattach the integrated TPU in the reverse order that you removed it.



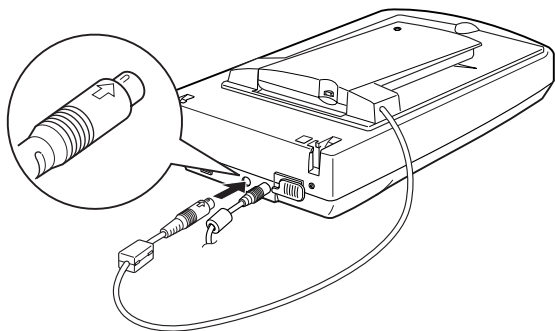
Installing the Film Adapter

Follow the steps below to install the optional Film Adapter on the scanner.

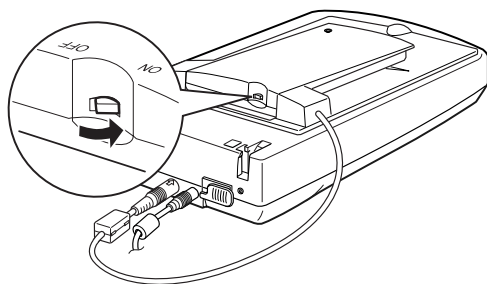
1. Make sure the scanner is unplugged and turned off.
2. Remove the document cover or the integrated TPU. See “Removing the document cover” on page 3-18 or “Removing the integrated TPU (for Perfection 1650 Photo users)” on page 3-19 for details.
3. Place the optional Film Adapter on the document table so that the hinges face the rear of the scanner and it fits on the table.



4. Connect the Film Adapter connector to the scanner's option connector.



5. Plug in the scanner.
6. Turn on the Film Adapter.



Film holders

By attaching the Film Adapter, you can scan transparent materials such as positive or negative film, by passing light through the material. The following sections explain how to scan transparent materials.

Four film holders are included with this unit. To scan film, see the instructions below.



Caution:

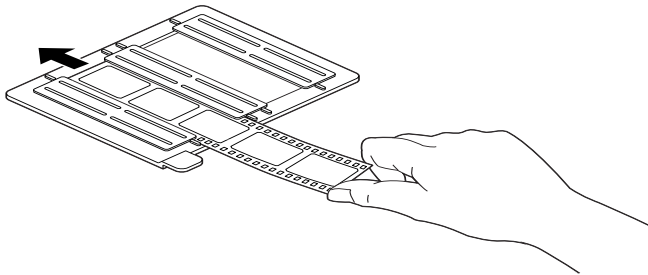
Hold the film at the edges, or else use gloves. Touching the film surface with bare hands can leave fingerprints or other traces on the film.

Note:

- ❑ *If you plan to scan transparent materials from the EPSON Smart Panel application, refer to the EPSON Smart Panel documentation for details.*
- ❑ *If you plan to scan transparent materials from EPSON Photo Print utility, refer to the EPSON Photo Print documentation for details.*
- ❑ *The base side of the film is the side which the film maker's name and film ID numbers are shown.*

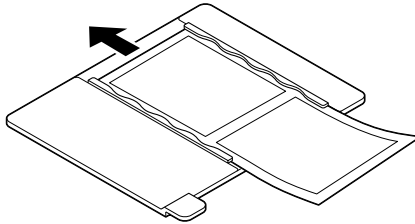
35-mm film strip (multiple frames)

Insert a strip of film in the 35-mm film strip holder for multiple frames, base side facing down.



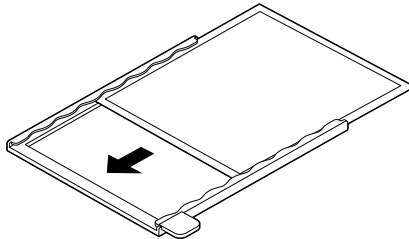
120/220 (6 cm x 9 cm) film

Insert film in the 120/220 (6 cm × 9 cm) size film holder, base side facing down.



4 x 5 inch film

Insert film in the 4 × 5 inch film holder, base side facing down.



Loading a film or slides

You can scan slides and film strip in the 4 × 5 inch (101.6 × 127 mm) scanning area of the Film Adapter.

Note:

- ❑ *Wipe the inside of the Film Adapter cover, the scanner's document table, and the narrow window near the hinges before scanning transparencies.*

- ❑ *You need to select TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film in the Document Source settings in the Manual mode window depending on the type of film (negative or positive) you are scanning. The scanner software automatically controls the operation of the Film Adapter.*

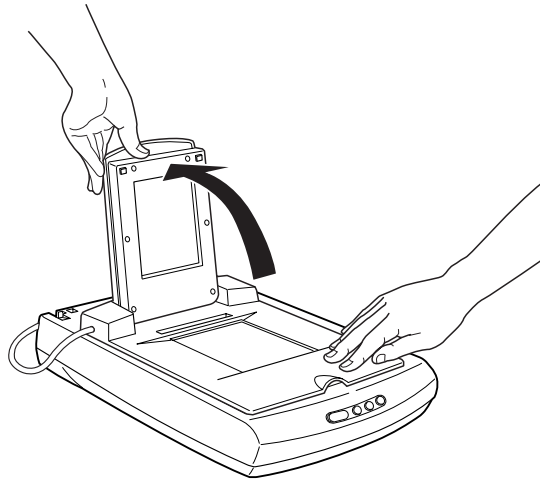
Follow the steps below to load film or slides.



Caution:

Hold the film at the edges, or else use gloves. Touching the film surface with bare hands can leave fingerprints or other traces on the film.

1. Open the top of the Film Adapter, holding the base down.



2. Load the transparency to be scanned face down on the scanner's document table in the window of the Film Adapter as shown below.

“Loading a 35-mm film strip (multiple frames)” on page 3-26

“Loading 120/220 (6 cm x 9 cm) film” on page 3-27

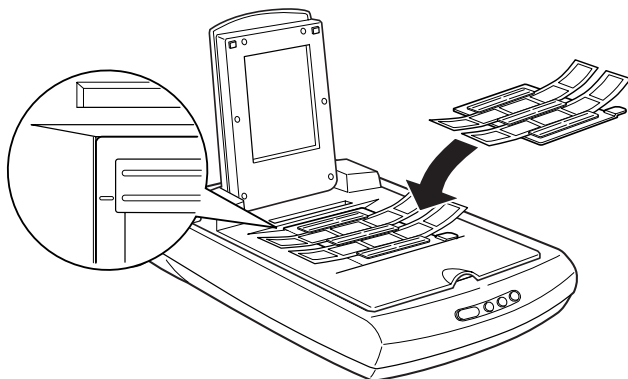
“Loading 4 x 5 inch film” on page 3-27

“Loading a slide” on page 3-28

“Loading slides” on page 3-28

Loading a 35-mm film strip (multiple frames)

If you are scanning a 35-mm film strip with multiple frames, use the 35-mm film strip holder for multiple frames to set the film strip.

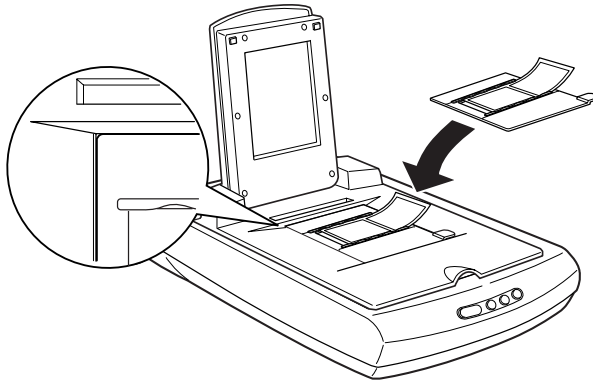


Note:

Place the film holder on the document table in alignment with the upper left-hand corner of the Film Adapter.

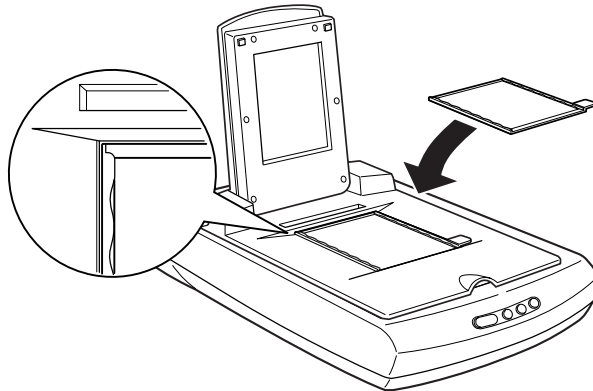
Loading 120/220 (6 cm x 9 cm) film

When scanning 120/220 (6 cm x 9 cm) or similar film, use the film holder as shown below.



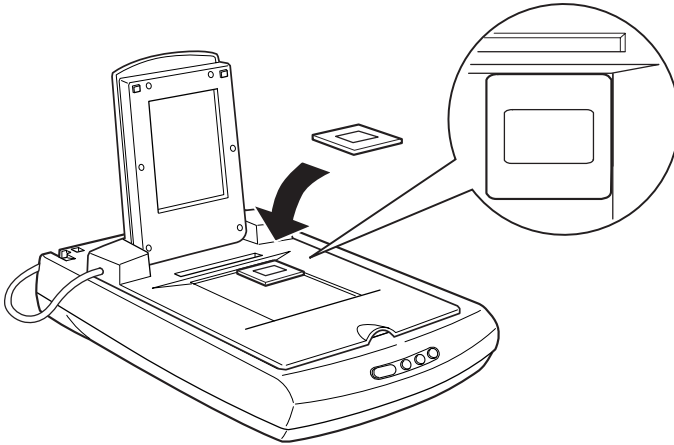
Loading 4 x 5 inch film

If the film size is 4" x 5" or similar, use the film holder as shown below.



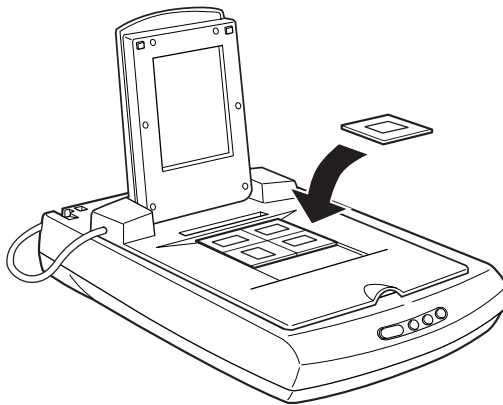
Loading a slide

When scanning a slide, place it directly on the document table and align it with the top right corner of the Film Adapter.



Loading slides

When scanning multiple slides or transparencies which will not fit in a film holder, place them directly on the document table. For multiple slides, make sure each slide is placed right after the previous one with no space between them.



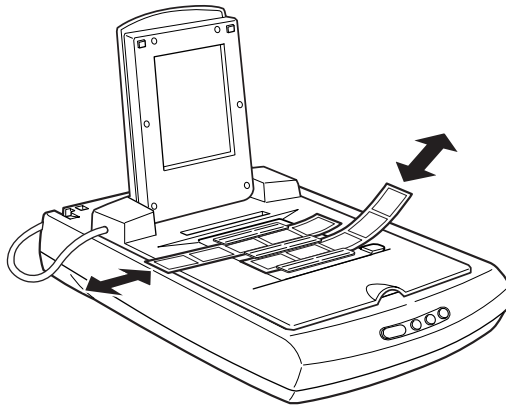
Note:

If multiple slides are scanned and then displayed in the Thumbnail preview, the sequence of the thumbnail images does not follow the actual order of the scanned slides. The sequence of the thumbnail images starts from the top right image and runs vertically. See “Thumbnail Preview” on page 5-8.

3. Close the unit.

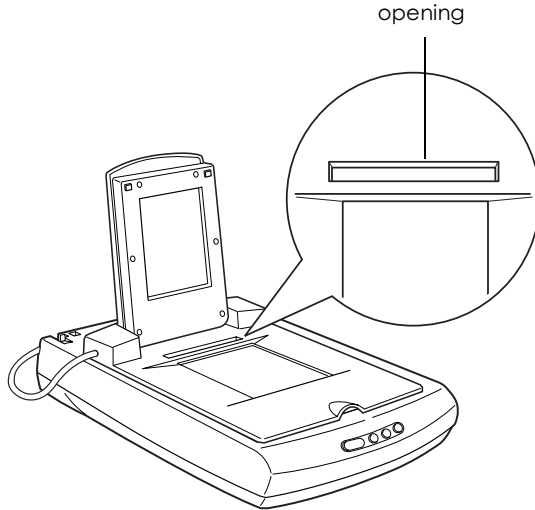
Note:

- ❑ *Make sure the unit is completely closed; otherwise you cannot obtain proper colored images.*
- ❑ *You can move and adjust the position of 35-mm film by sliding the strips in the film holder so the frames you want to scan are positioned in the window.*



- ❑ *To remove a film holder from the document table, slide it left or right then take it out of the window.*
- ❑ *Leave the opening shown below uncovered, otherwise the colors in your scans will be affected.*

Scanning normal (reflective) documents



When you return to scanning normal reflective documents, you can simply turn off the Film Adapter, then place documents between it and the document table. If you will not scan transparencies for a long time, you can remove the Film Adapter and store it in the original package.

Remove the Film Adapter in reverse order as described on “Installing the Film Adapter” on page 3-21.



Caution:

When you remove the Film Adapter, be sure to turn off the Film Adapter first.

Note:

- *When scanning thin documents, you may see an impression of the underside of the Film Adapter in your scans. If so, change to using the document cover or the integrated TPU instead of the optional Film Adapter.*

- ❑ *When you use EPSON Smart Panel to scan and print reflective documents, such as photos, first remove the optional Film Adapter and replace the document cover or the integrated TPU.*

Note for Perfection 1650 Photo users:

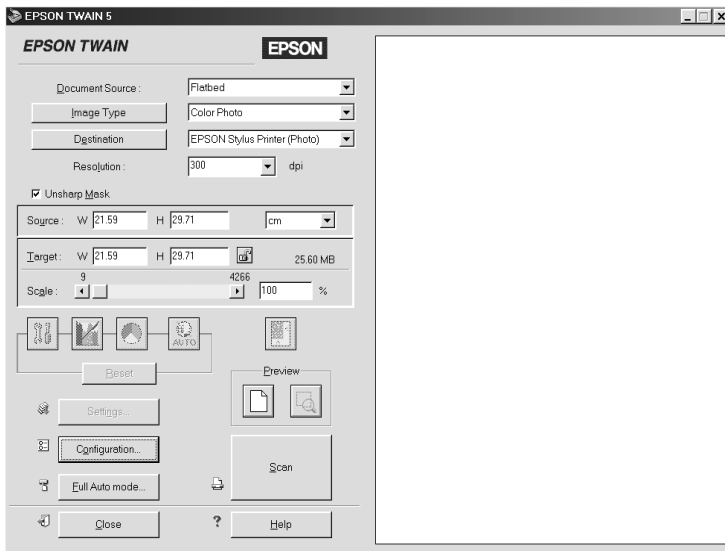
Make sure the reflective document mat is attached to the integrated TPU when you scan reflective documents.

Chapter 4

Scanning from the Manual Mode





Overview of the Manual Mode Window





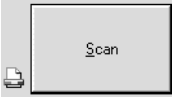

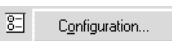


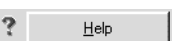
In the Manual mode, there are many more options available to give you greater control over your scanning. You can sharpen, correct, enhance or preview your images before scanning them in the Manual mode.



The Manual mode window consists of the following parts and buttons. See the table below to identify the each part's name and function.

Button	Name	Function
--------	------	----------

-	Document Source	Select a document source. See "Selecting a Document Source" on page 4-4.
-	Image Type	Select the type of image to be scanned. See "Selecting an Image Type" on page 4-5.
-	Destination	Select a destination, or output device. See "Selecting a Destination" on page 4-13.
-	Resolution	Set the resolution. See "Selecting the Resolution" on page 4-16.
-	Unsharp Mask	Improves image sharpness. See "Selecting the Unsharp Mask" on page 5-13.
-	Source field	Indicates the size of the image displayed or selected in the Preview window. See "Specifying Source and Target Image Sizes" on page 5-14.
-	Target field	Indicates size of the image when output. See "Specifying Source and Target Image Sizes" on page 5-14.
	Image Controls button	Optimize the image. See "Adjusting Brightness and Contrast" on page 6-2.
	Tone Correction button	Optimize the image. See "Applying a preset tone curve" on page 6-6.
	Color Adjustment button	Optimize the image. See "Adjusting Color" on page 6-11.
	Auto Exposure button	Automatically optimize the exposure for an image. See "Using the Auto Exposure Button" on page 5-17.

	Reset button	Return image control settings you modified back to their default settings. See "Using the Reset Button" on page 6-17.
	Auto Locate button	Command the scanner to automatically locate and select the target image. See "Using the Auto Locate button" on page 5-7.
	Full Preview button	Preview the image. See "Overview of the Preview Window" on page 5-1.
	Zoom Preview button	Preview a part of the image already in the Preview window. See "Using the Zoom Preview button" on page 5-5.
	Scan button	Scans the image or the active marquee in the Preview window. See "Using the Scan Button" on page 4-17.
	Settings button	View all the settings for the currently previewed image. See "Using the Settings Dialog Box" on page 7-1.
	Configuration button	Make settings which affect the Preview window. See "Making Configuration Settings" on page 7-2.
	Full Auto mode button	Switch to the Full Auto mode. See "Scanning from the Full Auto Mode" on page 2-8.
	Close button	Close the Manual mode window.
	Help button	Access the online help.

Note:

- ❑ *If some settings appear dimmed or are not displayed in the Manual mode, they cannot be selected because of your scanner type or your choice of other settings.*

❑ For details about each TWAIN setting, refer to the online help.

Note for Macintosh users:

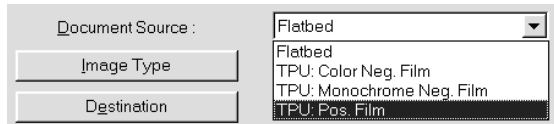
Most illustrations shown in this section are for Windows, so they may vary in appearance from what actually appears on your screen. The instructions are the same, except as noted.

Selecting a Document Source

When scanning a reflective document placed on the document table of the scanner, leave the Document Source set to Flatbed. Other selections are available depending on what is installed. They are the optional TPU: Color Neg. Film, TPU: Monochrome Neg. Film, and TPU: Pos. Film (for the Film Adapter).

Note:

Uninstalled options are not displayed.



Flatbed

Choose this setting to scan reflective documents.

TPU: Color Neg. Film, TPU: Monochrome Neg. Film, TPU: Pos. Film

Select one of them depending on the type of film (negative or positive, color or monochrome) you are scanning while using the Film Adapter. If you are scanning color negative film, select TPU: Color Neg. Film; for monochrome negative film, select TPU: Monochrome Neg. Film; for positive film (or slides), select the TPU: Pos. Film setting.

Note for Perfection 1650 Photo users:

- ❑ *When you change the Document Source from Flatbed to transparent materials (TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film), a message appears informing you to remove the reflective document mat.*

- ❑ *The settings you used when you closed EPSON TWAIN last time remains effective. Therefore, if you scanned transparent materials by setting the Document Source to TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film, when you start EPSON TWAIN again and try to scan reflective documents using the reflective document mat, an error message appears. When this happens, set the Document Source to Flatbed.*

Selecting an Image Type

Use the Image Type list to select from a variety of predefined and user-defined settings, or use the Image Type button to make detailed changes to settings and to save custom settings.

Note:

When Document Source is set to TPU: Monochrome Neg. Film, or the Thumbnail preview is activated, the Image Type button is not displayed.

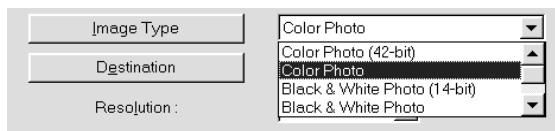


Image Type list

The Image Type list provides the predefined settings described below. There is a predefined setting to suit most image types, so EPSON recommends using the predefined settings first. Click the arrows on the right to view all of the available settings. If you later want to make fine adjustments to the Image Type setting, use the Image Type button. See “Image Type button” on page 4-8 for details.

Depending on your scanner type, some image types do not appear.

When Document Source is set to TPU: Monochrome Neg. Film, or the Thumbnail preview is activated, only Color Photo and Black & White Photo are available in the Image Type list.

Color Photo (42-bit)

42-bit color, best quality, for Perfection 1650 only

This setting is useful when scanning positive or negative film for further editing.

Note:

This setting is available only in certain applications, such as Adobe® Photoshop®.

Color Photo

24-bit color, best quality

This setting is useful when scanning color photo.

Color Document

24-bit color and best quality with de-screening to remove moiré patterns

This setting is useful when scanning magazines or catalog in color. For information on moiré patterns, see “Moiré (cross-hatch) patterns appear in the scanned image.” on page -17.

Black & White Photo(14-bit)

14-bit gray, best quality, for Perfection 1650 only

This setting is useful when scanning positive or negative film for further editing.

Note:

This setting is available only in certain applications, such as Adobe Photoshop.

Black & White Photo

8-bit gray, best quality

This setting is useful when scanning black and white photo.

Black & White Document

8-bit gray, best quality with de-screening to remove moiré patterns

This setting is useful when scanning magazines or catalog in black and white. For information on moiré patterns, see “Moiré (cross-hatch) patterns appear in the scanned image.” on page -17.

Illustration

24-bit color, best quality with color smoothing

This setting is useful when scanning large area of solid colors (for example, logos, illustrations, and charts).

Text/Line Art

Black and white, draft quality

This setting is useful when scanning characters-only documents or line drawings without coloring.

Text (Background Removal)

Black and white, best quality, Text Enhancement Technology, for Perfection 1650 only

This setting is for OCR (Optical Character Recognition).

Copy & Fax

Black and white, hard halftone, draft quality, Auto Area Segmentation, for Perfection 1650 only

Image Type button

The Image Type button opens the Image Type dialog box, where you can customize the Image Type settings described in this section.

Click the Image Type button. The following dialog box appears.

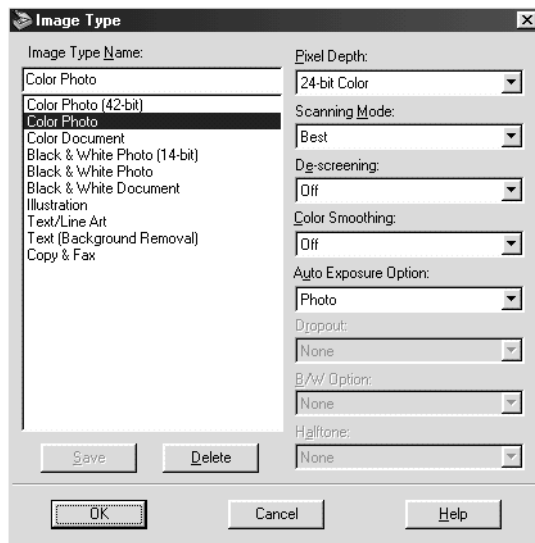


Image Type Name

The names of predefined settings and any custom settings you have saved appear in the Image Type Name list.

Pixel Depth

Select scanning colors from:

- 42-bit Color
- 24-bit Color
- 14-bit Gray
- 8-bit Gray
- Black & White

Note:

- 42-bit Color and 14-bit Gray are used only for Perfection 1650.
- Be aware that some applications do not support more than 24 bits of color or 8 bits of gray.

Scanning Mode

Use this setting to select between speed and quality. Best provides the best quality image, while Draft provides faster scanning with some loss of quality.

Note for Perfection 1250 users:

This function appears dimmed and is not available.

De-screening

Select either On or Off. When On is selected, moiré patterns are automatically removed from scanned images, but scanning takes longer. For information on moiré patterns, see “Moiré (cross-hatch) patterns appear in the scanned image.” on page -17.

De-screening is available when the resolution is set from 25 to 800 dpi.

Note:

De-screening appears dimmed and is not available when Pixel Depth is set to Black & White.

Color Smoothing


Select either On or Off. When On is selected, colors in an image are related to limited number of index colors. This is useful when scanning large areas of solid colors (for example, logos, illustrations, and charts).

Note:

- The pixel depth of output image is 24-bit color.*
- Color Smoothing is available only when Pixel Depth is set to 24-bit Color.*
- If Color Smoothing is set to On, you need to preview the image before scanning.*

Auto Exposure Option

Allows you to specify the kinds of adjustments made by the Auto Exposure feature. When Photo is selected, Auto Exposure activates and optimizes image enhancement for photographic image source. When Document is selected, Auto Exposure optimizes image enhancement for printed matters, such as brochure, magazine or newspaper. When scanning photographs or documents which contain high quality images, select Photo. Select Document when scanning printed text.

You can see the effects of the Auto Exposure Option setting in the Preview window when you click the  Auto Exposure button.

Note:

Auto Exposure Option appears dimmed and is not available when Pixel Depth is set to Black & White.

Dropout

Select a color to subtract from a black and white scan of a colored original. Proper use of dropout can improve the quality of your black and white scans. Available dropout options are: None, Red, Green, and Blue.

Note:

- Dropout is available only when Pixel Depth is set to 14-bit Gray, 8-bit Gray, or Black & White.*
- Depending on the image you scan, you may need to adjust the Threshold setting in the Image Controls dialog box before making the Dropout setting to achieve the desired effect. See "Optimizing Text Scanning for OCR" on page 6-18.*

B/W Option

These options are useful when scanning text or grayscale images. Select from: Text Enhancement Technology, Auto Area Segmentation, or None.

Text Enhancement Technology (TET)

To improve recognition accuracy during OCR (Optical Character Recognition) scanning, select this option. This function eliminates the document background from scans.

Auto Area Segmentation (AAS)

To make grayscale images clearer and text recognition more accurate, select this option. This function separates text from graphics.

Note:

- B/W Option is available only when Pixel Depth is set to Black & White.*

- When you need neither Text Enhancement Technology nor Auto Area Segmentation, select None.*

Halftone

Select a halftone or dither setting to reproduce images using special dot patterns:

- Mode A (Hard Tone)
- Mode B (Soft Tone)
- Mode C (Net Screen)
- Dither A (4 × 4 Bayer)
- Dither B (4 × 4 Spiral)
- Dither C (4 × 4 Net Screen)
- Dither D (8 × 4 Net Screen)
- None

Note:

Halftone is available only when Pixel Depth is set to Black & White.

Save/Delete/OK/Cancel/Help buttons

To save the settings you made as a group of custom settings, type a new name in the Image Type Name box, then click Save.

To delete an Image Type setting, select the setting name to be deleted in the Image Type Name list, then click Delete.

To apply the settings you made, click OK. The Preview window displays the effects of the current settings except for De-screening, Text Enhancement Technology (TET) and Auto Area Segmentation (AAS) settings.

To cancel the settings, click Cancel.

To access the online help, click Help.

Note for Windows users:

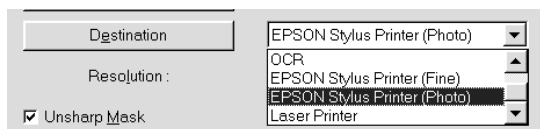
Clicking the close button in the upper right corner of the dialog box has the same affect as clicking Cancel.

Selecting a Destination

The Destination setting allows you to specify the application or the output device for which the scanned image is intended. Use the Destination list to select a predefined or user-defined destination, or use the Destination button to customize Destination settings.

Note:

When the Thumbnail preview is activated, Destination button is not displayed.



Destination list

The Destination list contains the following predefined settings and any custom settings you have saved in the Destination dialog box. Click the arrows on the right to view all of the available settings.

Destination Name	Resolution	
	Black & White	Gray/Color
Screen/Web	96 dpi (for Windows) 72 dpi (for Macintosh)	96 dpi (for Windows) 72 dpi (for Macintosh)
Fax	200 dpi	200 dpi
OCR	300 dpi	300 dpi
EPSON Stylus Printer (Fine)	360 dpi	150 dpi
EPSON Stylus Printer (Photo)	720 dpi	300 dpi
Laser Printer	600 dpi	200 dpi

If you are using an EPSON Stylus printer and are printing scanned images with the Economy, Normal, or Fine Print Quality settings in your printer software, selecting EPSON Stylus Printer (Fine) is recommended. If you are printing with the SuperFine or Photo Print Quality settings, select EPSON Stylus Printer (Photo).

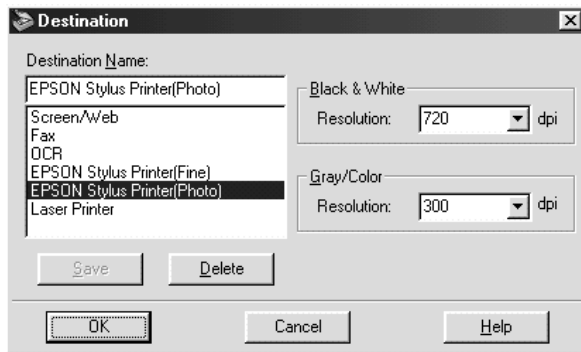
Note:

The effects of the Destination settings cannot be viewed in the Preview window.

Destination button

The Destination button opens the Destination dialog box, where you can change Resolution settings and add your custom settings to the Destination list, as described below.

Click the Destination button. The following dialog box appears.



Destination Name

Predefined and custom setting names appear in the Destination Name list. Select a setting from the list, or save new custom settings by typing a name in the Destination Name box, then click Save.

Resolution

Select a scanning resolution for Black & White or Gray/Color.

Note:

- ❑ *When the Pixel Depth setting in the Image Type dialog box is set to Black & White, the Black & White setting takes effect. For other Pixel Depth settings, the Gray/Color setting takes effect.*
- ❑ *To print your scanned document when Resolution is set to Black & White, select the same resolution setting from the list as you select in the printer driver. To print your scanned document when Resolution is set to Gray/Color, select a resolution between 150 and 300 dpi. If you select a higher resolution, the Gray/Color setting requires longer to print, but does not improve the output quality.*

- ❑ *The Resolution setting is closely related to the Image Size and Scale settings. If you change them arbitrarily, the resulting image may not be what you expected.*
- ❑ *The range of resolution values depends on your scanner.*

Save/Delete/OK/Cancel/Help buttons

To save the settings you made, type a new name in the Destination Name box, and then click Save.

To delete a Destination setting, select the target setting name to be deleted in the Destination Name list, then click Delete.

To apply the settings you made, click OK. To cancel the settings, click Cancel.

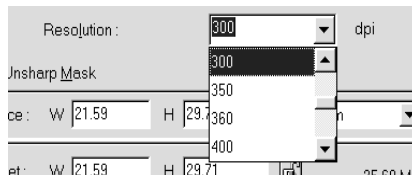
To access the online help, click Help.

Selecting the Resolution

The resolution for the current scanning operation can be changed by selecting a resolution or typing in the value. This setting overrides the resolution setting you make in the Destination dialog box.


Note:

The range of resolution values depends on your scanner.




Using the Preview Buttons

Before you scan an image, you can use the Preview buttons to preview it and see how your adjustments will affect the image as you make them.

Clicking the  Full Preview button starts prescanning and then shows the preview image on the right side of the Manual mode window, where you can view and adjust the quality of your image before scanning. See “Overview of the Preview Window” on page 5-1 for more details.

After previewing an image, you can access the Image Controls, Color Adjustment, and Tone Correction dialog boxes that contain tools for optimizing your image. For details on optimizing an image, see “Recommended Adjustment Order” on page 6-1.

Using the Scan Button

Clicking the  Scan button scans the image or the active marquee in the Preview window.

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

The scanned image is transferred to the application software you used to open EPSON TWAIN so that you can work with the image from within that application.

Depending on the application, you need to close the Manual mode window before working with the scanned image. To close the Manual mode window, click Close.

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.*

- ❑ *For information on further editing of the scanned images, refer to your application's documentation.*
- ❑ *After an image is scanned, be sure to save it. See “Saving a Scanned Image” on page 2-13.*

Using the Preview Window

Overview of the Preview Window

Before you scan an image, you can use the Preview window to see the effects of most EPSON TWAIN settings, and to make additional image adjustments.

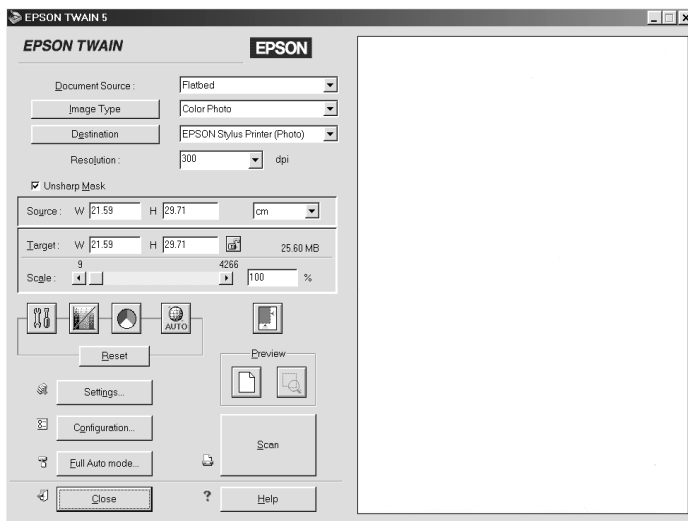
Clicking the  Full Preview button starts prescanning and previews the image. EPSON TWAIN offers two preview methods: Preview and Thumbnail preview.

Preview

When you scan reflective documents or want to see the entire image, use this method.

When the Document Source is set to Flatbed, or the Automatic Thumbnail Preview for Film check box in the Configuration dialog box is not selected, the entire preview image is displayed in the Preview window. The Preview window is the right side of the Manual mode window. See "Preview" on page 5-4 for more details.

Preview window



Thumbnail preview

Use this method to scan transparent materials. In the Thumbnail preview, EPSON TWAIN automatically locates the frames of the film, applies the Auto Exposure feature to each image, and previews them as thumbnail images.

When the Document Source is set to transparent materials (TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film) and the Automatic Thumbnail Preview for Film check box in the Configuration dialog box is selected, thumbnail images are displayed in the Preview window. See “Thumbnail Preview” on page 5-8 for more details.

Thumbnail preview



Modifying the preview image

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

- Unsharp Mask in the Manual mode window
- Pixel Depth, Dropout, and Halftone in the Image Type dialog box
- 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

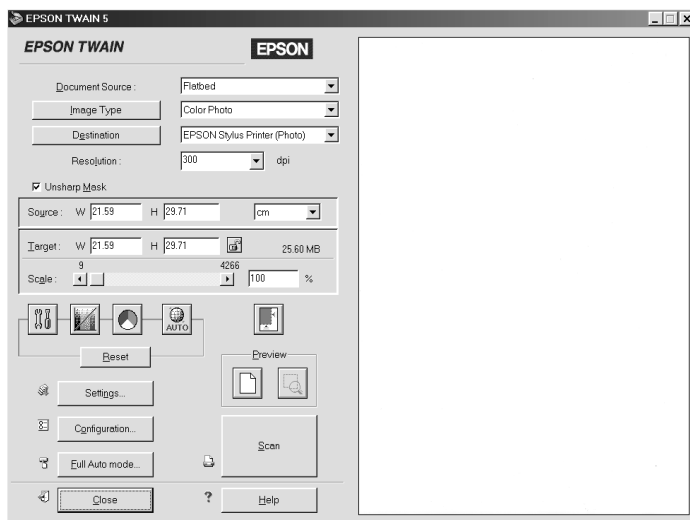
Note:

Although the image in the Preview window changes as you make settings, the settings do not affect the actual image until you scan or re-scan the image.

Preview

With a preview image in the Preview window, you can see the effects of settings you made and make additional image adjustments. You can also use a marquee (frame) to scan only selected portions of an image.


Preview window



Note:

See “Making Configuration Settings” on page 7-2 for information about how to control preview image quality.

Using the Full Preview button


After selecting Document Source, Image Type, and Destination, click the  Full Preview button to start prescanning and preview the entire image.

A preview image appears in the Preview window. When the Automatic Preview check box in the Configuration dialog box is selected, a preview image is automatically displayed after EPSON TWAIN starts. See “Making Configuration Settings” on page 7-2.


Note for Perfection 1650 users:

Make sure the Fast Preview check box is cleared in the Configuration dialog box to ensure a high-quality preview.


Using the Zoom Preview button

To preview a part of the image that is already in the Preview window, click and drag the mouse over the area you want to see in detail, and click the  Zoom Preview button. For more information on selecting portions of images, see “Using a marquee” on page 5-5.

Note:

When previewing images of negatives using a film holder in the Preview window, the color may appear odd as the frame of the film holder is perceived as white, causing your scans to appear darker. To see the correct color, click and drag the mouse over an area, then click the  Zoom Preview button.

Using a marquee

A marquee is a frame which you draw around a portion of a previewed image to select it. You can use a marquee to select an area you want to enlarge using the  Zoom Preview button.

To create a marquee, move the pointer over the image in the Preview window. The pointer becomes a set of cross-hairs. Hold down the mouse button and drag the cross-hairs over an area of the image, then release the mouse button to create the marquee.

The frame around the marquee appears as a moving dotted line, indicating that it is active, which means that it can be resized.

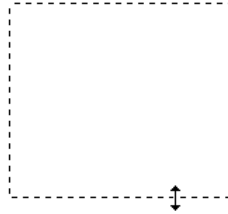
The point where you first clicked is anchored, but the rest of the frame is sizable and movable.



When the mouse pointer is placed within the marquee (the frame of the selected image area), it changes to a hand. You can click and drag the marquee anywhere in the Preview window. If you drag a hand while pressing the Shift key, the marquee will be limited to vertical or horizontal movement.




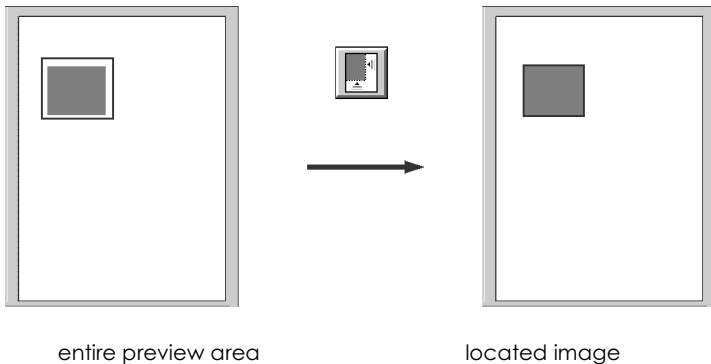
When the mouse pointer is placed on the edge of the marquee, it changes to an arrow allowing you to re-size the marquee. If you drag an arrow while pressing the Shift key, the marquee will be resized proportionally.




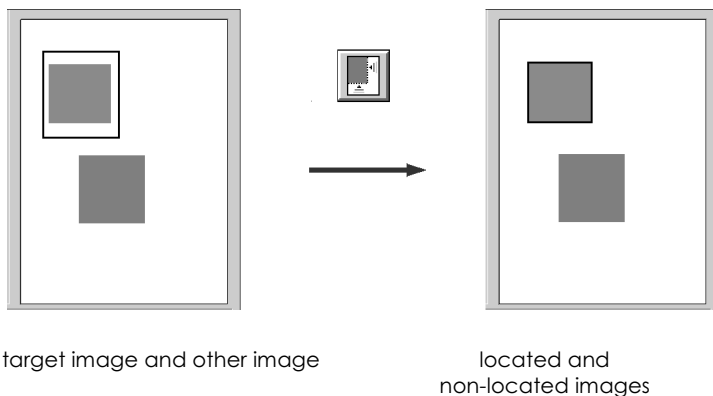
To remove or delete a marquee, double-click the Preview window.

Using the Auto Locate button

Click the  Auto Locate button in the Manual mode window to cause the scanner to automatically locate and select the target image. The image appears without white borders in the Preview window.



If a document contains more than one image, select a target image by creating a marquee on the image and clicking the  Auto Locate button. The selected target image is located automatically.



Note:

Create a marquee only on the target image. If the marquee covers other images as well, the Auto Locate feature does not work as expected.

Thumbnail Preview

When you scan transparent materials, you can preview images in the thumbnail layout. In the Thumbnail preview, EPSON TWAIN automatically locates the frames of the film and applies the Auto Exposure feature to each image. You can modify each thumbnail image and make additional image adjustments.


Thumbnail preview






Each thumbnail image is assigned a sequential number which appears under the image. Select the image number check box you want to scan, and then click **SCAN**. At least one thumbnail image must be selected; you cannot clear all of the image number check boxes.

To modify a thumbnail image, click to select it and then choose the appropriate settings. The selected image has a blue frame around it.


Some buttons are unique to the Thumbnail preview; otherwise some settings are not displayed. See the table below to know the unique buttons in the Thumbnail preview.

Button	Name	Function
	Zoom Preview button	Zoom into the selected thumbnail image in the Preview window. See "Using the Zoom Preview button" on page 5-12.

	Return button	Return to the Thumbnail preview. See "Using the Zoom Preview button" on page 5-12
	90 Degrees Rotate button	Rotate the selected image clockwise by 90 degrees. See "Using the 90 Degrees Rotate button" on page 5-13.
	Mirroring button	Change the selected image to the mirror image. See "Using the Mirroring button" on page 5-13.

In the Thumbnail preview, the scanning size is automatically defined and you cannot create a marquee. If you want to change the scanning area, clear the Automatic Thumbnail Preview for Film check box in the Configuration dialog box and use a marquee. See "Using a marquee" on page 5-5.

Note:


- ❑ *The Image Type button, Destination button, and  Auto Locate button are not displayed in the Thumbnail preview. The Source size, Lock button, and Settings button appear dimmed and are not available.*
- ❑ *The Image Type, Destination, Resolution, Unsharp Mask and Units menus apply to all of the images in the Thumbnail preview.*
- ❑ *In the Thumbnail preview, the Auto Exposure feature applies to each thumbnail image after the previewing.*
- ❑ *Color Photo and Black & White Photo are available in the Image Type list.*
- ❑ *While the image is being previewed in high resolution, the 90 Degrees Rotate button and the Mirroring button features take time to perform.*

- ❑ *If you want to make more settings or scan non-standard film sizes, clear the Automatic Thumbnail Preview for Film check box in the Configuration dialog box and switch to the Preview mode. See “Making Configuration Settings” on page 7-2.*
- ❑ *If you cannot scan transparent materials from the Thumbnail preview, switch to the Preview mode and use the marquee. See “You cannot scan the film from the Full Auto mode or the Thumbnail preview.” on page -15 for details.*

Note for Perfection 1650 users:


If multiple slides are scanned using the optional Film Adapter and then displayed in the Thumbnail preview, the sequence of the thumbnail images does not follow the actual order of the scanned slides. The sequence of the thumbnail images starts from the top right image and runs vertically.

Using the Full Preview button


After selecting Document Source (TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film depending on the type of film you are scanning), click the  Full Preview button to start prescanning and display the Thumbnail preview. Images are displayed in the Preview window as thumbnail images.

When the Automatic Preview check box in the Configuration dialog box is selected, a preview image is automatically displayed after EPSON TWAIN starts. See “Making Configuration Settings” on page 7-2.

Using the Zoom Preview button

To enlarge a thumbnail image, use this button. After selecting a desired thumbnail image in the Preview window, click the  Zoom Preview button. The selected image is zoomed in as shown below.




You can modify an image while zooming. To scan an image, you need to return to the Thumbnail preview. To return to the Thumbnail preview, click the  Return button.

Note:

- ❑ While zooming, you cannot scan an image or create a marquee.
- ❑ When you double-click the thumbnail image, the image is zoomed in. To return to the Thumbnail preview, double-click the zoomed image again.


Using the 90 Degrees Rotate button

Click the  90 Degrees Rotate button to rotate the selected image clockwise by 90 degrees. Each click turns the image by 90 degrees.

Note for Perfection 1650 Photo users:

The images of the 35-mm film strip are automatically rotated clockwise by 90 degrees; hence your film holder is positioned vertically.

Using the Mirroring button

Click the  Mirroring button to change the selected image to the mirror image. A small icon appears under the mirror image in the Preview window.

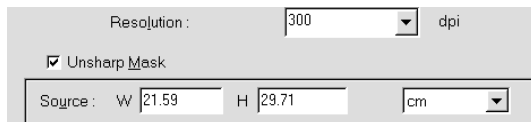


Selecting the Unsharp Mask

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

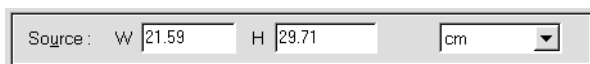
Note:

If Pixel Depth is set to Black & White or Color Smoothing is set to On in the Image Type dialog box, this check box appears dimmed and cannot be selected.

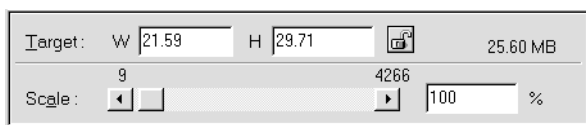


Specifying Source and Target Image Sizes

The Source fields indicate the size of the image that is displayed or selected in the Preview window.



The Target fields indicate what size the image will be when it is output.



Note:

The Source and Target size settings are closely related to the Resolution setting. If you change these settings arbitrarily, the resulting image may not be what you expect.

Width (W) and height (H) values

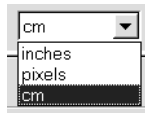
The Source and Target width and height values are indicated in the selected unit of measure. You can type new values directly in the indicator fields, or you can change the image area in the Preview window by creating a marquee, or frame. Do this by dragging the mouse over the desired area. See “Using a marquee” on page 5-5 for more information on marquees.

Note:

When the Thumbnail preview is activated, the Source size appears dimmed and is not available.

Units menu

Select a unit of measurement. You can select either inches, pixels, 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.

Lock button



locked



unlocked

The current size of width-to-height of the target image can be locked, allowing the ratio of width-to-height of the Source image to change according to the scale value, or the scale value to change according to the ratio of width-to-height of the Source image. This is especially useful in cases where the size of an image does not fit the size of the paper on which you want to print the image, but you want to keep the image's original proportions. Enter the size of the paper in the Width and Height fields of the Target box and then click the LOCK button. The scale value is automatically changed, maintaining the current ratio of width-to-height to fit the paper.

Note:

When the Thumbnail preview is activated, the LOCK button appears dimmed and is not available.

Scale slider


An image can be reduced or enlarged by moving the Scale slider. You can also click the left or right arrow to change the image size in 1% increments.

The range of possible reduction or enlargement varies depending on the current resolution setting.


Scale indicator

The percentage of enlargement or reduction is shown in the Scale indicator field. You can type a new value directly into this field, or use the Scale slider to determine the value.

Using the Auto Exposure Button

Click the  Auto Exposure button in the Manual mode 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:

- ❑ *Select Continuous Auto Exposure on the Color menu of the Configuration dialog box to set the Auto Exposure feature to work whenever you click the  Full Preview button, modify the size of the previewed image with the zoom feature, make a marquee, or change the size or location of a marquee. See “Color menu” on page 7-4 for more information.*
- ❑ *The Auto Exposure button appears dimmed and is not available when Pixel Depth is set to Black & White and Auto Area Segmentation is not selected in the Image Type dialog box.*
- ❑ *The Auto Exposure feature is automatically activated when scanning from the Full Auto mode.*

Recommended Adjustment Order

EPSON TWAIN 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 Manual mode window. This section provides general information on optimizing images with these tools.

To optimize images manually, adjust the following EPSON TWAIN 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 6-2 and “Adjusting the Shadow setting” on page 6-4.
2. Adjust the Gamma setting in the Image Controls dialog box. See “Adjusting the Gamma setting” on page 6-5.
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 6-6.

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 6-11.
5. Adjust the Saturation setting in the Color Adjustment dialog box. See “Adjusting the Saturation setting” on page 6-13.

6. Manually adjust the tone curve for individual colors in the Tone Correction dialog box. See “Using the tone curve” on page 6-13.

To make the following adjustments in EPSON TWAIN, you need to display a preview image in the Preview window or the Thumbnail preview. See “Overview of the Preview Window” on page 5-1 for details.

Adjusting Brightness and Contrast

Adjust brightness and contrast before adjusting image color. Brightness and contrast settings should be made in the order shown above they appear in this section.

Adjusting the Highlight setting

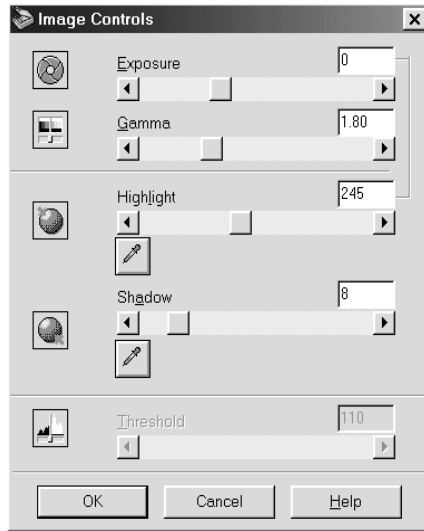
Highlights are the brightest areas of an image. Follow these steps to adjust the Highlight setting.

1. Click the  Image Controls button in the Manual mode window to open the Image Controls dialog box.

Note:

- The Image Controls button appears dimmed and is not available when B/W Option is set to Text Enhancement Technology in the Image Type dialog box.*
- The Image Controls settings are optimized automatically when you scan from the Full Auto mode.*
- If Pixel Depth is set to Black & White and Halftone is set to None in the Image Type dialog box, all the settings except Threshold appear dimmed and is not available.*

2. In the Image Controls dialog box, click the  eyedropper button under Highlight.



The mouse pointer changes to an eyedropper, with movement restricted to within the Preview window.

Note:

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

3. 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.

4. 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.

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



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

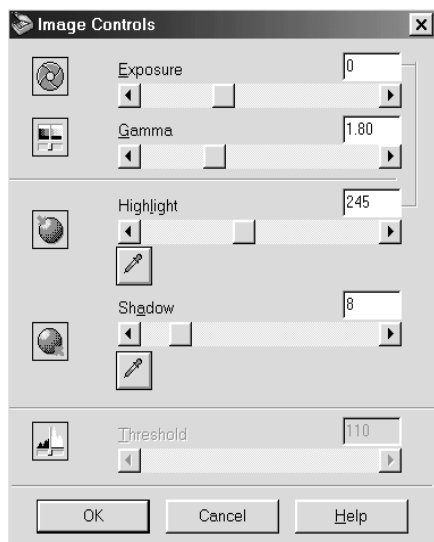
Note:

Click Cancel to restore the original image.

Adjusting the Shadow setting

Shadows, the darkest areas of an image, are the opposite of highlights. Follow these steps to adjust the Shadow setting.

1. Click the  Image Controls button in the Manual mode window.
2. In the Image Controls dialog box, click the  eyedropper button under Shadow.



The mouse pointer changes to an eyedropper, with movement restricted to within the Preview window.

Note:

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

3. Move the eyedropper to the location you want to select as the shadow point, and then click.


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.

4. 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.

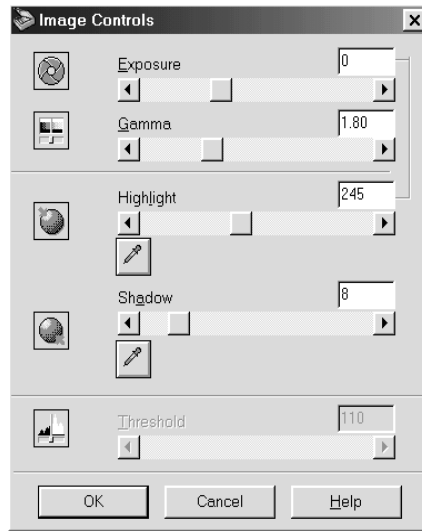
Adjusting the Gamma setting

Gamma is the difference in contrast between the light tones and dark tones of an image. Changes in the gamma level only affect mid-tones, and can be effective for bringing out details normally hidden in shadow or highlights.

Follow these steps to adjust the Gamma setting.


1. Click the  Image Controls button in the Manual mode window.

2. Move the Gamma slider left or right, or enter a value between 0.5 and 5.0 in the text box.



Applying a preset tone curve

The Tone Correction feature provides preset tone correction curves that let you adjust the contrast within an image. This gives you more control over the image when used in conjunction with the settings in the Image Controls dialog box.

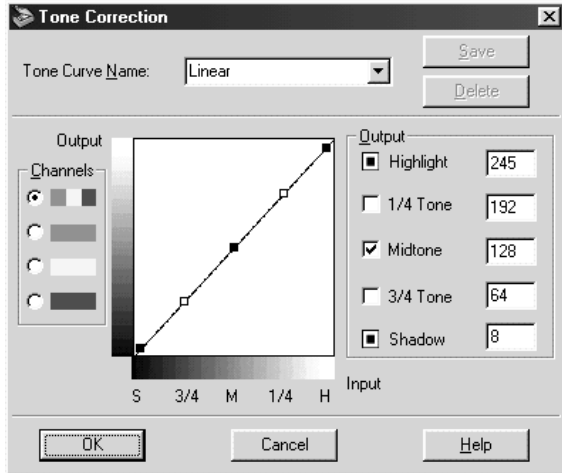
Click the  Tone Correction button in the Manual mode window to open the Tone Correction dialog box. The Tone Curve Name list in the Tone Correction dialog box provides the six most common tone correction curves, described below.

Note:

- ❑ *The default setting is the Linear.*

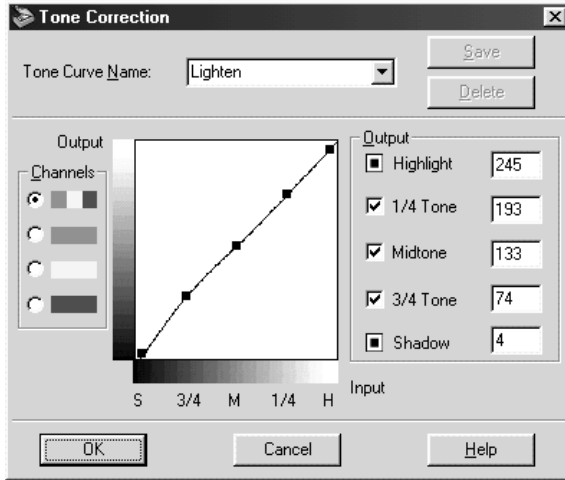
- ❑ *The Tone Correction button appears dimmed and is not available when Pixel Depth is set to Black & White and Halftone is set to None, or B/W Option is set to Text Enhancement Technology in the Image Type dialog box.*

Linear



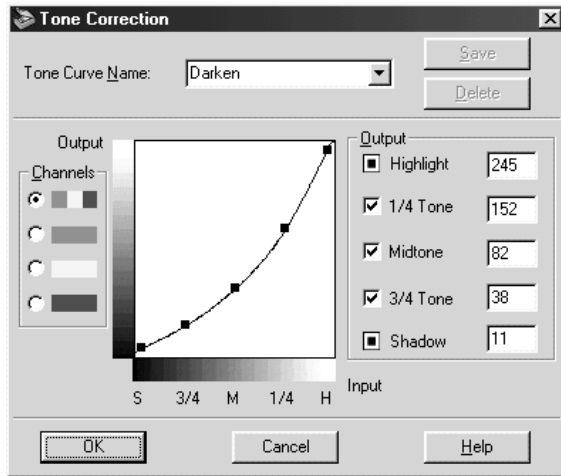
A linear tone curve has no tone correction and the default setting. Use this setting if you are satisfied with the tone of the preview image.

Lighten



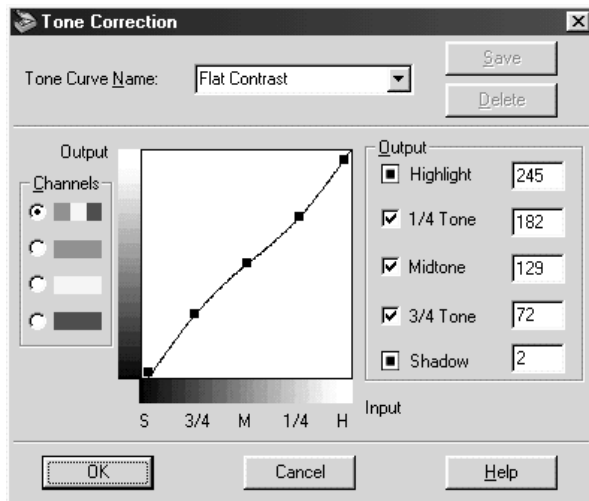
Adjusts darker images (like underexposed film) to make them slightly brighter.

Darken



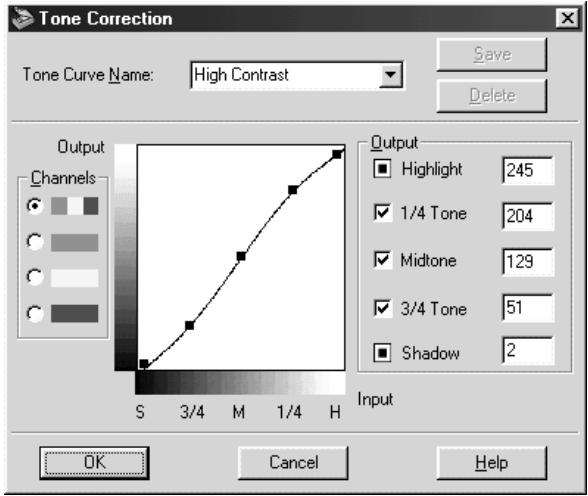
Adjusts brighter images (like overexposed film) to make them slightly darker.

Flat Contrast



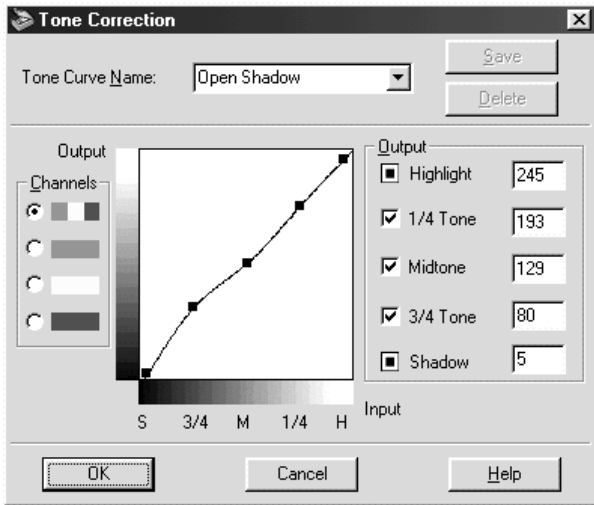
Flattens high contrast images to make them look more natural.

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 6-13 for more information on tone correction.

Adjusting Color

Color adjustments should be made after adjusting settings related to brightness and contrast. Color settings should be made in the order shown above they appear in this section.


Adjusting the Gray Balance Intensity setting

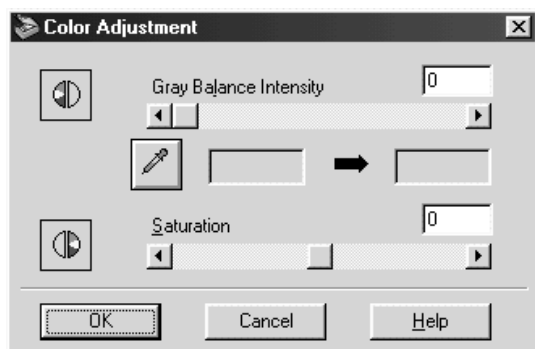
Gray Balance Intensity setting allows you to remove a cast (tint) from a specific color.

1. Click the  Color Adjustment button in the Manual mode window to open the Color Adjustment dialog box.

Note:

The Color Adjustment button appears dimmed and these settings cannot be selected when Pixel Depth is set to 14-bit Gray, 8-bit Gray, or Black & White.

2. In the Color Adjustment dialog box, click the  eyedropper button under Gray Balance Intensity.



The mouse pointer changes to an eyedropper, with movement restricted to within the Preview window.

Note:

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

3. Move the eyedropper to a 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.

4. To change the gray balance intensity level of the color you selected, 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. Your changes are also reflected in the image in the Preview window.


Note:

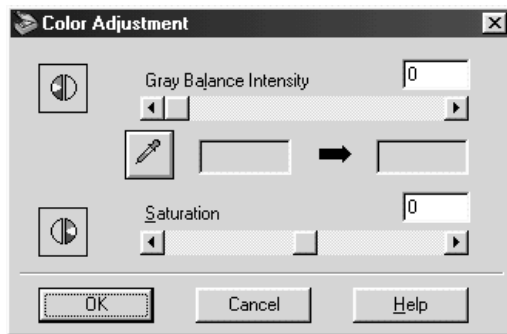
Click Cancel to restore the original image.

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.

Follow these steps to adjust the Saturation setting.

1. Click the  Color Adjustment button in the Manual mode window.
2. Move the Saturation slider left or right, or input a value between -100 (lowest color density) and 100 (highest color density).




Using the tone curve

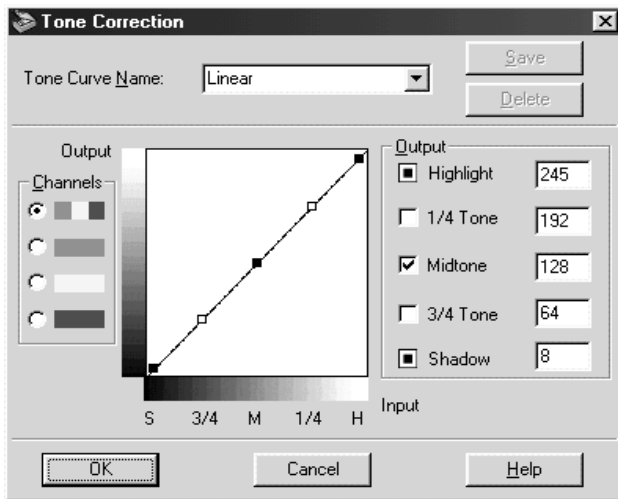
The tone curve provides you with a versatile means for adjusting the intensity of the colors of the image being scanned. You can adjust the shadow, mid-tone, and highlight values, which helps to ensure well-balanced coloring of the image.

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 Auto Exposure and the Image Controls dialog box. Use of the tone curve to make initial settings is not recommended.*

- ❑ The Tone Correction button appears dimmed and is not available when Pixel Depth is set to Black & White and Halftone is set to None, or B/W Option is set to Text Enhancement Technology in the Image Type dialog box.

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



Tone Curve Name list

Use this list box to select a preset tone curve. There are six preset tone curves available as shown below, and you can add your own curves to the list using the procedure in the next section, “Saving your own tone curve” on page 6-17.

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

Curve Name	Highlight	1/4 Tone	Midtone	3/4 Tone	Shadow	Description
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.

Note:

If Pixel Depth is set to Black & White, 14-bit Gray, or 8-bit Gray in the Image Type dialog box, you can only select the combined RGB channel option.

Tone curve editor

Moving the mouse pointer into the tone curve editor causes it to change to a finger. Use this pointer to drag any of the five points in 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 in accordance with 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.*

Save/Delete/OK/Cancel/Help buttons

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

To delete a setting, select the name of the setting you want to delete in the tone correction list and click **Delete**.

To apply the current Tone Correction dialog box settings and close the dialog box, click **OK**.

To cancel the operation and close the dialog box, click **Cancel**.

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

Customizing your own tone curve

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. This causes the name shown in the Tone Curve Name list to change 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 under the name you specified.

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. Use the Tone Curve Name list to select the custom tone curve you want to delete.
2. Click **Delete**.
3. When a dialog box appears, click **Yes** to delete the curve.

Using the Reset Button

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

Optimizing Text Scanning for OCR

This section gives you suggestions and recommended settings in order to improve OCR (Optical Character Recognition) scanning results. (For Perfection 1650 only)

Scanning text

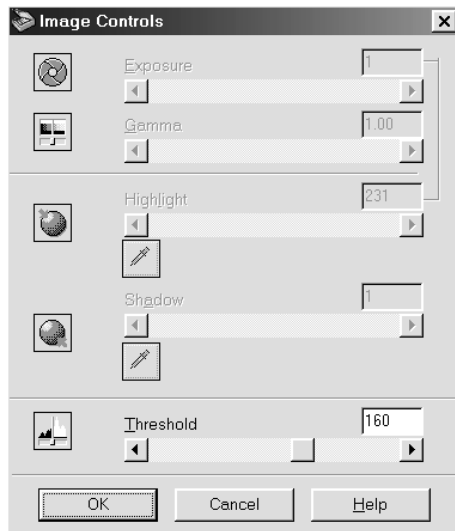
Make sure Text (Background Removal) is selected in the Image Type list box and OCR is selected in the Destination list box in the Manual mode window.

If the recognition rate is not satisfactory with the default settings, follow these steps to change the settings:

Improving character recognition

1. In the Manual mode window, make sure Text (Background Removal) is selected in the Image Type list box and OCR is selected in the Destination list box. Then click the Image Type button. The Image Type dialog box appears.
2. In the Image Type dialog box, select None for B/W Option, and then click OK.

3. In the Manual mode window, click the  Full Preview button. Then click the  Image Controls button to display the Image Controls dialog box.



4. 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.

Potential text recognition problems

The quality of the text in your original document greatly effects 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

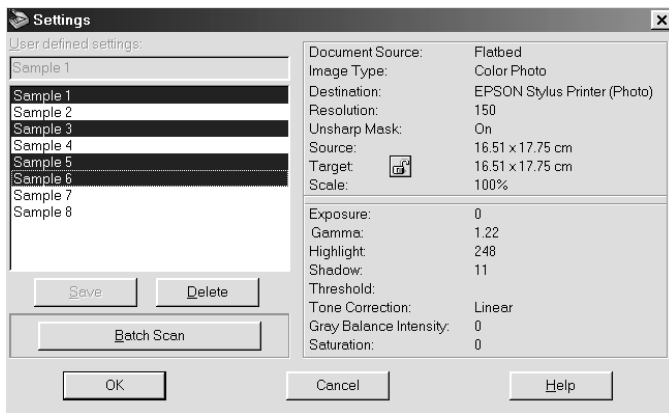
- ❑ Text with tightly-spaced characters or line pitch
- ❑ Text that is in tables or underlined
- ❑ Cursive or italic fonts, and font sizes less than 8 points

Remember that OCR software cannot recognize handwritten characters.

Customizing the Manual Mode Settings

Using the Settings Dialog Box

Click the Settings button in the Manual mode window to view the following dialog box. You can view all the settings for the currently previewed image in this dialog box. Also, you can apply any custom settings you have saved.



To save the currently selected settings, type a new name in the User defined settings field, then click Save.

To delete a setting from the list, select the setting name in the list, then click Delete.

To scan a single image with several different settings, make and save each group of settings as described above. Then hold down the Ctrl key while clicking the custom settings you want to select in the User defined settings list. After selecting all the settings you want to use when scanning, click Batch Scan. The scanner scans the image once for each group of settings you have selected.

To apply saved settings, select a setting name from the list, then click OK. The preview image will reflect the settings you saved.

To restore the previous settings, click Cancel.

To access the online help, click Help.

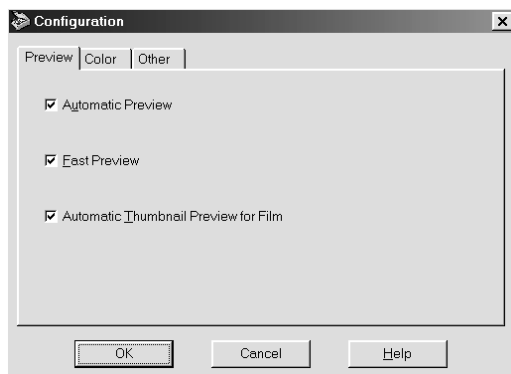
Note:

- When the Thumbnail preview is activated, the Settings button appears dimmed and is not available.*

- When Image Type is set to Illustration, or Color Smoothing is set to On, the Save button appears dimmed and is not available.*

Making Configuration Settings

Click the Configuration button in the Manual mode window to open the Configuration dialog box, where you can make a variety of configuration settings related to the Preview window and the preview image, and color adjustment.



Preview menu

This menu allows you to make basic settings that affect the properties of the Preview window.

Automatic Preview

Preview automatically starts when EPSON TWAIN is started.

Fast Preview

Enables high-speed loading of the preview image. If this check box is selected, the preview image is scanned in the Draft mode. If this is not selected, the preview image is scanned in the Best mode, and you can get accurate values for the Highlight, Shadow, and Gray Balance Intensity by sampling with the eyedropper in the preview image.

This check box is only available when the Document Source is set to Flatbed.

Do not use this feature (do not select the check box) when quality is more important than speed.


Note:

This check box appears dimmed and is not available when Document Source is set to transparent materials (TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film).

Note for Perfection 1250 users:

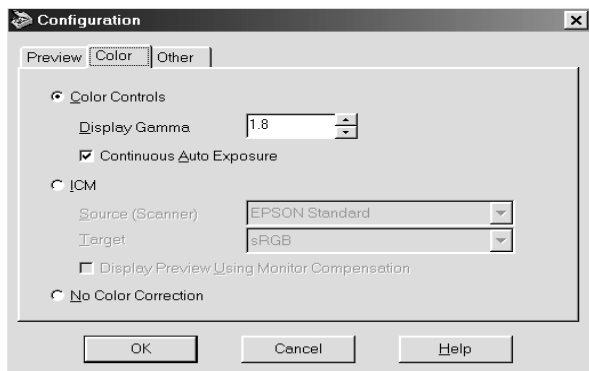
This function appears dimmed and is not available.

Automatic Thumbnail Preview for Film

When this check box is selected, the Thumbnail preview appears when you set the Document Source to TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film, and then click the  Full Preview button.

Color menu

Click the Color tab to display the Color menu.



This menu allows you to make a variety of settings related to color adjustment and color management. Choose the appropriate setting from the list below.


Setting	When to Select
Color Controls (default setting)	When not using a color management system with EPSON TWAIN
ICM (for Windows), or ColorSync (for Macintosh)	To use color management system profiles with EPSON TWAIN
No Color Correction	To make a color profile using a color calibration device

Color Controls


The Color Controls setting allows you to make settings that affect the gamma for your monitor and the way the Auto Exposure feature works.

Display Gamma

You can change the gamma value for your monitor by typing a value in the Display Gamma box, or by clicking the arrows next to the box. You can choose between values of 1.0 to 3.0 in increments of 0.1. The default setting is 1.8.

The Display Gamma setting also determines how clicking the  Auto Exposure button affects the Gamma setting.

Continuous Auto Exposure

Select this check box to make the Auto Exposure feature work whenever you click the  Full Preview button, modify the size of the preview with the zoom feature, make a marquee, or modify the size or change the location of a marquee.

If this check box is clear, the Auto Exposure feature will only work when you click the  Auto Exposure button in the Manual mode window.

Note:

This feature is only available when Color Controls is selected.

ICM (for Windows) or ColorSync (for Macintosh)

Select this setting to reproduce the colors in your image using the available color management system for your computer: ICM for Windows, or ColorSync for Macintosh. Selecting this setting enables you to choose a color profile for your scanner in the Source (Scanner) list box, and a color profile for your monitor or output device (such as printer) in the Target list box. After the image is scanned, it is converted according to these settings before it is sent to the application.

Note:

- The ICM and ColorSync settings are provided for experienced users. If you are not familiar with color management systems, select Color Controls to avoid unexpected results.*

- ❑ *If your printer and monitor do not support the available color management system, select Color Controls. See your printer and monitor documentation to check if they support ICM or ColorSync.*
- ❑ *When ICM or ColorSync is selected, the Continuous Auto Exposure setting is unavailable.*
- ❑ *If ICM or ColorSync is selected, whenever the Auto Exposure function is used, the Shadow setting in the Image Controls dialog box is automatically set to 8, and the Gamma setting is set to 1.0.*
- ❑ *If you select ICM or ColorSync in EPSON TWAIN when using Adobe Photoshop 5.0 or 5.5, be sure to clear the Display Using Monitor Compensation check box in Photoshop's RGB Setup Dialog box.*
- ❑ *Before scanning, be sure to make the appropriate System Profile settings in the ColorSync control panel for optimal color matching. For more information, see your Macintosh documentation.*

Source (Scanner)

Choose a color profile for the scanner you are using from this list box. EPSON recommends selecting EPSON Standard when using an EPSON scanner.

Target

In this list box you can choose a color profile that matches either your monitor or other output device, such as your printer, or you can choose one of the RGB color space profiles that matches those available in Adobe Photoshop.

To use the same color profile that is currently being used by your computer monitor, select Monitor RGB. To choose a different profile for your monitor or printer, select from the monitor and printer profiles in the list.

To choose a color profile that matches the RGB color space you are using in Adobe Photoshop, select that color space from the list. For more information on color management in Adobe Photoshop, see the Adobe Photoshop's documentation.

Note:

- If you made a color profile to calibrate your monitor using the Adobe Gamma utility, that profile appears in the Target list box.*
- The default Target setting in Windows is sRGB, and for Macintosh the default Target setting is Monitor RGB.*

Display Preview Using Monitor Compensation

The preview image is displayed with compensation using the ICM or ColorSync engine which covers from target space to monitor.

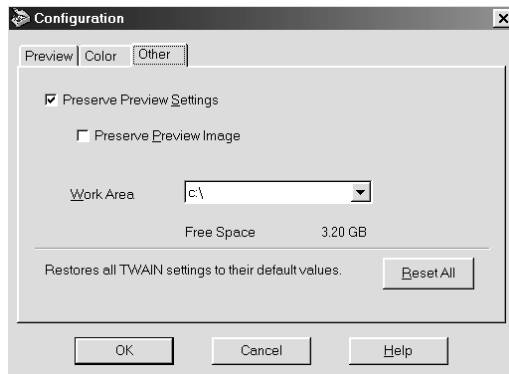
When this check box is selected, the final scanned image matches with the preview image in the Preview window of Adobe Photoshop. Photoshop adjusts the workspace of the internal image to match the monitor and displays the converted image. Since other applications do not support this function, we recommend that you clear this check box.

No Color Correction

This setting allows you to scan images without the adjusting the quality of the image at all. Select this setting for best results when making your own color profile using a color calibration device.

Other menu

Click the Other tab to display the Other menu.



Preserve Preview Settings

When this check box is selected, the Image Type, Destination, Resolution and Unsharp Mask settings are saved so that they remain effective the next time you start EPSON TWAIN.

Preserve Preview Image

When this check box is selected, the image shown in the Preview window is saved together with its associated settings so that it remains effective the next time you start EPSON TWAIN. This feature is useful when scanning the same document more than once, and is especially useful when using different TWAIN-compliant applications to scan the same document.

Note:

This check box appears dimmed and is not available when the Preserve Preview Settings check box is not selected or the Thumbnail preview is activated.

Work Area

Select a hard disk drive as a temporally working area for some image operations. Only the local hard drives are available on the list.

Free Space

Displays the free space of the drive selected as the Work Area.

Reset All

Click this button to initialize all TWAIN settings and restore the factory default settings.

Scanning by Using the Buttons

Buttons on the Scanner

The buttons on the scanner (⏏ Start, 🖨️ Photo Print, ✉️ Scan to E-mail, and 🌐 Scan to Web buttons) allow you to scan and send data to a target application or the EPSON photo-sharing site with a single press of the button.

Start button

Pressing the ⏏ Start button on the scanner starts EPSON Smart Panel as default. You can assign a desired application to the ⏏ Start button in the EPSON Smart Panel window; pressing the ⏏ Start button then starts the scanning process and sends data to the application. For more details, see “Assigning an Application in the EPSON Smart Panel Window” on page 9-11.



Photo Print button

You can use the 🖨️ Photo Print button to scan and then print images (photos or transparent materials) as photos. The images are scanned and then printed automatically in high quality with a single press of the 🖨️ Photo Print button on the scanner. For more details, see “Using the Photo Print Button” on page 8-3.

Scan to E-mail button

You can use the ✉️ Scan to E-mail button to scan an image and then send an e-mail message with the scanned image attached. Pressing the ✉️ Scan to E-mail button on the scanner starts the scanning process, transfers the scanned image to a pre-selected e-mail program, and then attaches the scanned image to a new e-mail message. For more details, see “Using the Scan to E-mail button” on page 8-4.



Scan to Web button


You can use the  Scan to Web button to scan an image and then upload it to the EPSON photo-sharing site. Pressing the  Scan to Web button on the scanner starts the scanning process and transfers the scanned image to the EPSON photo-sharing site. For more details, see “Using the Scan to Web Button” on page 8-7.

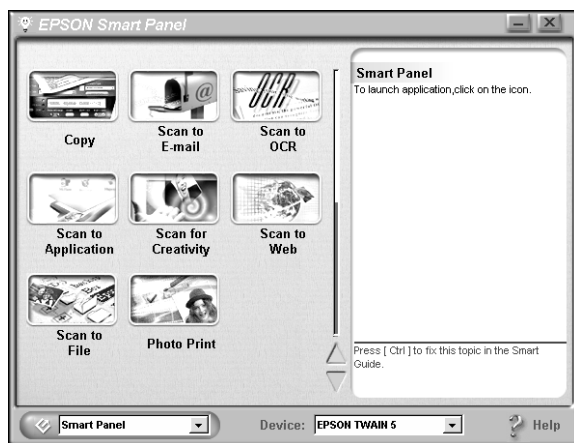
Note for Windows users:

The “Scanner events” is supported by Windows Me, 98, and 2000. You can assign a desired application to the button on the scanner. See “Assigning Another Application to the Buttons on Windows” on page 8-10 for details on setting up the buttons.

Using the Start Button

Pressing the  Start button on the scanner starts EPSON Smart Panel as default. You can assign a desired application to the  Start button in the EPSON Smart Panel window. For details, see “Assigning an Application in the EPSON Smart Panel Window” on page 9-11.

1. Press the  Start button on your scanner. The EPSON Smart Panel window appears.





2. Click an application icon. For details, refer to the EPSON Smart Panel documentation.

Note:

Depending on your scanner type, the available applications are different. For details, see “About Applications in the EPSON Smart Panel Window” on page 9-2.

Using the Photo Print Button

You can use the  Photo Print button on the scanner (together with the Photo Print utility in the EPSON Smart Panel window) to scan then print images as photos.

1. Press the  Photo Print button on the scanner. The following window appears.




2. The image is scanned and then printed automatically in high quality.


Note:

- To cancel the operation or change the setting, click the Cancel button on the Progress bar, and then change the setting.
- For details about the settings, refer to the EPSON Smart Panel documentation.

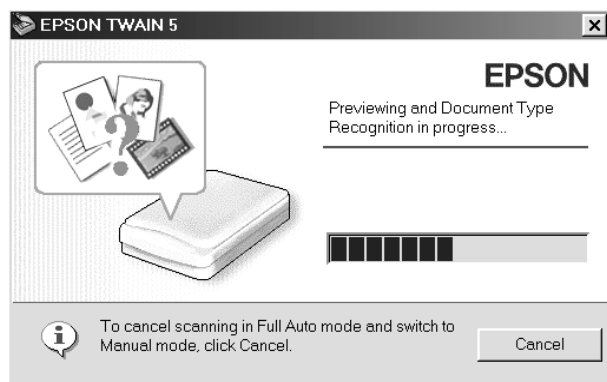
Using the Scan to E-mail button

You can use the  Scan to E-mail button to scan an image and then send an e-mail message with the scanned image attached.

Note:

An e-mail program must be installed on your computer before you can use the  Scan to E-mail button.

1. Press the  Scan to E-mail button on the scanner. The following window appears.

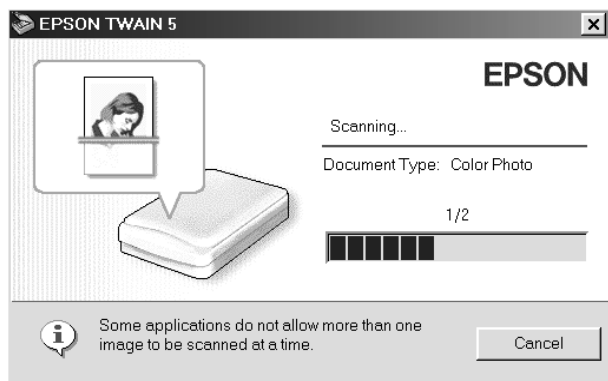


EPSON TWAIN automatically previews the images and recognizes the image type.

Note:

- To cancel the operation, click **Cancel** and then click **Close**.
- The mode you used when you closed EPSON TWAIN last time remains effective; therefore, if you closed EPSON TWAIN with the Manual mode, the Manual mode window appears in this session. If you want to switch to the Full Auto mode, click the Full Auto mode button in the Manual mode window.
- If you want to switch to the Manual mode, click **Cancel** and then click the Manual mode button. See "Overview of the Manual Mode Window" on page 4-1 for details.

2. The following window appears with a progress bar to indicate the scanning progress. You can see the type of document being scanned. When scanning multiple photos, you can also see the number of scanned images.




Images are automatically optimized. You can scan easily and quickly without changing any complex settings. EPSON TWAIN automatically recognizes the image type, locates the target image, detects the skew of the target image, adjusts the exposure, and then starts scanning.


3. The scanned image is transferred to a pre-selected e-mail program and then attached to a new e-mail message.

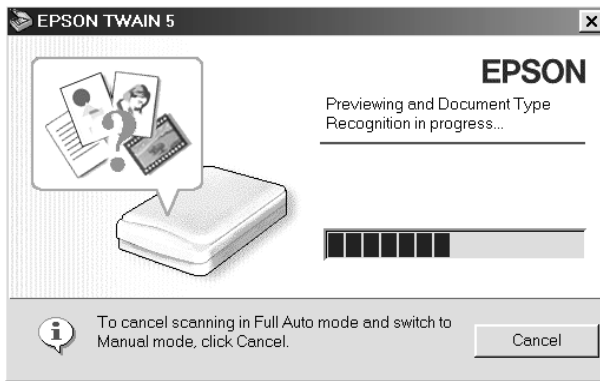
Note:

- ❑ *If no e-mail program has been selected, the Launch Assistant dialog box appears. For details, refer to the EPSON Smart Panel documentation.*
- ❑ *For details about the settings, refer to the EPSON Smart Panel documentation.*

Using the Scan to Web Button

You can use the  Scan to Web button to scan an image and then upload it to the EPSON photo-sharing site.

1. Press the  Scan to Web button on the scanner. The following window appears.

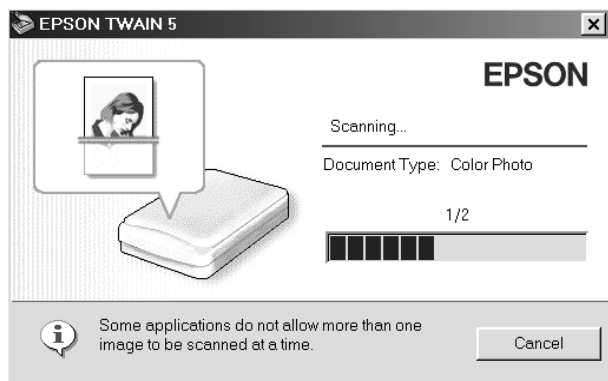


EPSON TWAIN automatically previews the images and recognizes the image type.

Note:

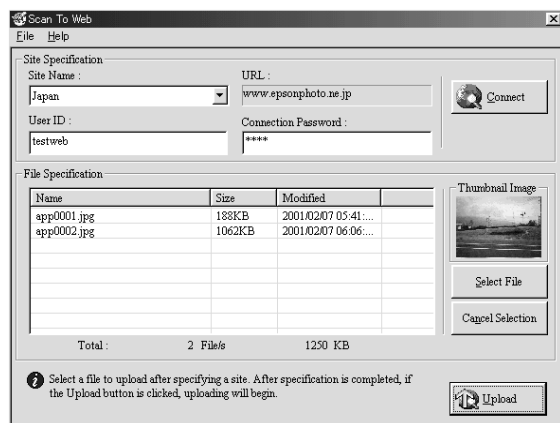
- To cancel the operation, click **Cancel** and then click **Close**.
- The mode you used when you closed EPSON TWAIN last time remains effective; therefore, if you closed EPSON TWAIN with the Manual mode, the Manual mode window appears in this session. If you want to switch to the Full Auto mode, click the Full Auto mode button in the Manual mode window.
- If you want to switch to the Manual mode, click **Cancel** and then click the Manual mode button. See "Overview of the Manual Mode Window" on page 4-1 for details.

- The following window appears with a progress bar to indicate the scanning progress. You can see the type of document being scanned. When scanning multiple photos, you can also see the number of scanned images.

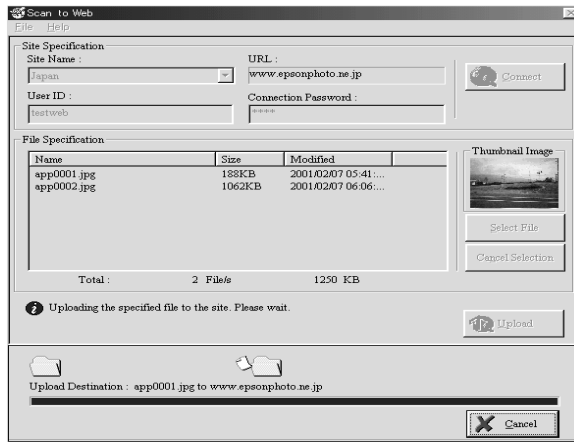


Images are automatically optimized. You can scan easily and quickly without changing any complex settings. EPSON TWAIN automatically recognizes the image type, locates the target image, detects the skew of the target image, adjusts the exposure, and then starts scanning.

- The following window appears. Click Upload.







4. A progress bar appears and the scanned image is uploaded to the EPSON photo-sharing site.



Note:

- You can send up to 16 images at a time to the EPSON photo-sharing site.
- The EPSON photo-sharing site may work differently depending on the country.
- For details about the settings, refer to the EPSON Smart Panel documentation.

Assigning Another Application to the Buttons on Windows

You can assign any application, other than EPSON Smart Panel, which supports “Scanner events” (for example, Imaging for Windows, as long as it is installed) on Windows Me (Millennium Edition), 98, or Windows 2000 to the button on the scanner. When you press the  Start,  Photo Print,  Scan to E-mail, or  Scan to Web button, EPSON TWAIN’s dialog box opens or scanning starts and the scanned image is automatically sent to the application (which does not need to be opened manually).

Note for Macintosh users:

On your Macintosh computer, you cannot assign any application other than EPSON Smart Panel to the buttons on the scanner.

For Windows 98 and 2000 users

Once EPSON TWAIN is installed, the Scanners and Cameras icon appears in Control Panel, and your scanner is listed in the Scanners and Cameras Properties dialog box similar to the one as shown below.



Note for Windows 2000 users:

Screen shots for Windows 98 are used in this section, so they may differ in appearance from what actually appears on your screen. The instructions are the same, except as noted.

For Windows Me users

Once EPSON TWAIN is installed, the Scanners and Cameras icon appears in Control Panel, and your scanner's icon appears in the Scanners and Cameras window. Your scanner's icon is also accessible from My Computer.



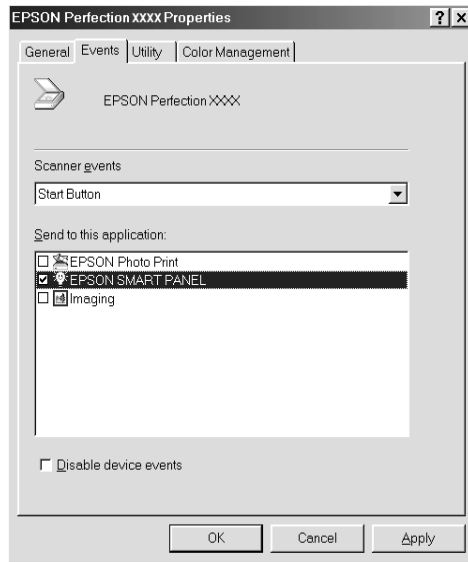
Assigning an application to the buttons

Make sure the application supports "Scanner events" and then follow the steps below. For Windows 98 and 2000 users, see "For Windows 98 and 2000 users" on page 8-11. For Windows Me users, see "For Windows Me users" on page 8-13.

For Windows 98 and 2000 users

1. Click Start, point to Settings, and select Control Panel.
2. Double-click the Scanners and Cameras icon. The Scanners and Cameras Properties dialog box appears.

3. Select your scanner from the installed scanners and cameras list. Click Properties, and then select the Events tab.



4. Select a desired button from the Scanner events list and then select the check box of the desired application in the Send to this application list; clear the rest of the check boxes.

Note:

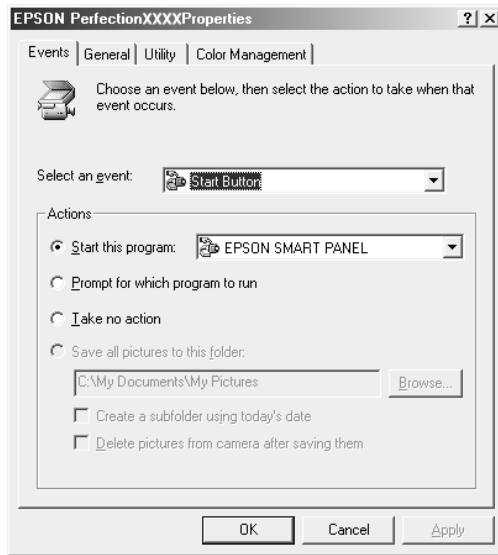
- If multiple applications are selected, when the button is pressed, a dialog box appears to prompt you to select just one from the list.
 - Some applications do not support linkage to scanners and digital cameras. Linkage is available only with the applications that appear in the Send to this application list.
5. To save your settings, click Apply and then OK.

Note:

You need to click Apply whenever you change a button setting.

For Windows Me users

1. Double-click the My Computer icon on the desktop. Or, click Start, point to Settings, and select Control Panel. Double-click the Scanners and Cameras icon in Control Panel.
2. Double-click your scanner's icon and select the Events tab.



3. Select a desired button from the Select an event list. Select Start this program and then select the desired application from the list.

Note:





- ❑ If Prompt for which program to run is selected, when the button is pressed, a dialog box appears to prompt you to select an application from the list.
- ❑ Some applications do not support linkage to scanners and digital cameras. Linkage is available only for applications which appear on the list.

4. To save your settings, click Apply and then OK.

Note:

You need to click Apply whenever you change a button setting.

Disabling the buttons

If you need to disable “Scanner events,” select the Disable device events check box (for Windows 98 and 2000 users), or select Take no action (for Windows Me users) in the EPSON Perfection 1250 or 1650 Properties dialog box. When this check box or setting is cleared, Windows Me, 98, or 2000 can detect if the  Start,  Photo Print,  Scan to E-mail, or the  Scan to Web button on the scanner is pressed and then launch the application you selected from the list.

EPSON Smart Panel

Overview

EPSON Smart Panel allows you to scan and send data directly to an assigned application or the EPSON photo-sharing site with a single press of one of the buttons on the scanner. You can also obtain photos and documents in digital form quickly and easily. When you install the scanner software, EPSON Smart Panel is also installed at the same time. For details, refer to the EPSON Smart Panel documentation.

Note:

- ❑ *For information on the EPSON Smart Panel installation, refer to the Setup Sheet.*
- ❑ *If you plan to scan transparent materials using the (optional) Film Adapter from the EPSON Smart Panel application, refer to the EPSON Smart Panel documentation for details.*

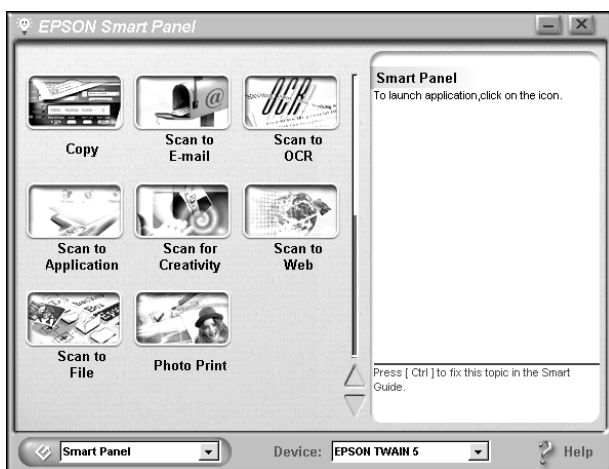
Starting EPSON Smart Panel

Follow the steps below to start EPSON Smart Panel.

1. Click the EPSON Smart Panel shortcut icon on the desktop to start EPSON Smart Panel.



2. The EPSON Smart Panel window appears.





To access an application, click its desired application icon in the window. See “About Applications in the EPSON Smart Panel Window” on page 9-2 for details about the applications available.

About Applications in the EPSON Smart Panel Window

The EPSON Smart Panel window contains various applications. See the following section about the applications available.

The applications can access your scanner. This means by clicking an applications icon, you can use the scanner to scan and then send data directly to the application.

In addition, you can assign any of the available applications to the  Start button on the scanner. See “Assigning an Application in the EPSON Smart Panel Window” on page 9-11 for details. This makes scanning and then sending data to the assigned application even simpler. All you need to do is press the  Start button on the scanner.

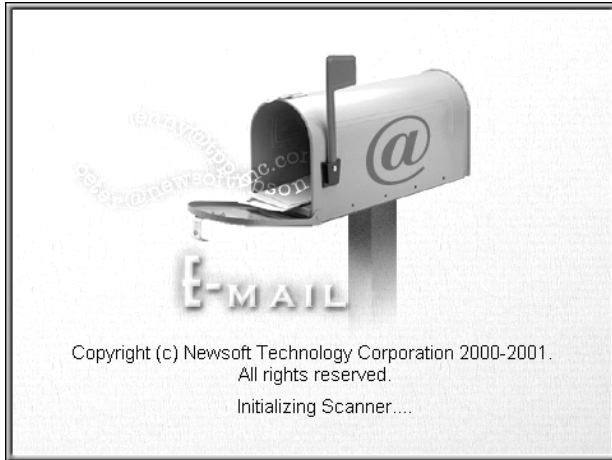
Copy

Use this application to turn your scanner into a digital copy machine. The application looks like a real copy machine, yet its functions are far more powerful and flexible than the conventional copy machines. For details, refer to the EPSON Smart Panel documentation.



Scan to E-mail

Use this application to scan an image and send an e-mail message with your scanned image attached. When you launch this application, the following screen appears. For details, refer to the EPSON Smart Panel documentation.

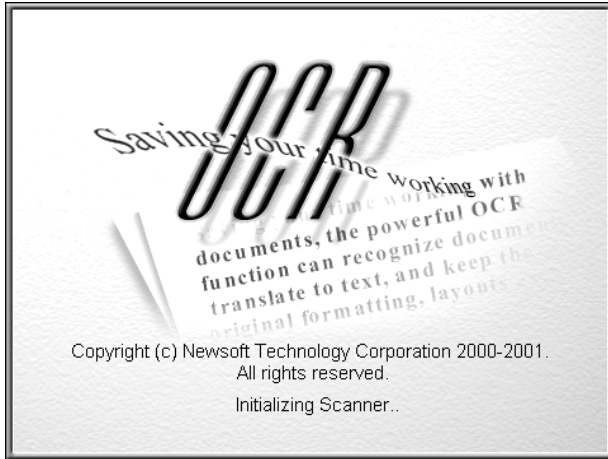


Note:

This application is assigned to the  Scan to E-mail button on the scanner. For details, see "Using the Scan to E-mail button" on page 8-4.

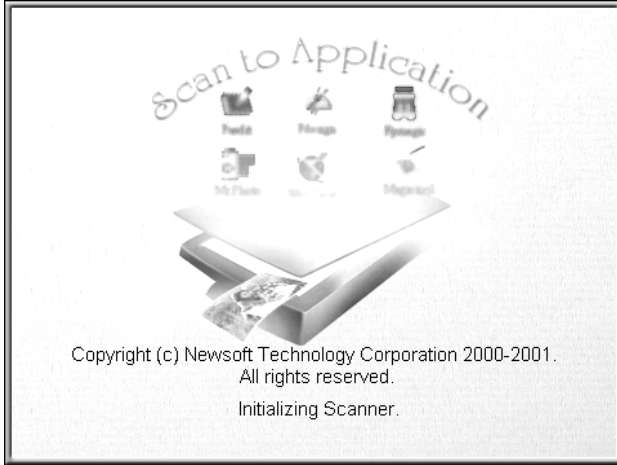
Scan to OCR

Use this application to scan and convert images to text. The converted text can be saved or sent to a word processing application. When you launch this application, the following screen appears. For details, refer to the EPSON Smart Panel documentation.



Scan to Application

Use this application to scan and then send images to a desired application for further editing. When you launch this application, the following screen appears. For details, refer to the EPSON Smart Panel documentation.



Scan for Creativity

Use this application to scan photos and then send the scanned image(s) to ArcSoft PhotoImpression. When you launch this application, the following screen appears. For details, refer to the EPSON Smart Panel documentation.



Note:

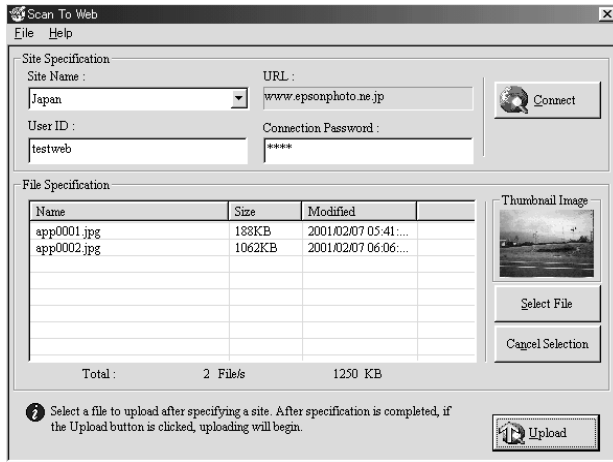
Perfection 1250, 1250 Photo, and Perfection 1650 users can use this application only if ArcSoft PhotoImpression is installed; if it is not installed, the Scan for Creativity icon appears dimmed and is not available.

Note for Perfection 1650 Photo users:

This application is not displayed and is not available.

Scan to Web

Use this application to scan an image and then upload it to the EPSON photo-sharing site. When you launch this application, an image is scanned from EPSON TWAIN and displayed in the Verify Assistant dialog box. Click Finish and the following dialog box appears. Click Upload to upload the image. For details, refer to the EPSON Smart Panel documentation.



Note:

This application is assigned to the  Scan to Web button on the scanner. For details, see “Using the Scan to Web Button” on page 8-7.

Scan to File

Use this application to scan, convert and then save the scanned image to a specific folder. When you launch this application, an image is scanned from EPSON TWAIN and displayed in the Verify Assistant dialog box. Click Finish and the following dialog box appears. For details, refer to the EPSON Smart Panel documentation.

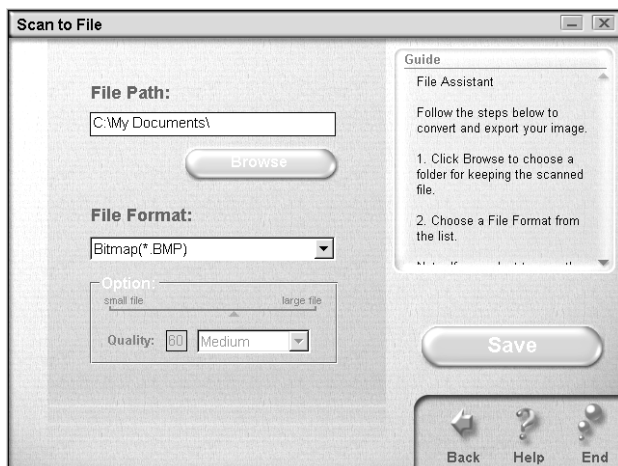



Photo Print

Use this application to scan and then print images as photos. You can print in various sizes, or place several photos on the same page. You can also create collages or print several versions of the same image easily. For details, refer to the EPSON Smart Panel documentation.



Note:

This application has been assigned to the  Photo Print button on the scanner. For details, see "Using the Photo Print Button" on page 8-3.

Photoshop (for Perfection 1650 Photo users)

Use this application to launch Adobe Photoshop. For details, refer to the EPSON Smart Panel documentation.

Note for Perfection 1650 Photo users:

This application can be used only if Adobe Photoshop is installed; if it is not installed, the Photoshop icon appears dimmed and is not available.

Note for Perfection 1250/1250 Photo/1650 users:


This application is not displayed and is not available.

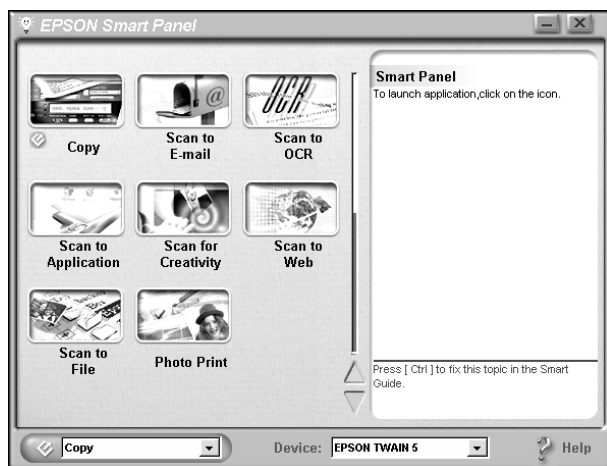
Assigning an Application in the EPSON Smart Panel Window


To assign an application in the EPSON Smart Panel window to the  Start button on the scanner, follow the steps below.

1. Click the EPSON Smart Panel shortcut icon on the desktop to start EPSON Smart Panel.





2. Select an application from the EPSON Smart Panel list box or click the  Start button at the lower left corner.



The selected application is assigned to the  Start button.

Note:

The application currently assigned to the  Start button on the scanner has the  Start button icon added to its application icon.

Maintenance

Cleaning the scanner

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

1. 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 white spots in your scanned image.



Caution:

- ❑ *Do not place heavy objects on the glass of the document table. Also, do not press the glass of the document table with too much force.*
- ❑ *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.*
- ❑ *Do not spray lubricants inside the scanner.*
- ❑ *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 the indicator light turns on in red (for Perfection 1250 users) or flashes red (for Perfection 1650 users). 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 lock the scanner's carriage to prevent damage. Follow the steps below.

1. Plug in the scanner and wait until the carriage moves to the home position (position nearest the cover hinges). When the indicator light stays on in green, unplug the power cord.
2. Disconnect the AC adapter from the DC inlet, and then slide the transportation lock to the left.

Note for Perfection 1650 users:

If you are using the optional Film Adapter and it is switched on, the carriage will not move to the home position. Remove the optional Film Adapter first, then perform the steps above.

Upgrading from Windows 98 to Windows Me or 2000

If you are using your scanner with a computer running Windows 98 and are planning to update your system to Windows Millennium Edition (Windows Me) or 2000, follow the instructions below.

If EPSON TWAIN is already installed, you need to uninstall it, upgrade the system to Windows Me or 2000, and then re-install it, as follows:

1. Uninstall EPSON TWAIN before updating your system. See "Uninstalling EPSON TWAIN" on page 10-4.
2. After uninstalling EPSON TWAIN, turn off the computer, and make sure the scanner is unplugged and disconnected from the computer.
3. Turn on the computer and install Windows Me or 2000.

4. Make sure that Windows Millennium Edition or 2000 is installed correctly, and then shut down your computer.
5. Install EPSON TWAIN and connect the scanner following the instructions in your *Setup Sheet*.

Note:

To connect your scanner via the USB interface, your computer must have been purchased with Windows Millennium Edition, 2000, or 98 pre-installed.

Uninstalling EPSON TWAIN

Follow the steps below to uninstall EPSON TWAIN. For Windows Me or 98 users, see “For Windows Me or 98 users” on page 10-4. For Windows 2000 users, see “For Windows 2000 users” on page 10-6.

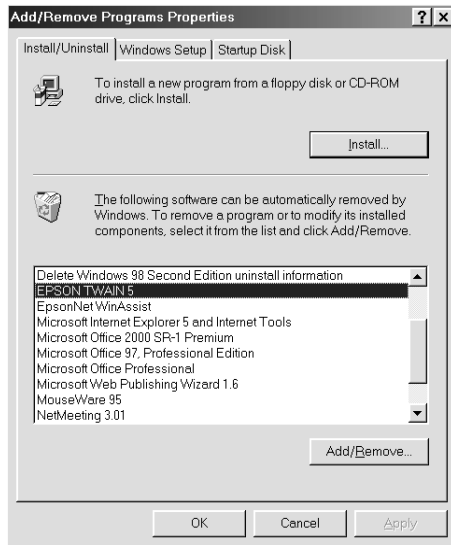
Note:

You can also uninstall EPSON TWAIN from the EPSON Installation Program dialog box. To view the dialog box, insert the scanner software CD in the CD-ROM drive.

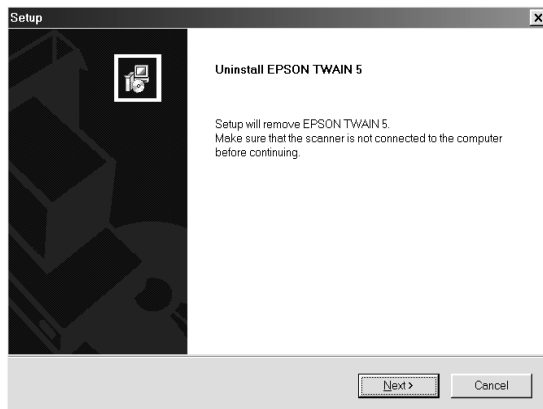
For Windows Me or 98 users

1. Unplug the scanner and disconnect the scanner from the computer.
2. Click Start and point to Settings, then select Control Panel.
3. Double-click the Add/Remove Programs icon in Control Panel.

4. Select EPSON TWAIN 5 from the list, then click Add/Remove.



5. The confirming dialog box appears. Click Yes to continue.
6. The following window appears. Click Next.



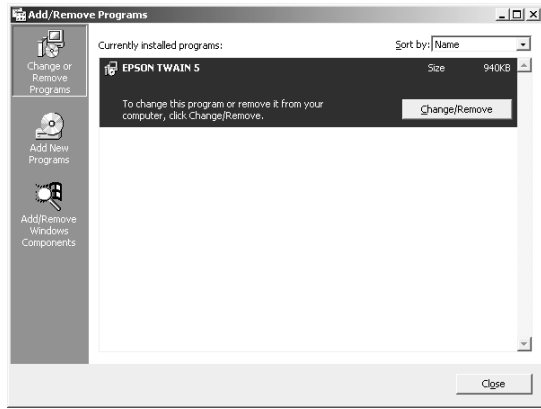
7. Click Finish to complete the uninstallation. In some cases, a message may appear to prompt you to restart the computer; make sure Yes, I want to restart my computer now is selected and then click Finish.

For Windows 2000 users

You need to remove your scanner from the Scanners and Cameras dialog box first and then uninstall EPSON TWAIN. Follow the steps below.

1. Make sure your scanner is plugged in and connected to your computer.
2. Click Start and point to Settings, then select Control Panel.
3. Double-click the Scanners and Cameras icon in Control Panel.
4. Remove your scanner from the list of installed devices.
5. Unplug the scanner and disconnect the scanner from the computer.
6. Double-click the Add/Remove Programs icon in Control Panel.

7. Select EPSON TWAIN 5 from the list, then click Change/Remove.



8. Follow the instructions described in “For Windows Me or 98 users” on page 10-4 (steps 5 to 7).

Problems and Solutions

Most problems you encounter while operating your scanner and software have simple solutions. This section helps you identify the cause of the problem and provides you with solutions. It is divided into the following categories:

Error indicator	page -9
Scanner operation problems . . .	page -9
Software operation problems . . .	page -12
Scanning problems	page -13
Quality problems	page -16
Color matching problems	page -18

Read the appropriate section to find your problem; then follow the recommended steps.

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. For information on contacting customer support in your area, see "Overview" on page A-1.

Note:

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

Error indicator

If an error occurs, the scanner stops operating and the indicator light indicates the error as described below.

Scanner Type	Color of Light	Pattern of Light
Perfection 1250	Red	On
Perfection 1650		Flashing

The error indicates one of the following problems:

- The fluorescent lamp needs to be replaced.
- The scanner is malfunctioning.

Consult your dealer. After the problem is cleared, unplug the scanner and the USB cable, and then plug them back in.

Scanner operation problems

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

- Incorrect setup of the interface (see your *Setup Sheet*).
- Incorrect setup of your computer or software (see your *Setup Sheet*).
- Incorrect operation of your software (see your software documentation).

Also see the documentation that came with your computer and scanner for possible solutions.

The fluorescent lamp does not turn on.

- ❑ Make sure the AC adapter is connected to the scanner and the power cord is plugged into an electrical outlet.
- ❑ **For Perfection 1250 users:**
The fluorescent lamp turns off if you unplug the USB cable, and turns on again if you connect the USB cable.
- ❑ **For Perfection 1650 users:**
If the scanner does not receive any commands after 15 minutes, it turns off the lamp. The lamp will turn back on when you scan.

The scanner does not scan.

- ❑ Wait until the indicator light stays on in green (ready for scanning).
- ❑ Try connecting the scanner directly to the computer's USB port, or use an EPSON USB cable.
- ❑ If you connect the scanner through more than one hub, your system may not work properly. In this case, try connecting the scanner directly to the computer's USB port. Also, your system may not work properly if you use a USB cable other than that supplied by EPSON.

You cannot scan from the Film Adapter.

- ❑ Make sure the (optional) Film Adapter is installed correctly. For Perfection 1250 users, see "Installing the Film Adapter" on page 3-2. For Perfection 1650 users, see "Installing the Film Adapter" on page 3-21.
- ❑ Make sure Document Source is set to TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film depending on the film type, in the Manual mode window.

- ❑ Make sure the document source in the customizing menu for the Full Auto mode is not set to Reflective. See “Customizing the Full Auto Mode Settings” on page 2-14 for details.
- ❑ **For Perfection 1650 Photo users:**
Make sure the reflective document mat is removed when you scan transparent materials. See “Removing and attaching the reflective document mat” on page 3-9 for details.

Pressing the button on the scanner does not start scanning.

- ❑ Make sure EPSON Smart Panel is installed and the EPSON Smart Panel’s Launch Application path is set correctly.
- ❑ **For Windows 98 and 2000 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 desired button is selected as the Scanner events, and at least one scanner event recognizable application in the Send to this application list is selected.
- ❑ **For Windows Me users:**
Click the Events tab in your scanner's Properties dialog box and make sure Take no action is not selected. Also, make sure the desired button is selected in the Select an event list box, and the desired application is selected from the Start this program list.

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 operation problems

You cannot start EPSON TWAIN.

- ❑ Plug in the scanner and then turn on the computer.
- ❑ Unplug the scanner and turn off the computer. Then check the connection between the scanner and the computer.
- ❑ Make sure that EPSON TWAIN is selected in your application software.
- ❑ Make sure your software is installed correctly.
- ❑ **For Windows 2000 users:**
In the Device Manager menu, make sure your scanner's name appears under Imaging devices hardware type without a question (?) or an exclamation (!) mark. If the scanner appears with a question (?) or an exclamation (!) mark, or as an Unknown devices hardware type, remove it while the scanner is still connected and plugged in. Then reinstall EPSON TWAIN. See your *Setup Sheet* for details.

The scanner software does not work properly.

- ❑ Make sure your software is installed correctly.
- ❑ **For Windows 98 and 2000 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 from the list of installed devices, then reinstall EPSON TWAIN following the instructions in your *Setup Sheet*.

❑ **For Windows Me users:**

Check if your scanner's icon appears more than one. To check the icon, double-click the My Computer icon on the desktop or double-click the Scanners and Cameras icon in Control Panel. Remove your scanner's icon in the window, then reinstall EPSON TWAIN following the instructions in your *Setup Sheet*.

- ❑ Make sure your computer meets the memory and other system requirements specified for the software you are using.
- ❑ Make sure the computer has enough memory for your software. If the computer does not have enough memory available, see your software and computer documentation for details.

You cannot select optional equipment (Film Adapter).

Make sure the optional equipment is installed correctly. For Perfection 1250 users, see "Installing the Film Adapter" on page 3-2. For Perfection 1650 users, see "Installing the Film Adapter" on page 3-21.

Scanning problems

Edges of the document are not scanned.

- ❑ Make sure a document is aligned to the Alignment Mark. See "Placing a Document on the Scanner" on page 2-4.
- ❑ **For Perfection 1250 users:**
Position the document so the area you want to scan is within the edge guide limits of the document table. The area with a width of maximum 5 mm from both the horizontal and vertical guides is not scanned.

❑ **For Perfection 1650 users:**

Position the document so the area you want to scan is within the edge guide limits of the document table. Note that an area 2 mm from the horizontal guide and 1.5 mm from the vertical guide will not be scanned.

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

- ❑ Make sure a document is placed on the document table of the scanner.

❑ **For Perfection 1650 users:**

Change the Threshold setting in the Image Control dialog box. When Text (Background Removal) is selected as the Image Type, change Text Enhancement Technology to None from the B/W Option in the Image Type dialog box. Then change the Threshold setting in the Image Controls dialog box. Or change Text (Background Removal) to Text/Line Art, then change the Threshold setting in the Image Control dialog box.

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.

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.

You cannot scan the film from the Full Auto mode or the Thumbnail preview.

- ❑ Make sure the film and the film holder are set correctly.
- ❑ Switch to the Manual mode and use a marquee. In the Manual mode window, click the Configuration button and clear the Automatic Thumbnail Preview for Film check box. Select Document Source (TPU: Color Neg. Film, TPU: Monochrome Neg. Film, or TPU: Pos. Film depending on the type of film you are scanning) and then click the  Full Preview button. In the Preview window, click and drag the mouse over the area you want to see in detail, and click the  Zoom Preview button. For information on marquee, see “Using a marquee” on page 5-5.

The colors of negative film preview images look strange.

- ❑ In the Manual mode window, make sure Document Source is set to TPU: Color Neg. Film when you scan color negative film, or TPU: Monochrome Neg. Film when you scan monochrome negative film.

- ❑ When previewing images without using the Thumbnail preview in the Manual mode, the dark area around the film, such as the frame of the film holder, is perceived as white, which alters the exposure of the scanning area and causes scans to appear darker. See the correct color by clicking and dragging the mouse pointer over an area, and then clicking the  Zoom Preview button.

Scanned image by using the button is missing.

Make sure desired application is assigned to the button.

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.

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.
- ❑ Adjust your software's Gamma setting. See "Adjusting the Gamma setting" on page 6-5.

The image is too dark.

- ❑ Check your software's Brightness setting. See "Adjusting Brightness and Contrast" on page 6-2.
- ❑ Check the brightness and contrast settings of your computer display.

Image is dark, with little or no detail.

- ❑ Change the Display Gamma setting. See "Display Gamma" on page 7-5.
- ❑ Change the Destination setting. Select Screen/Web as the destination in the Manual mode window. See "Selecting a Destination" on page 4-13. Selecting a printer may cause on-screen colors to be different from the colors of the original, however colors will be reproduced correctly when it is printed.

Scanned image is too large.

Change the image size setting in the Manual mode window.

Moiré (cross-hatch) patterns appear in the scanned image.

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

- ❑ Make sure Image Type is set to Color Document or Black & White Document in the Manual mode window.
- ❑ Change the Image Type settings. Turn the De-screening setting On in the Image Type dialog box.
- ❑ Place a transparent sheet such as an overhead projector sheet, between the document and the document table.
- ❑ Reposition the document slightly.
- ❑ Make the image size slightly smaller.

Poor character recognition during OCR scanning.

- ❑ Try adjusting the Threshold setting in the Image Controls dialog box.
- ❑ Select Text Enhancement Technology from B/W Option in the Image Type dialog box to eliminate background noise.
- ❑ **For Perfection 1650 users:**
Change the Image Type setting. Select Text (Background Removal) as “Selecting an Image Type” on page 4-5.
- ❑ See “Optimizing Text Scanning for OCR” on page 6-18 for more information.

Color matching problems

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.

Colors differ from the original.

- ❑ Change the Display Gamma setting. See “Display Gamma” on page 7-5.
- ❑ Change the Image Type setting. See “Selecting an Image Type” on page 4-5 to make sure your settings are 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).

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.

Contacting Customer Support

Overview

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. If customer support for your area is not listed below, 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

Technical Specifications

System Requirements

Before installing the scanner software, make sure that your system meets the following requirements.

For PCs

System	Microsoft® Windows® 98 pre installed, Windows® Me pre installed or upgraded from Windows 98 pre installed model, Windows® 2000 pre installed or upgraded from Windows 98 pre installed model
Interface	The computer's USB port (TYPE A receptacle)
Display	VGA or higher resolution monitor 640 × 480 screen resolution (800 × 600 or higher recommended), and 65,000 color (or higher) Note: <i>Color and tone reproduction are subject to the display capability of your computer system, including the video card, display monitor, and software. See the product documentation for details.</i>

For Macintosh computers

System	USB-equipped Macintosh® with Mac OS® 8.5 or later
Interface	Macintosh USB

Display	<p>Color Monitor, 640 × 480 screen resolution (or higher recommended), and 32,000 color (or higher)</p> <p>Note: <i>Color and tone reproduction are subject to the display capability of your computer system, including the video card, display monitor, and software. See the product documentation for details.</i></p>
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Scanning

Perfection 1250

Scanner type	Flatbed, color
Photoelectric device	Color CCD line sensor
Effective pixels	10200 × 14040 pixels at 1200 dpi, 100%
Document size	216 mm × 297 mm (8.5 inches × 11.7 inches) A4 or US letter size (The reading area can be specified from your software.)
Scanning resolution	1200 dpi (main scan) 2400 dpi with Micro Step (sub scan)
Output resolution	50 dpi to 9600 dpi (50 to 4800 dpi in 1 dpi increments, 7200 dpi, and 9600 dpi.)
Image data	16 bits per pixel per color internal 8 bits per pixel per color external
Line Art settings	Fixed threshold
Gamma correction	1 type for user-defined
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)
Interface	USB (Type B Receptacle Connector)

Light source	White cold cathode fluorescent lamp
Reliability	10,000 cycles of carriage movements (main unit MCBF)
Dimensions	Width: 278 mm (10.9 inches) Depth: 438 mm (17.2 inches) Height: 67 mm (2.6 inches)
Weight	Approx. 2.5 kg (5.5 lb)

Perfection 1650

Scanner type	Flatbed, color
Photoelectric device	Color CCD line sensor
Effective pixels	13600 × 18720 pixels at 1600 dpi, 100%
Document size	216 mm × 297 mm (8.5 inches × 11.7 inches) A4 or US letter size (The reading area can be specified from your software.)
Scanning resolution	1600 dpi (main scan) 3200 dpi with Micro Step (sub scan)
Output resolution	50 dpi to 12800 dpi (50 to 6400 dpi in 1 dpi increments, 9600 dpi, and 12800 dpi. 9600 dpi and 12800 dpi performed with zoom function)
Color separation	RGB color filters on CCD
Zoom	50% to 200% in 1% increments
Image data	16 bits per pixel per color internal 16 bits per pixel per color external
Brightness	7 levels (In EPSON TWAIN, Gamma correction controls Brightness)
Line Art settings	Fixed threshold Text Enhancement Technology (enable/disable selectable)

Halftoning process	AAS (Auto Area Segmentation) Enable/disable selectable 3 halftoning modes (A, B, and C) and 4 dither patterns (A, B, C, and D) for bi-level and quad-level data (2 downloadable dither patterns)
Gamma correction	2 types for CRT display 3 types for printer 1 type for user-defined
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)
Interface	USB (Type B Receptacle Connector)
Light source	White cold cathode fluorescent lamp
Reliability	10,000 cycles of carriage movements (main unit MCBF)
Dimensions Perfection 1650	Width: 276 mm (10.9 inches) Depth: 450 mm (17.7 inches) Height: 93 mm (3.7 inches)
Dimensions Perfection 1650 Photo	Width: 276 mm (10.9 inches) Depth: 450 mm (17.7 inches) Height: 116mm (4.6 inches)
Weight Perfection 1650	Approx. 2.6 kg (5.7 lb)
Weight Perfection 1650 Photo	Approx. 3.1 kg (6.8 lb)

Electrical

Perfection 1250

Input voltage range	DC 15.2 V
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Rated current	1.2 A
Power consumption	Approx. 18 W

Note:

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

Perfection 1650

Input voltage range	DC 24 V
Rated current	0.8 A
Power consumption	Perfection 1650: Approx. 15 W Perfection 1650 Photo: Approx. 17 W

Note:

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

ENERGY STAR Compliance



As an ENERGY STAR® Partner, EPSON has determined that this product meets the ENERGY STAR guidelines for energy efficiency.

The International ENERGY STAR Office Equipment Program is a voluntary partnership with the computer and office equipment industry to promote the introduction of energy-efficient personal computers, monitors, printers, fax machines, copiers, and scanners, in an effort to reduce air pollution caused by power generation.

AC Adapter

Perfection 1250

Input	AC 100 - 120 V, 50-60 Hz	AC 220 - 240 V, 50-60 Hz
Output	DC 15.2 V, 0.5 A (Max. 0.9 A)	DC 15.2 V, 0.3 A (Max. 0.5 A)
Temperature	5 to 35°C (41 to 95°F)	5 to 35°C (41 to 95°F)

Perfection 1650

Input	AC 100 - 120 V, 50-60 Hz	AC 220 - 240 V, 50-60 Hz
Output	DC 24 V, 0.7 A (Max. 1.0 A)	DC 24 V, 0.4 A (Max. 0.65 A)
Temperature	5 to 35°C (41 to 95°F)	5 to 35°C (41 to 95°F)

Environmental

Temperature:

Operation	5 to 35°C (41 to 95°F)
Storage	-25 to 60°C (-13 to 140°F)

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

Scanner

U.S. model:

EMC	FCC Part 15 Subpart B Class B CSA C108.8 Class B
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European model:

EMC Directive 89/336/EEC	EN 55022 Class B EN 55024
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Australian model:

EMC	AS/NZS 3548 Class B
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AC adapter

U.S. model:

Safety	UL 1950 UL 1310 CSA C22.2 No. 950, No. 223
EMC	FCC Part 15 Subpart B Class B CSA C108.8 Class B

European model:

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

Safety	AS/NZS 3260
EMC	AS/NZS 3548 Class B

USB Interface

Perfection 1250

Interface type: Universal Serial Bus Specification Revision 1.1

Electrical standard: Full Speed mode(12 Mbit/s) of Universal Serial Bus Specification Revision 1.1.

Connector type: One receptacle (Type B)

Configuration:

Element	Description
Device	Full Speed mode (12 Mbit/s) Class: Vendor-specific Vendor ID: 0x04B8 (Seiko Epson Corp.) Product ID: 0x010F
Configuration	Characteristics: Self-powered. Remote wake up feature is not supported. Maximum power consumption from VBUS: 2 mA (5 V)
Interface	No alternate setting Class: Vendor specific
Endpoint for Bulk IN	Maximum data transfer size: 64 byte
Endpoint for Bulk OUT	Maximum data transfer size: 64 byte
String Descriptor	Language ID: US English 1: Manufacturer: "EPSON" 2: Product: "EPSON Scanner 010F"

Perfection 1650

Interface type: Universal Serial Bus Specification Revision 1.1

Electrical standard: Full Speed mode(12 Mbit/s) of Universal Serial Bus Specification Revision 1.1.

Connector type: One receptacle (Type B)

Configuration:

Element	Description
Device	Full Speed mode (12 Mbit/s) Class: Vendor-specific Vendor ID: 0x04B8 (Seiko Epson Corp.) Product ID: 0x0110
Configuration	Characteristics: Self-powered. Remote wake up feature is not supported. Maximum power consumption from VBUS: 2 mA (5 V)
Interface	No alternate setting Class: Vendor specific
Endpoint for Bulk IN	Maximum data transfer size: 64 byte
Endpoint for Bulk OUT	Maximum data transfer size: 64 byte
String Descriptor	Language ID: US English 1: Manufacturer: "EPSON" 2: Product: "EPSON Scanner"

Initialization Methods

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

Hardware initialization	The scanner is plugged in. The USB cable is unplugged from the USB port on the scanner.
Software initialization	Software sends the ESC @ (initialize the scanner) command. The scanner receives a Bus Reset from the USB interface.

Integrated TPU for the Perfection 1650 Photo

Model: EU-54

Electrical Specifications:

Supplied Voltage: DC 24 V

Rated current: 0.3 A

Environmental Conditions:

Temperature Operation: 5°C to 35°C (41°F to 95°F)
 Storage: -25°C to 60°C (-13°F to 140°F)

Humidity Operation: 10% to 80%, without
 condensation
 Storage: 10% to 85%, without
 condensation

Document:

Transparencies 35-mm film strip
up to 35-mm slide

Readable area: 36 × 226 mm

Film Adapter (Option)

For the Perfection 1250

This product conforms to CE marking requirements in accordance with EC Directive 89/336/EEC.

Model: EU-52

Electrical Specifications:

Supplied Voltage: DC 15.2 V

Rated current: 0.4 A

Environmental Conditions:

Temperature Operation: 5°C to 35°C (41°F to 95°F)
Storage: -25°C to 60°C (-13°F to 140°F)

Humidity Operation: 10% to 80%, without
condensation
Storage: 10% to 85%, without
condensation

Document:

Transparencies 35-mm film strip
up to 35-mm slide

Readable area: 36 × 36 mm

Dimensions: Width: 88 mm (3.5 inches)
Depth: 145 mm (5.7 inches)
Height: 56 mm (2.2 inches)

Weight: Approx. 170 g (0.4 lb)

For the Perfection 1650

Model: EU-33

Electrical Specifications:

Supplied Voltage: DC 24V

Rated current: 0.5 A

Environmental Conditions:

Temperature Operation: 5°C to 35°C (41°F to 95°F)
Storage: -25°C to 60°C (-13°F to 140°F)

Humidity Operation: 10% to 80%, without
condensation
Storage: 10% to 85%, without
condensation

Document:

Transparencies 4 × 5 inches film
up to 35-mm film strip
 35-mm slide
 120/220 size (6 cm × 9 cm) film strip
 4 × 5 inches film

Manuscript: Up to 4 × 5 inches film size

Readable area: 93 × 118 mm

Dimensions: Width: 222 mm (8.7 inches)
 Depth: 305 mm (12.0 inches)
 Height: 36 mm (1.4 inches)

Weight: Approx. 700 g (1.5 lb)

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.

application

A software program that helps you carry out a particular task, such as word processing, image editing, or financial planning.

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.

ColorSync

Color management system for Macintosh that is designed to help you get WYSIWYG (what you see is what you get) color output. This software displays colors on your screen as they are on the scanned documents, or prints colors as you see them on your screen.

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.

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.

exposure

A scanner function that lightens or darkens the scanned image data.

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.

ICM

Image Color Matching. Windows color management system designed to help you get WYSIWYG (what you see is what you get) color output. This software displays colors on your screen as they exist on the scanned documents, or prints colors as you see them on your screen.

imagesetter

A device that uses computer files to produce high-resolution text and graphics output on film or paper. These are usually found in service bureaus and printing companies.

impact dot printer

A printer that transfers ink onto the paper by striking an ink ribbon with a number of small pins.

ink jet printer

A printer that transfers ink onto the paper by spraying the ink through a number of small nozzles.

interface

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

laser printer

A printer that uses a laser and the electrophotographic method to print a full page at a time. The laser is used to “paint” a charged drum with light, to which toner is applied and then transferred onto paper.

line sequence

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

marquee

A moveable and adjustable frame that marks the area of an image that will be previewed or scanned.

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.

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.

sRGB

A standard color space used as the default color space within the Windows 98 color management system (ICM 2.0).

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.

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.

USB

A Universal Serial Bus. A hardware interface for connecting low-speed peripherals such as a keyboard, mouse, scanner, or printer to the computer.

USB hub

A device that normally provides four TYPE A sockets to increase the number of USB ports on a PC.

