ISIS® Driver for

EPSON GT-30000
Color Image Scanner

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Introduction

ISIS® (Image and Scanner Interface Specification), is an industry standard way of controlling a scanner and transferring the data it outputs into a computer system. ISIS consists of a system of software modules, each of which performs a specific imaging-related function. For application developers, ISIS provides a robust and consistent interface for the integration of scanners into applications. Because ISIS is an industry standard, users of ISIS scanner drivers can be confident that the hardware they have purchased will be supported by a wide variety of compatible applications.

This guide explains how to set up and use Pixel Translations' ISIS driver for the EPSON GT-30000 color image scanner. The instructions are by necessity somewhat generic and describe a typical use of the driver by an ISIS application. Illustrations, descriptions, and instructions refer to the built-in user interfaces available in the ISIS driver. However, developers of ISIS applications have the freedom to create their own user interfaces and bypass the built-in ones. Therefore, appearance and operation of the scanner within your application may differ from the descriptions provided in this guide.

System Requirements

Operating System

The EPSON GT-30000 is designed and tested to work with Microsoft Windows 95, Windows 98, Windows Me, Windows NT 4.0, and Windows 2000.

Host Interface

The EPSON GT-30000 has a SCSI interface only and requires the computer to have a properly installed SCSI host adapter. The EPSON GT-30000 has been tested with Adaptec model 154x, 294x, and 2906 SCSI host adapters.

EPSON Scanner Driver Installation

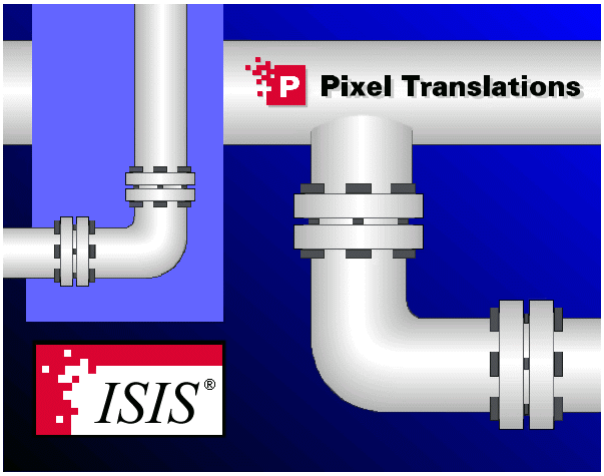
This section explains how to install the driver from the installation media included with your scanner. Follow these steps to install the driver:

1. Put the EPSON scanner driver installation diskette or CD-ROM into the appropriate drive.

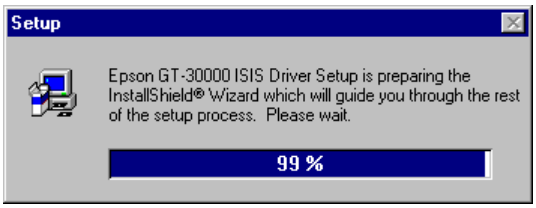
2. From Microsoft Windows or Windows NT, choose **Run** from the **Start** menu.

3. In the **Run** dialog box **Command Line** edit box, type `a:\setup.exe` (substituting the correct drive letter for your diskette or CD-ROM drive), then click **OK**. In a few moments, the **Choose Setup Language** dialog box appears:

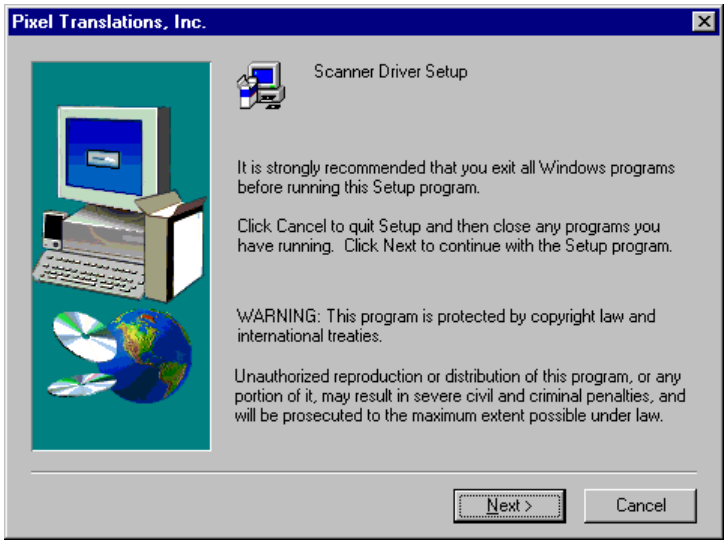
4. Choose the desired language for setting up the driver, then click **OK**. The following introductory screen appears:



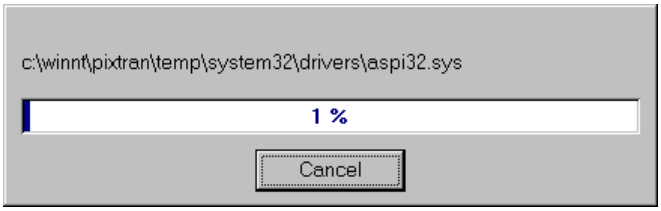
The following progress indicator also appears as Setup creates the installation files:



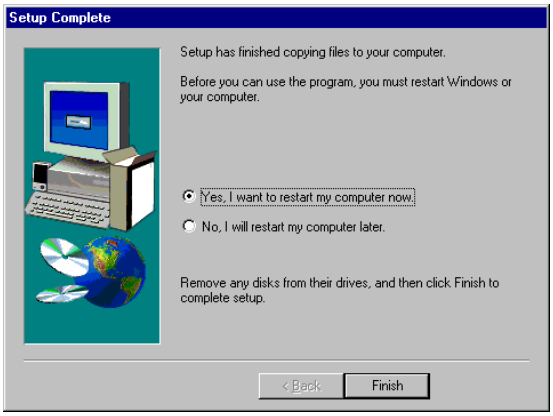
In a few moments, the first Setup dialog box appears:

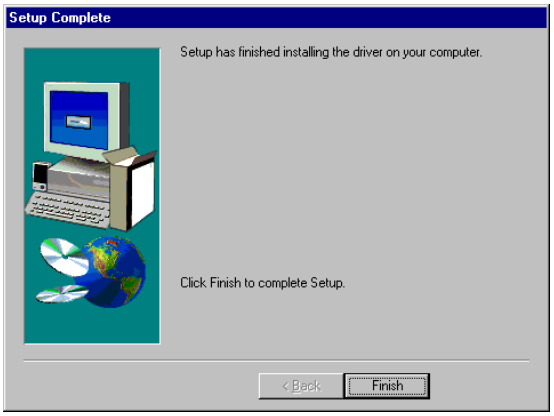


5. Close any other programs that may be running, then click **Next**. Setup copies the necessary files to their proper locations. During this process, the following progress indicator appears briefly:



When Setup is finished copying files, one of the following dialog boxes appears:



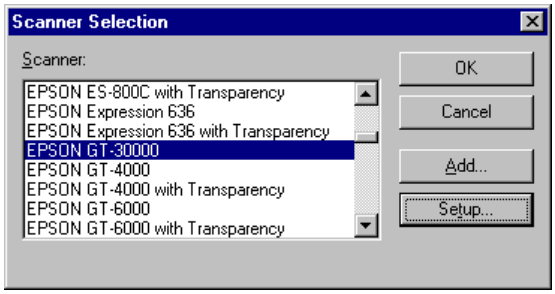


6. If Setup instructs you to reboot your computer, you must do so before using the driver. Click **Finish** to close Setup.

Scanner driver setup is complete.

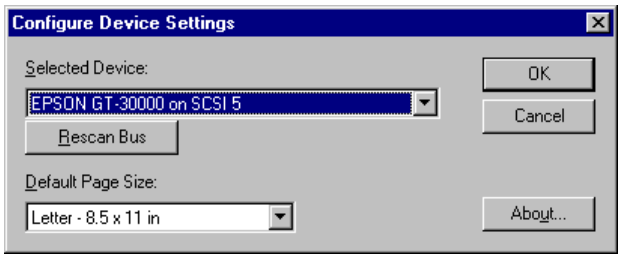
Scanner Selection

Most ISIS applications enable you to select the scanner to use from among all scanners whose drivers you have installed. Scanner selection is often accomplished by a File menu command. If the application uses the built-in ISIS user interface for scanner selection, you should see a dialog box similar to this:



1. Locate the EPSON GT-30000 and click to select it.

2. Click **Setup**. The **Configure Device Settings** dialog box appears. (If you have never before set up this scanner, the **Configure Device Settings** dialog box also appears if you click **OK**.)



   The driver attempts to locate the scanner on the SCSI bus. If successful, it displays the scanner's SCSI address in the **Selected Device** box.

   If the scanner was not properly connected or was not turned on when you clicked **Setup**, correct the problem and then click **Rescan Bus**. When the driver succeeds in locating the scanner, its SCSI address appears in the **Selected Device** box.

3. Choose the page size you most often will scan from the **Default Page Size** list. Note that you can change the page size to any available size at any time while using the scanner—this is the setting the scanner will use by default.

4. Click **OK** to close the **Configure Device Settings** dialog box.

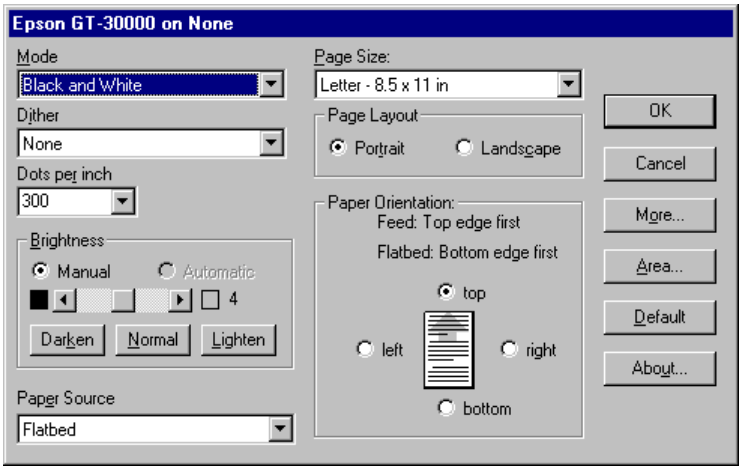
Scanner selection is complete.

Scanner Settings

This section explains scanner settings. As previously mentioned, your application may use the built-in ISIS user interface or may have a custom interface. This section covers the built-in interface. A well-designed custom interface should include the same options, but they may be arranged in a different manner.

Standard Scanner Settings Dialog Box

When you choose the **Scanner Settings** command in your application, a dialog box similar to the following appears.



Note

In some applications, some of these controls may appear in the **Advanced Settings** dialog box that appears when you click **More**.

Mode (Color Mode)

Choose the desired color mode from this drop-down list box. The choices available include:

Black and White — All colors and shades in the image are represented by either a black pixel or a white pixel. The brightness and contrast controls determine the point at which a particular shade is represented as black or white. Optionally, dithering can be enabled to simulate shades of gray. This mode uses one bit per pixel.

256-Level Gray — All colors and shades in the image are represented by 254 shades of gray plus black and white. This mode uses 8 bits per pixel.

24-Bit Color — All colors and shades in the image are represented by eight shades of red, eight shades of blue, and eight shades of green. These can be combined to provide 16,777,216 colors (2^{24}), including black and white. This mode uses 24 bits per pixel.

Dither

Dithering is the process of simulating shades of gray using only black and white pixels. It is similar to halftoning used in newspapers and magazines, where clusters of black and white dots represent various shades of gray.

The EPSON GT-30000 has several different built-in dither patterns as well as two user-definable, downloadable dither patterns. Dither patterns are designed to apply a different threshold value to each pixel, so as to avoid repetitive patterns (aliasing) in the scanned image. To determine the dither pattern that best meets your needs, try each one on samples of your pages and use the one that gives the most pleasing results. Generally you will use dithering when scanning photographs, but not when scanning text.

Note

Dithering usually increases the size of the compressed images, sometimes making them bigger than their uncompressed counterparts.

Choose the desired dithering pattern from this drop-down list box. (If the box is dimmed, then dithering is not available in the selected color mode.)

None	No dithering. Recommended setting for scanning text and line art.
Dither Mode A	4 x 4 Bayer dither pattern
Dither Mode B	4 x 4 Spiral dither pattern
Dither Mode C	4 x 4 Net screen dither pattern
Dither Mode D	8 x 8 Net screen dither pattern
Download Pattern A **Download Pattern B**	To download a dither pattern, click **More** to display the **Advanced Settings** dialog box. **Note:** If you choose one of these pattern but no dither pattern has been downloaded, the scanner will use the 4 x 4 Bayer pattern.

Dots per inch

Choose the desired scanning resolution from this drop-down list box. You can choose values between 50 and 2400 dpi. The higher the number of dots-per-inch, the larger will be the resulting image files. A 300 dpi image has 90,000 dots per square inch; a 200 dpi image is less than half the size at 40,000 dots per square inch. Scanning at 2400 dpi will produce huge files that contain almost six million dots per square inch. If you use this resolution, you might run out of disk space (and time) before a normal-sized image has been scanned. Normally you should choose the lowest resolution that gives the desired results and readability.

Brightness

Choose the desired brightness setting by using the **Brightness** controls. The EPSON GT-30000 has seven levels of manual brightness control, as well as three preset levels: **Normal**, **Darken**, and **Lighten**. The three preset levels are set in the scanner driver to provide somewhat consistent results on many different scanner models, so the **Normal** setting is not always in the middle of the available range. This scanner does not have an automatic brightness capability. To determine the best setting for your documents requires scanning, changing the setting, then rescanning until you achieve the desired results.

In addition, when scanning in Black and White mode, you can adjust the **Threshold** setting in the **Advanced Settings** dialog box (page 8). Because a binary image does not have a brightness associated with it, pixels either being completely white or completely black, the Threshold control adjusts the gray level at which the scanner switches a pixel from white to black. The scanner provides 256 Threshold settings.

Paper Source

Choose the desired paper source from the **Paper Source** list.

Automatic	Scan from the feeder if pages are present; otherwise, scan from the flatbed.
Flatbed	Scan from the flatbed only, regardless of whether or not pages are present in the feeder.
Feeder	Scan from the feeder if pages are present; otherwise display a message.
Duplex	Scan both sides of each page in the feeder, if pages are present; otherwise, display a message.

Page Size

Choose the desired page size from this drop-down list box. This will ensure that you scan the entire image without over-scanning. If the size you need is not available, choose **Scanner's Maximum** and. then use the **Scan Area** dialog box (page 14) to adjust the scanning area to the desired size.

Page Layout

Under **Page Layout**, click **Portrait** if the text or image appears across the narrow dimension of your pages. Click **Landscape** if the text or image appears across the wide dimension of your pages.

Paper Orientation

Under **Paper Orientation**, click the scanning orientation that corresponds to the way you are scanning your pages, either **top**, **bottom**, **right**, or **left** edge first.

Note

The orientation of your pages depends on whether you are scanning from the feeder or flatbed. Choosing the correct combination of **Page Layout** and **Paper Orientation** results in images that are right-side-up.

More

Click **More** to display the **Advanced Settings** dialog box, described on page 8.

Area

Click **Area** to display the **Scan Area** dialog box, described on page 14:

OK

Click **OK** to save the settings you made and close the Scanner Settings dialog. You may now begin scanning with your new settings.

Default

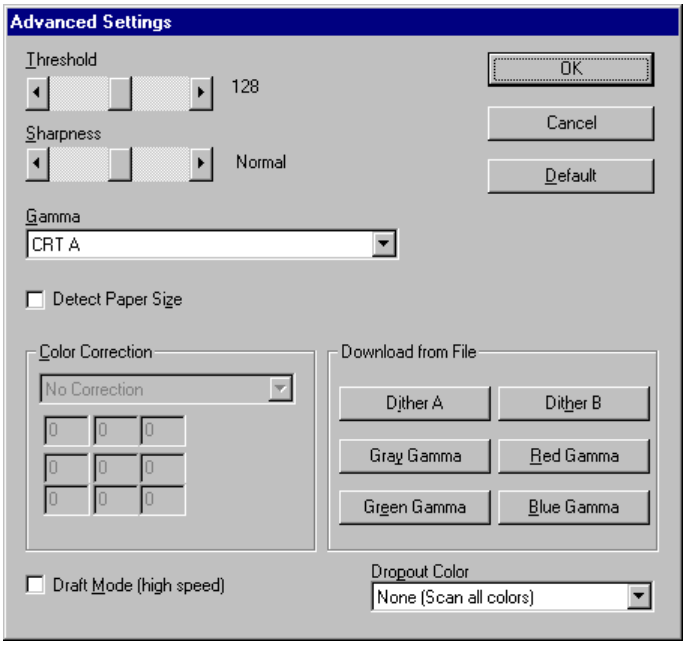
Click **Default** to restore the default settings to this dialog box, the **Scan Area** dialog box, and the **Advanced Settings** dialog box.

Cancel

Click **Cancel** to close the **Scanner Settings** dialog box without saving any of the changes you have made in this dialog, the **Scan Area** dialog box, or the **Advanced Settings** dialog box.

Advanced Settings dialog box

The **Advanced Settings** dialog box appears when you click **More** in the **Main Scanner Settings** dialog box. It enables you to control the special features of the scanner.



Note

In some applications, some of the controls described in the previous section, "Standard Scanner Settings Dialog Box," may instead appear in the **Advanced Settings** dialog box.

Threshold

When scanning in Black and White mode, use this control to adjust the gray level in the original document at which the scanner switches from outputting a white pixel to outputting a black pixel. The **Threshold** control is unavailable in color and grayscale scanning modes.

Sharpness

Use this control to sharpen or soften the scanned image, as desired. Use the scroll bar to choose from among five settings:

- **Defocus**
- **Defocus slightly**
- **Normal**
- **Sharpen slightly**
- **Sharpen**

Gamma

Gamma is the mapping of one brightness value to another. By default, most scanners map brightness data evenly over a range of values so that black looks black, white looks white, and values in between have appropriate brightness or color values. The GT-30000 enables you to adjust the gamma for gray and color scans. When used with grayscale scanning, gamma correction is used to change the gray level in the

scanned image for a given level of gray in the original image. When used with color scanning, gamma correction is used to change not only the brightness level of individual colors, but also the mixture of red, green, and blue in each color, and therefore the color balance of the image.

The EPSON GT-30000 scanner has five built-in gamma correction tables and one downloadable (user-defined) gamma correction table:

Gamma Correction Name	Purpose
CRT A	Optimized for scanning pages to be displayed in black-and-white on a computer monitor.
CRT B	**Default setting**. Optimized for scanning pages to be displayed in multiple shades of gray or color on a computer monitor
User defined	Selects the downloaded gamma table(s) provided by the user. **Note**: This setting overrides the **Brightness** setting. If no gamma table has been downloaded, the scanner uses the default gamma setting (CRT A).
Printer A/High density printing	Optimized for scanning pages that were printed on a 24-pin dot-matrix printer in "Near Letter Quality" (NLQ) mode.
Printer B/Low density printing	Optimized for scanning pages that were printed on an 8-pin dot matrix printer.
Printer C/High contrast printing	Optimized for scanning pages with mixed images and characters that have high contrast, such as those printed on a laser printer.

Creating a Gamma File

To create a gamma table file for the EPSON GT-30000 scanner, use a text editor or word processor capable of saving plain text (ASCII) files. Follow these steps:

1. On the very first line of the file, type a description of the file.
2. On the second line of the file, type the number of gamma file entries. The maximum size of a gamma table is 256 entries.
3. On each of the remaining lines (line 3 through a maximum line 258), type values for gamma value 0 through gamma value 255, respectively.

Line	Data
1	Description
2	Number of values
3	gamma value 0
4	gamma value 1
5	gamma value 2
.	
.	
.	
258	gamma value 255

4. Give the file a descriptive name with a PXG extension, such as **mygamma.pxg** and save the file in the **\WINDOWS\PIXTRAN** directory.
5. For a color gamma table, create three gamma files, one for red, one for green, and one for blue. Each of these files specifies a gamma mapping for one color.

Examples

The following PXG file contains a gamma table which inverts images. The first line is the description, the second line (256) is the count of gamma values and lines 3-258 contain the gamma values 255-0.

```
Inverted linear gamma
256
255
254
253
.
.
.
1
0
```

The following PXG file contains a gamma table which sets a normal linear gamma curve. The first line is the description, the second line (256) is the count of gamma values and lines 3-258 contains the gamma values 0-255.

```
Linear gamma curve
256
0
1
2
.
.
.
254
255
```

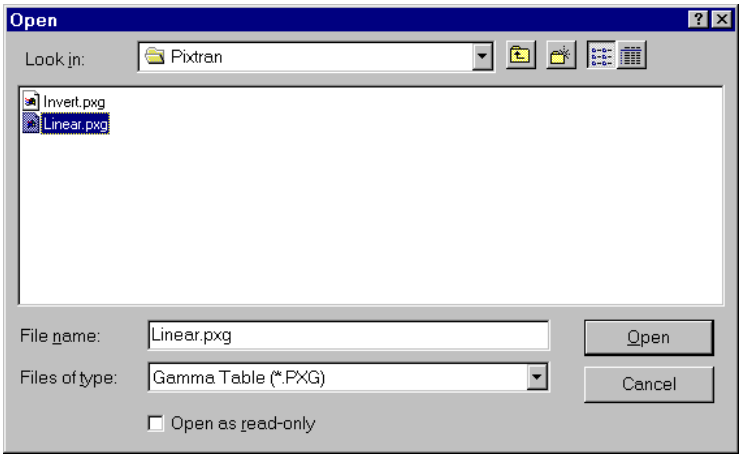
Downloading a Gamma Table

After you have created one or more gamma table files as described above, you must download the desired one to the scanner. To do this, follow these steps:

1. In the **Advanced Settings** dialog box (which appears after clicking **More** in the **Scanner Settings** dialog box), click the appropriate **Gamma** button:

   - **Gray Gamma**
     Select a grayscale gamma file to download to the scanner.
   - **Red Gamma**
     Select a red gamma file to download to the scanner.
   - **Green Gamma**
     Select a green gamma file to download to the scanner.
   - **Blue Gamma**
     Select a blue gamma file to download to the scanner.

   The following dialog box appears:



2. Navigate to the desired directory using the dialog controls. Usually, this should be the **Pixtran** subdirectory of the **Windows** directory (or **Winnt**, if you are using Windows NT).
3. Choose the desired gamma table file, then click **OK**.
4. Remember to choose **User defined** in the **Gamma** list of the **Advanced Settings** dialog box to enable the downloaded gamma table.

Note

A downloaded gamma table remains in the scanner until the power is turned off, the scanner is reset, or the table is replaced by downloading another table.

Creating a Dither Pattern File

To create a dither pattern file for the EPSON GT-30000 scanner, use a text editor or word processor capable of saving plain text (ASCII) files. Dither patterns are specified as a matrix of values. The purpose of a dither pattern matrix is to simulate halftoning (converting shades of gray to patterns of black and white dots) in such as way as to avoid *aliasing*. Aliasing is the appearance of repeating patterns such as lines or stripes in the image. Specification of the values for dither threshold files is complex and beyond the scope of this document. If you are inexperienced with dither algorithms, you should use the built-in dither patterns. Follow these steps to create a dither pattern file:

1. On the very first line of the file, type a description of the file.
2. On the second line of the file, type the size of the dither threshold matrix. Dither thresholds are specified as either a 4 x 4, 8 x 8, or 16 x 16 matrix.
3. On the remaining 4, 8, or 16 lines, type 4, 8, or 16 values so as to make a matrix of the size specified on line 2.

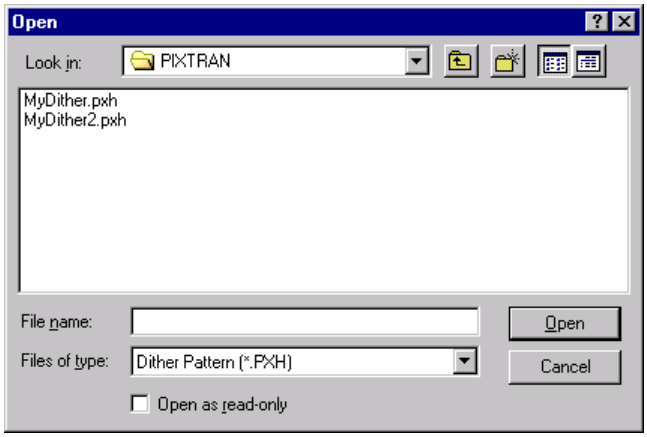
Line	Data
1	`Description`
2	`Size of matrix`
3	`value 1  value 2  value 3  value 4`
4	`value 5  value 6  value 7  value 8`
5	`value 9  value 10  value 11  value 12`
6	`value 13  value 14  value 15  value 16`

4. Give the file a descriptive name with a PXH extension, such as **`mydither.pxh`** and save the file in the **`\WINDOWS\PIXTRAN`** directory.

Downloading a Dither Pattern

After you have created one or more dither pattern files as described above, you must download the desired ones to the scanner. The EPSON GT-30000 scanner allows you to download two dither patterns, and then choose between them using the **Dither** list in the **Scanner Settings** dialog box (page 5). To download a dither pattern file, follow these steps:

1. In the **Advanced Settings** dialog box (which appears after clicking **More** in the Scanner Settings dialog), click the **Dither A** or **Dither B** button, according to which of the two user-defined patterns you want to use. The following dialog appears:



2. Navigate to the desired directory using the dialog controls. Usually, this should be the **Pixtran** subdirectory of the **Windows** directory (or **Winnt**, if you are using Windows NT).
3. Choose the desired dither pattern file, then click **OK**.
4. Remember to choose **Download pattern A** or **Download pattern B** in the **Dither** list of the **Scanner Settings** dialog box (page 5) to enable the desired dither pattern.

Note

A downloaded dither pattern remains in the scanner until the power is turned off, the scanner is reset, or the pattern is replaced by downloading another pattern.

Detect Paper Size

Select the **Detect Paper Size** check box to enable the scanner to automatically detect and set the correct paper size. The scanner evaluates each page it scans and chooses the best page size from a list of predefined sizes. Clear the **Detect Paper Size** check box to use the fixed page size you have set in the Scanner Settings dialog box, as explained on page 7.

Color correction

The **Color Correction** settings enable you to map each of the scanner's color outputs (red, green, and blue) to different colors in the resulting image. The default setting of **None** does not change the scanner's color values at all.

If desired, you can choose one of four built-in color correction tables, or you can define your own. To use one of the built-in color correction tables, choose the desired one from the list under **Color Correction** in the **Advanced Settings** dialog box:

- Impact dot-matrix printer
- Thermal printer
- Ink-jet printer
- CRT monitor

Each of these built-in color correction tables provides pleasing results with the target device.

If desired, you can define your own color correction table. Color balance or correction is often done with the aid of additional equipment for determining color parameters by sampling areas of the original image, the display screen, and/or the output of a color printer so that all devices will produce an accurate color rendition. The data output by such color correction devices can be used in the **Color Correction** table.

To define your own color correction values, choose **User defined** in the list under **Color Correction**, then supply values in the color correction table as follows:

	colors in the original image		
output colors	green	red	blue
green	32		
red		32	
blue			32

A value of **0** in one of the cells maps the color to black; a value of 255 maps it to its maximum value. By supplying values in each of the columns, you can specify a mapping between input colors and output colors.

Note

The user-defined color correction settings you enter remain in place even if you choose a different Color Correction table, appearing again when you select **User defined**. However, if you click **Default**, the user-defined values in the table are reset to 0.

Dropout Color

The EPSON GT-30000 can scan a selected color as white by using a feature called *dropout*. It does this by scanning with one of the primary colors disabled. This feature is most useful when scanning forms that have been designed specifically for dropout scanning. Such forms are printed in a carefully-selected dropout

color (such as red) so that when the form is filled in in a color other than red and scanned, all of the form's lines and text are invisible. Only data not printed in red appears in the scanned image.

To use the Dropout feature, choose the desired dropout color (**Red**, **Green**, or **Blue**) from the list. To scan with all colors, choose **None (Scan all colors)**.

Draft Mode (high speed)

Select the **Draft Mode (high speed)** check box to quickly check your selected image area and other settings. Draft mode produces a quick, low-resolution scan using all specified settings except **Dots per inch.**

OK

Click **OK** to save the advanced settings and return to the **Scanner Settings** dialog box.

Default

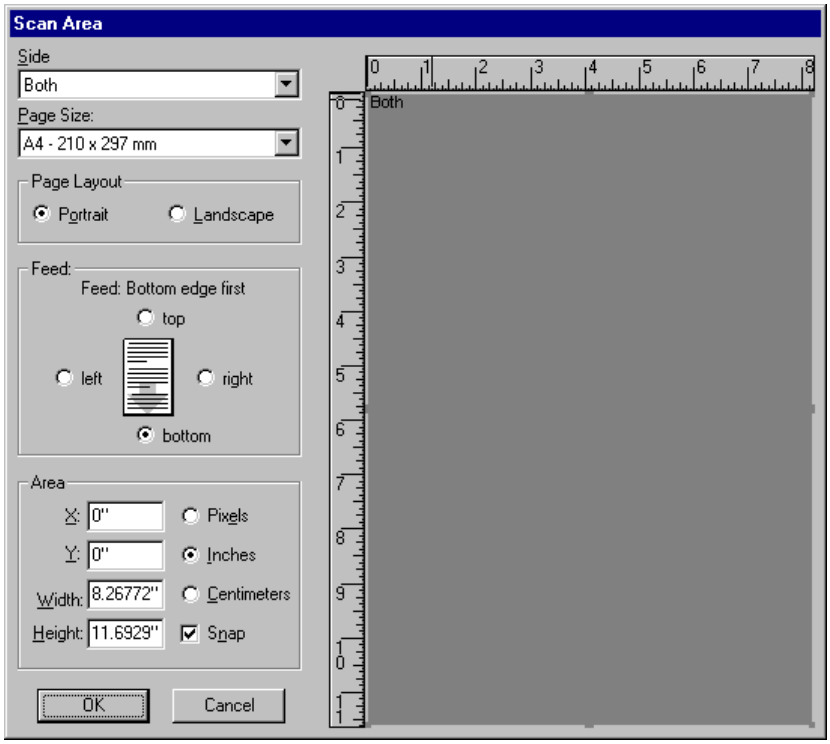
Click **Default** to restore the default settings to the **Advanced Settings** dialog box.

Cancel

Click **Cancel** to close the **Advanced Settings** dialog box without saving any of the changes you have made.

Scan Area dialog box

The **Scan Area** dialog box enables you to specify the area of the page to scan.



Note

Some applications may display a different **Scan Area** dialog box containing only the controls in the **Area** section of the dialog box shown above. In this case, some of the controls described below are not available.

You can either set the scan area size and position by dragging the "handles" in the preview area on the right, or by entering numbers in the various settings under **Area** on the left. In either case, the other side will reflect the settings you make. The combination of **X** and **Y** position defines the upper left corner of the area to scan.

Preview area

The preview area displays an image of the current page. If no pages have been scanned or opened, it displays dark gray as shown in the illustration above. You can resize this dialog box by dragging any corner. Resizing the dialog box enables you to make the preview area bigger or smaller.

Side

The EPSON GT-30000 enables you to specify a different scan area for each side of a page when scanning in duplex mode. Use the **Side** list to choose the side on which to set the scan area.

Both	The scan area you specify applies to both sides of a duplex scan.
Front	The scan area you specify applies to the front side only.
Back	The scan area you specify applies to the back side only.

Page Size

Choose the desired page size from this drop-down list box. This control duplicates the **Page Size** control in the main **Scanner Settings** dialog box (page 7).

Page Layout

Under **Page Layout**, click **Portrait** if the text or image appears across the narrow dimension of your pages. Click **Landscape** if the text or image appears across the wide dimension of your pages. This control duplicates the **Page Layout** control in the main **Scanner Settings** dialog box (page 7).

Feed

Under **Feed**, click the option that corresponds to the way you are feeding your pages, either **top**, **bottom**, **right**, or **left** edge first. This control duplicates the **Paper Orientation** control in the main **Scanner Settings** dialog box (page 7).

Area

Use these controls to specify the scanning area, or to determine the exact scanning area you defined by using the handles in the preview area.

X	The distance from the left edge to the upper left corner of the scan area in the selected measurement units.
Y	The distance from the top edge to the upper left corner of the scan area in the selected measurement units.

Width	The width of the scan area in the selected measurement units.
Height	The height of the scan area in the selected measurement units.
Pixels, Inches, Centimeters	Select the desired measurement units from these three choices. Any measurements present are converted to the units you select.
Snap	Select this check box if you want the scanning area to automatically adjust to an even measurement boundary (0.1 cm, or 1/8") when dragging the handles in the preview area. Clear this check box if you want the scanning area to remain exactly as you define it.

Special Tags

This section describes the special tags present in the driver that an application must use to properly enable the EPSON GT30000 scanner's special features. This information is intended for use by application developers, not users of the scanner.

TAG_DROPOUT	Valid choices: TAG_DROPOUT_NONE (0), TAG_DROPOUT_RED (1), TAG_DROPOUT_GREEN (2), and TAG_DROPOUT_BLUE (3)
TAG_COLOR_TRANSFORM_MATRIX1	An array of coefficients for color correction.
TAG_GAMMA_TABLEGREY	A list of values for a single-plane (grayscale) gamma table to downloaded to the scanner.
TAG_GAMMA_LENGTHGREY	The length of the single-plane gamma table in bytes. Normally this is 256.
TAG_GAMMA_TABLERED TAG_GAMMA_TABLEGREEN TAG_GAMMA_TABLEBLUE	Each of these tags contains a list of values for one plane of a color gamma table to downloaded to the scanner.
TAG_GAMMA_LENGTHRED TAG_GAMMA_LENGTHGREEN TAG_GAMMA_LENGTHBLUE	The length of each color plane of the gamma table in bytes. Normally this is 256.
TAG_DITHER_PATTERN1 TAG_DITHER_PATTERN2	A table of dither pattern values for **Download Pattern A** and **Download Pattern B**, respectively.
TAG_DITHER_LENGTH1 TAG_DITHER_LENGTH2	The length of the dither pattern matrix for **Download Pattern A** and **Download Pattern B**, respectively.
TAG_SHARPNESS	One of the following values: • -2 Defocus • -1 Defocus slightly • 0 Normal • 1 Sharpen slightly • 2 Sharpen
TAG_SCANNINGSPEED	One of the following values: • 0 Normal speed • 1 High speed (draft mode)