

CHAPTER

5

Managing SAS Output

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Printing

The SAS System under OS/2 takes advantage of the OS/2 printers. You can manage your output in the same manner as you manage output from other OS/2 applications. You can also take advantage of OS/2 fonts that are supported by your printers. For details about using OS/2 printers, see your OS/2 documentation. “Producing Graphics” on page 111 discusses how to route graphics from your SAS session to printers.

Printing from within a SAS Window

To print the contents of one of the SAS windows, make that window active (by clicking on it) and select

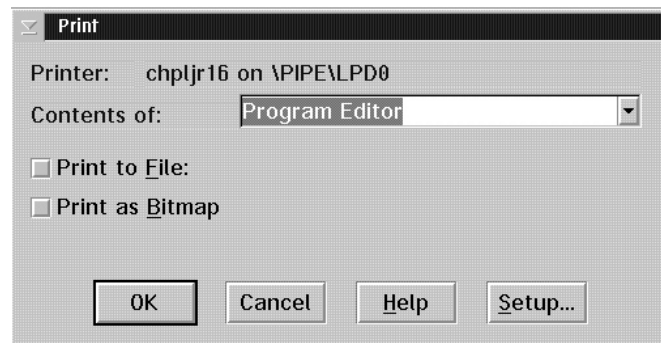


From the Print dialog box (shown in Display 5.1 on page 102), you can choose from several actions:

- To print the contents of the currently selected window as text, click on **OK**.
- To print the contents of the currently selected window as a bitmap (that is, as a picture of the window instead of as text), select the **Print as Bitmap** check box; then click on **OK**.
- To print the contents of the currently selected window to a printer file (formatted for the current printer), select the **Print to File** check box, type in the filename, and then click on **OK**.
- To print the contents of the OS/2 clipboard, click on the **Contents of:** field. From the displayed list box, select **Clipboard (text)** (or **Clipboard (bitmap)** if you are printing it as a bitmap); then click on **OK**.

Note: The Print dialog box that is shown here might differ from what you see on your system, depending on which version of OS/2 you use to run SAS and on the active SAS window. Δ

Display 5.1 The Print Dialog Box



The Print dialog box displays the destination printer's name and the type of printer. To change the destination printer, click on **Setup...** and select a new printer from the Print Setup dialog box.

You can perform other printing tasks by combining these methods. For example, you can print the contents of the currently selected window as a bitmap to a printer file by selecting both the **Print to File** and **Print as Bitmap** check boxes.

Here is a summary of the choices that are related to SAS that the Print dialog box offers:

Contents of:

displays the name of the window whose contents you want to print. You can choose between the currently selected window and the OS/2 clipboard. If you select **Print as Bitmap**, you can also choose to print a bitmap of the main SAS window or a bitmap of the entire screen.

Print to File

prints the selected window to a printer file in the correct format. For example, if your currently selected printer is a PostScript printer, the resulting file will be in PostScript format. The Print dialog box prompts you for a filename.

Note that you cannot edit the resulting printer file; it is in a format that is readable only by the type of printer that is specified in the Print dialog box. If you want to save the contents of an application window to a text file without printer formatting, use the **Save As...** item in the **File** menu.

Print as Bitmap

prints the currently selected window as a bitmap instead of as text.

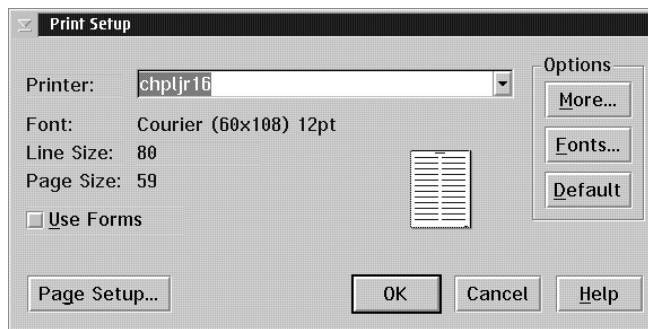
For more detailed information about the Print dialog box, click on the **[Help]** button.

Changing the Print Options

The Print Setup dialog box (shown in Display 5.2 on page 103) lets you control how the SAS System prints information. For example, you use this dialog window to select the page setup and the font that is used to print.

You can access this dialog box by selecting **Print Setup...** from the **File** menu, or by clicking on **[Setup...]** from the Print dialog box. If you are using an application that does not provide access to the menus, you can type DLGPRTSETUP at a command line.

Display 5.2 The Print Setup Dialog Box



The SAS System consults these sources for default printer settings (in order of precedence, first to last):

- the setting of the SYSPRINT system option
- the system default printer (which you can select by adjusting the printer's properties in the OS/2 Printers folder).

Here is a summary of the information that is presented in the Print Setup dialog box:

Printer:

displays the name of the currently selected printer. To change the print job settings, click on **[More]**.

Font

displays the current font. To change the font, click on **[Fonts...]** and then select a new font, style, and size from the Font dialog box.

When you change the font size, the SAS System recalculates the maximum **LINESIZE** and **PAGESIZE** values and displays them on the Print Setup dialog box.

Note: SAS tabular and columnar reports are formatted in a monospace font. Using a proportionally spaced font might produce improperly formatted reports. △

Line Size and Page Size

display the maximum calculated line size and page size, respectively, for the current printer and font settings. Although you cannot set these values directly from this dialog, you can adjust them by changing the page setup, the font, and the destination printer. Click on **Page Setup...** to access the Page Setup dialog box. From there, you can change the margins and page orientation, which in turn affect the line size and page size. The LINESIZE and PAGESIZE system options change when you click on **OK**.

Also, the Print Setup dialog box contains a graphic that depicts the current page orientation and margin settings.

Note: The margin settings affect printed output only. \triangle

Use Forms

specifies whether to use SAS System print forms, as described in “Using SAS System Print Forms” on page 105.

To return to the default printer settings, click on **Default**.

Changing the Print Options Using the SAS System Options Window

To change the printer options using the SAS System Options window, you must know the printer name, the font, and the line and page size that you want to use.

To change the printer settings by using the SAS System Options window, select

Tools ► **Options** ► **System**

You can then make the following changes to the printing system options:

- To change the printer:
 - Select the **Log and procedure output control** folder and then select the **Procedure output** folder.
 - With the right mouse button, click on **Sysprint** and select **Modify Value** from the pop-up menu.
 - Type a printer name in the New Value text box and click on **OK**. Type the printer name as it appears in the OS/2 printer properties. The printer name is case-sensitive.
- To change the font:
 - Select the **Log and procedure output control** folder and then select the **Procedure output** folder.
 - With the right mouse button, click on **Sysprintfont** and select **Modify Value** from the pop-up menu.
 - Type a font in the New Value text box and click on **OK**.

For valid values, see “SYSPRINTFONT” on page 379.

- To change the line size and page size:
 - Select the **Log and procedure output control** folder and then select the **Log and procedure output** folder.
 - With the right mouse button, click on **Linesize** or **Pagesize** and select **Modify Value** from the pop-up menu.
 - Type a line size or page size in the New Value text box and click on **OK**.

Changing the Page Setup Options

The Page Setup dialog box (shown in Display 5.3 on page 105) lets you set the margins and orientation for your printed output.

You can access this dialog box by

- typing DLGPAGESETUP in the command bar
- selecting

File ► Page Setup

- clicking on Page Setup from the Print Setup dialog box.

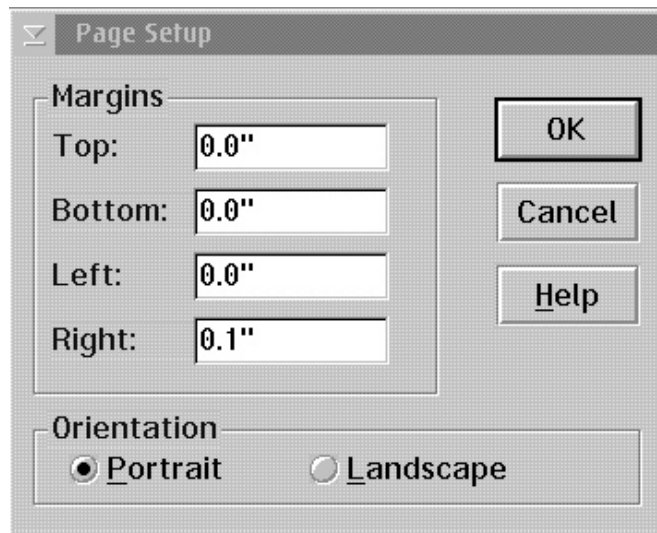
You can also change the margins and orientation by using the LEFTMARGIN, RIGHTMARGIN, TOPMARGIN, BOTTOMMARGIN, and ORIENTATION system options from the SAS System Options window. To change these options

1 Select

Tools ► Options ► System... ► Log and procedure output control
 ► ODS printing

- 2 Place the cursor over the appropriate system option, click the right mouse button, and select **Modify Value**.
- 3 Type a new value and click on **OK**.

Display 5.3 Page Setup Dialog Box



Here is a summary of the information that is presented in the Page Setup dialog box:

Margins

displays the amount of space to leave blank from the top, bottom, left, and right edges of the paper. To change the margins, click in the text box and type in the margin size.

Orientation

lets you select either Portrait or Landscape. Portrait prints vertically, landscape prints horizontally.

Using SAS System Print Forms

To use a form to print from the SAS System, select the **Use Forms** check box in the Print Setup dialog box. When you print, the SAS System prints your output with the current print form.

To specify a print form as the current print form, use the FORMNAME command or specify the FORMS option in your SAS configuration file or in the SAS System Options window. To learn the name of the current form, issue the FORMNAME command with no parameters.

Using the FORM Window

The FSFORM command opens the FORM window, in which you can define print forms to use when you print SAS output. You can specify printers, page formats, margins, fonts, and printer control language in a FORM entry.

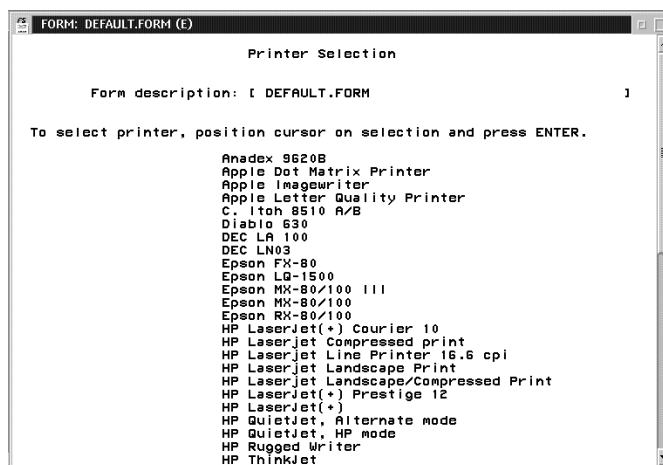
To invoke the FORM window, issue the following command:

```
FSFORMcatalog-name.form-name
```

See the SAS System Help for more information about the FSFORM command.

While the majority of the frames in the FORM window are the same across all operating environments, the first frame that you see after issuing the FSFORM command is the Printer Selection frame, which lists the printers that you are able to use under OS/2. Display 5.4 on page 106 shows the default information for this frame. To move from one FORM window frame to the next, use the NEXTSCR and PREVSCR commands. These commands are located under the **Tools** menu item.

Display 5.4 Printer Selection Frame



The information in the Printer Selection frame is also site-dependent, so the printer list at your site will be different from the one shown in Display 5.4 on page 106.

The Printer Selection frame appears only when you create a new print form. After you create a form, it is stored in your user profile catalog or in the catalog that was specified with the FSFORM command (entry type FORM). The next time that you modify this form, the Printer Selection frame is skipped. You cannot return to the Printer Selection frame from the second FORM window frame.

Printing with SAS Commands

If you prefer typing commands to using menus, you can use the PRINT or SPRINT command to print the contents of the active window. For more information about these commands, see the SAS System Help.

Sending DATA Step Output to a Printer

You may want to spool your DATA step output to a printer instead of to a file. Use the FILENAME statement and the PRINTER device-type keyword to accomplish this, as in the following example:

```
filename myfile printer;
data _null_;
  set mydata;
  file myfile;
  where city='Cincinnati';
  put _all_;
run;
```

In this example, the PRINTER device-type keyword specifies to print the output to the printer that is specified in the SYSPRINT system option. For more information about the SYSPRINT system option, see “SYSPRINT” on page 379.

Sending Printed Output to a File

You can send your printed output to a file by clicking the **Print to File** check box in the Print dialog box, and then specifying the name of a file to print to. This is *not* the same as a save operation; the resulting printer file contains all the printer control language that is necessary to support whatever options you have chosen with the Printer Setup dialog box, such as fonts and page orientation. In most cases, this printer file is not readable with a text editor; it is meant only to be sent to the printer.

You can also route printed output to a file by using the FILENAME statement, which is useful for routing DATA step output. Here is an example:

```
filename myfile printer altdest='c:\sas\results.dat';
data _null_;
  set qtr1data;
  file myfile;
  where sales ge 1000;
  put _all_;
run;
```

In this example, the output from the DATA step is routed to a file, yet still contains all the printer control information that is necessary for you to use your printer to produce formatted output.

Another method of sending printed output to a file is to select the **Output to file** check box in your printer’s Properties notebook Output Port page. When you send output to a file, the contents of the file are overwritten if the file already exists. See your OS/2 documentation for more information about changing printer properties.

Printing in Batch Mode

When you run SAS jobs in batch mode, you do not have access to the Print and Printer Setup dialog boxes, but you can still take advantage of the OS/2 printer. Use the SYSPRINT system option to specify your default printer (and the SYSPRINTFONT system option to specify your printer font, if you want) as described on “SYSPRINT” on page 379. For example, suppose your SAS configuration file contains the following option:

```
-sysprint "f2hp5"
```

Then, your SAS program might contain the following statements:

```
filename myfile printer;
data _null_;
  set schools;
  file myfile;
  where enrolled le 500;
  put _all_;
run;
```

When you submit your job, the SAS System uses the SYSPRINT printer specification to spool your output from the DATA step to the OS/2 printer.

Default Printer Details

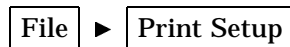
The SAS System looks for a default printer as follows (in order of precedence, first to last):

- the SYSPRINT system option value
- the OS/2 system default printer.

The SYSPRINT system option is defined as the OS/2 default printer during SAS installation.

To see the value of the SYSPRINT system, open the Print Setup dialog box by either

- selecting



- typing DLGPRTSETUP in the command bar.

To change the SYSPRINT system option, see “Changing the Print Options” on page 103.

Routing Procedure Output to a Web Browser

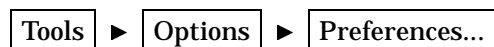
Beginning with Version 7 of SAS, the Output Delivery System can create your procedure output in HTML to be viewed in a Web browser. The procedure output HTML file is displayed in the Web browser that is specified in the Preferences dialog box Web page. When you specify to display procedure output in HTML, you switch to another application to view the HTML output.

For more information about using HTML within the Output Delivery System, see *The Complete Guide to the SAS Output Delivery System*.

Configuring Preferences for HTML Output

For SAS to create an HTML file from your procedure output and to know where to display the HTML file, you configure the Results and Web pages of the Preferences dialog box.

To open the Preferences dialog box, select



To configure the Results page:

Click on the Results page.

Select the **HTML** check box.

Click in the **style** check box and highlight a style. The style defines colors and fonts to display your output.

Select where to save your HTML file. To save HTML files only while the current SAS session is active, select the **Use WORK folder** check box. Saving HTML files to a temporary folder is useful when you are testing a procedure and creating a multitude of HTML files. Recall that when you exit the SAS System, all temporary files are deleted.

To save the HTML files in a folder that is not deleted when a SAS session ends, type a path name in the **Folder** text box or click on **[Browse]** to select a folder.

To configure the Web page of the Preferences dialog box:

- Click on the Web page.
- In the **Preferred Browser** text box, type the browser's path and filename or click on **[Browse]** to find the browser filename.

For more information about using HTML within the Output Delivery System, see *SAS Procedures Guide*.

Routing Procedure Output and the SAS Log to a File

This section provides examples of the most common methods of routing SAS procedure output and the SAS log to a file. Generally, this task is the same across operating environments and is discussed in the SAS System Help. However, the specification of external filenames and devices is system dependent. See “Referencing External Files” on page 82 for complete information about the various ways to reference external files.

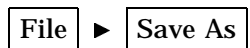
You can route your SAS procedure output or the SAS log to a file in one of several ways. The method that you choose depends on the method that you use to run the SAS System, the moment at which you make your decision to route the output or SAS log, and your personal preference.

Some methods of sending SAS procedure output or the SAS log to a file include using

- the Save As dialog box, invoked either from the **File** menu, the pop-up menu for the window that you want to save, or by typing DLGSAVE in the command bar.
- the FILE command.
- the PRINTTO procedure.
- various system options, including PRINT and ALTLOG.

Using the Save As Dialog Box

The easiest way to save the contents of the active window to a file is to select



from the main SAS menu or pop-up menu, making sure that the active window (for example, Log or Output) contains the output that you want to save. For more information about the Save As dialog box, see “Opening and Saving Files” on page 29.

Using the PRINTTO Procedure

In batch SAS sessions, the SAS procedure output and the SAS log are written by default to files named *filename.LST* and *filename.LOG*, respectively, where *filename* is

the name of your SAS job. For example, if your SYSIN file is MYPROG.SAS, the procedure output file is named MYPROG.LST, and the log file is named MYPROG.LOG. However, you can override these default filenames and send your output and log to any file that you choose. For example, suppose that your job contains the following statements, which assign the fileref MYOUTPUT to the file C:\SAS\FIRST.TXT. Then the PROC PRINTTO statement tells the SAS System to send any upcoming SAS procedure output to the file that is associated with MYOUTPUT.

```
filename myoutput 'c:\sas\first.txt';
proc printto print=myoutput;
run;
```

Any PROC or DATA statements that follow these statements and that generate output send their output to the C:\SAS\FIRST.TXT file, not to the default procedure output file. If you want to return to the default file, issue an empty PROC PRINTTO statement like the following example:

```
proc printto;
run;
```

Issuing these statements redirects the SAS procedure output to the default destination (*filename.LST*). In this way, you can send the output and log from different parts of the same SAS job to different files.

Note: If you route procedure output to a file, the resulting file may contain carriage control characters. To suppress these control characters when you include the file in the Program Editor window, set the RECFM= option to P in the FILENAME statement. Δ

If you want to send the SAS log to a specific file, use the LOG= option instead of the PRINT=option in the PROC PRINTTO statement. For more information about the PRINTTO procedure, see “PRINTTO” on page 283 and *SAS Procedures Guide*.

Note: When you use the PRINTTO procedure to route SAS procedure output or the SAS log, the status window does not reflect any rerouting of batch output but indicates that it is routing the procedure output file and log to *filename.LST* and *filename.LOG*. Δ

Using SAS System Options

You can use SAS system options to route your SAS output or SAS log to a file. For example, if you want to override the default behavior and send your procedure output from a batch SAS job to the file C:\SAS\PROG1.TXT, you can invoke the SAS System with the following command:

```
sas -sysin c:\sas\prog1
    -print c:\sas\prog1.txt
```

This SAS command executes the SAS program PROG1.SAS and sends the procedure output to the file C:\SAS\PROG1.TXT. You can treat the SAS Log similarly by using the LOG system option instead of the PRINT system option. Two other related system options, the ALTPRINT and ALTLOG options, are explained in “ALTPRINT” on page 325 and “ALTLOG” on page 324.

Note: The status window does reflect the PRINT and LOG system option values when it records where the procedure output and log are being sent. Δ

Producing Graphics

See *SAS/GRAPH Software: Reference* for full details about using SAS/GRAPH software. Also see “Overview of Graphics Considerations” on page 405 for further details about using graphics and fonts with the SAS System under OS/2.

Producing Graphics on Your Display

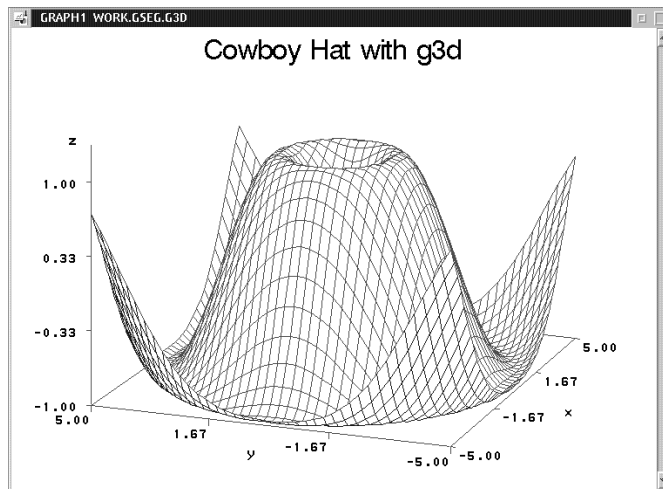
In most cases, output is automatically displayed on your monitor when you run a SAS/GRAPH procedure; it is not necessary to specify a SAS/GRAPH device driver. Information about your graphics display is stored in an OS/2 information file and is automatically used by the SAS System during an interactive SAS session.

Here is a simple example of how to produce a graphic:

```
data hat;
  do x=-5 to 5 by .25;
    do y=-5 to 5 by .25;
      z=sin(sqrt(x*x+y*y));
      output;
    end;
  end;
proc g3d data=hat;
  plot y*x=z/ctop=red;
  title 'Cowboy Hat with G3D';
run;
quit;
```

Display 5.5 on page 111 shows the output for this program:

Display 5.5 Cowboy Hat Procedure Output



If you use the `DEVICE=` option in the `GOPTIONS` statement to route your graphics to a hardcopy device, and then you want to return to using your monitor to display graphics, you must specify a driver. Submit the following statement to display graphics output on your monitor:

```
goptions device=win;
```

You should also use the WIN device driver to produce graphics on your display when you run your SAS job in batch mode.

If you specify that your program output is to be displayed in HTML, your graphic is converted to a .GIF file and stored in the same folder as your SAS System data set. For more information, see *The Complete Guide to the SAS Output Delivery System*.

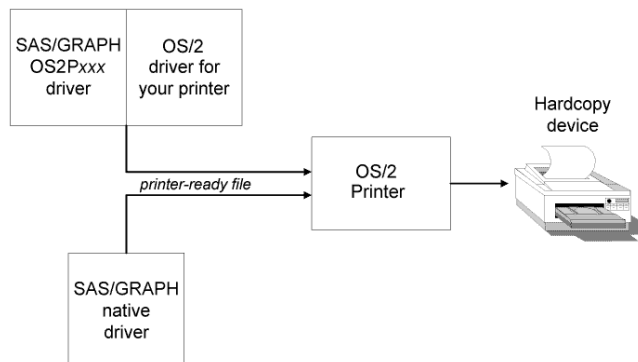
Printing Graphics

You can use two methods to print output from SAS/GRAPH:

- Use a printer driver for your device (supplied with OS/2 or with your output device). This method allows SAS/GRAPH to send generic graphics commands to the OS/2 printer driver, which then translates the commands to a format that the printer can use.
- Use a SAS/GRAPH printer driver to create a printer-specific graphics stream that can be sent directly to the device. When you use a SAS/GRAPH printer driver, SAS bypasses the OS/2 printer drivers and creates printer-ready output for your device. The printer driver is also called a SAS/GRAPH native printer driver, which means that the driver creates output by using the printer language that is native to the target device, SAS/GRAPH printer drivers under OS/2 are similar to those that are used by the SAS System under mainframe and UNIX operating environments.

After SAS prepares output for a printer (by using either OS/2 printer drivers or a SAS/GRAPH printer driver), the output is sent to the OS/2 printer, which then queues it for printing on the device of your choice. Figure 5.1 on page 112 illustrates how you can use the two sets of printer drivers within SAS/GRAPH to produce output for a given device.

Figure 5.1 SAS/GRAPH Generic Printer Drivers Compared with SAS/GRAPH Native Printer Drivers



The method that you choose depends on the output device that you are using; see “Choosing between a SAS/GRAPH Native Driver and the OS2Pxxx Driver” on page 114 for more information. You can control both graphics printing methods by using either the Print and Print Setup dialog boxes or the `SYSPRINT=` option and the `GOPTIONS DEVICE=` statement.

Using the SAS/GRAPH Generic (OS2Pxxx) Drivers

To print a graphic by using the SAS/GRAPH generic device drivers with the OS/2 printer drivers:

- 1 Select **Print Setup** from the **File** menu and verify that the **Printer** field in the Print Setup dialog box lists the correct OS/2 printer. You can use the Print Setup dialog box to select any printer that you have installed on OS/2. (To install new drivers and port combinations, use the WarpGuide, which you can access through the Assistance Center folder.)

Alternatively, you can use the SYSPRINT system option to assign the destination printer. For example,

```
options sysprint='HP LaserJet III';
```

Note that you may assign only printer driver names that have been previously configured in OS/2.

- 2 Run your SAS/GRAPH program with the following graphics option:

```
GOPTIONS DEVICE=OS2Pxxx;
```

The value of OS2Pxxx you specify depends on the type of output device that you use to print your graph:

```
OS2PRTM
  for black and white (monochrome) printers

OS2PRTG
  for grayscale printers

OS2PRTC
  for color printers

OS2PLOT
  for plotters.
```

The orientation of graphics output is determined by the following:

- If you specify the ROTATE= graphics option, the output is oriented according to the value that you specify for ROTATE. For example, suppose you specify

```
goptions rotate=landscape;
```

Then the output is oriented as landscape, regardless of the settings in the Print Setup dialog box.

- If you do not use the ROTATE= option, the output is oriented according to the settings in the Page Setup dialog box.

Note: Graphics printing is affected by the margins that are specified in the Page Setup dialog box. If you modify the margins when printing graphics and your intention is to keep the graphics proportional, be sure the change the top and bottom margins by the same amount that you change the left and right margins. Δ

Using the SAS/GRAPH Native Printer Drivers

SAS/GRAPH native drivers are drivers that produce output in the native language of the target device. Examples of SAS/GRAPH native drivers include

PS	produces Postscript output.
HPLJS3	produces output in the PCL5 language that is used by Hewlett-Packard LaserJet III printers.
HP7550	produces HPGL output that is used by Hewlett-Packard 7550 plotters.

After the SAS/GRAPH native printer driver has produced output in the native language of the target device, SAS then routes the output to the device that uses the OS/2 printer. The SAS System bypasses the OS/2 driver that is currently associated with the target device, but it does respect the destination that is specified in the Print Setup dialog box when deciding where to send the output.

To print a graph by using a SAS/GRAPH printer driver, run your SAS/GRAPH program with the following graphics options:

```
GOPTIONS DEVICE= driver-name;
```

where *driver-name* is the name of a valid SAS/GRAPH device driver. Consider this example,

```
goptions device=hpljs2;
```

This statement formats the graph for the Hewlett-Packard LaserJet Series II printer. You can view the complete list of SAS/GRAPH drivers by submitting the PROC GDEVICE statement.

To print a graph to a printer file (also called a graphics stream file, or GSF) instead of directly to a printer, use the GSFNAME option in the GOPTIONS statement and use a filename or fileref to specify where you want the output. For example:

```
filename graphout "graphic.prn";
goptions gsfname=graphout gsfmode=replace
        device=hpljs2;
```

Printing and Previewing from the GRAPH Window

You can preview a graph that you create and, at the same time, format it for optimal display on the device of your choice. To preview the graph before you print it, run your SAS/GRAPH program with the following GOPTIONS statement:

```
GOPTIONS TARGETDEVICE= driver-name;
```

where *driver-name* is either one of the OS2Pxxx drivers or a SAS/GRAPH native driver.

By specifying a target device, SAS/GRAPH can format the graph with colors and attributes that are appropriate for the target printer. To print the graph after it is displayed, select **Print** from the **File** menu.

Note: If you do not specify a target device before you create the graph, SAS/GRAPH will prompt you (in the Print dialog box) for a device driver name when you attempt to print the graph that you are previewing. In most cases the OS2PRTM or OS2PRTC driver is specified by default. The graph colors, orientation, and sizing might not be optimal for the output device you specify, however. Δ

Choosing between a SAS/GRAPH Native Driver and the OS2Pxxx Driver

When deciding whether to use SAS/GRAPH native drivers or the OS2Pxxx series of drivers, consider such factors as the device that you are using and the type of output that you want to produce. Note the following specific considerations:

- If no OS/2 printer driver is available for your device, use a SAS/GRAPH native driver.
- If you have a device for which there is no SAS/GRAPH native driver, use the OS2Pxxx driver, if an OS/2 printer driver is available for the device. In cases where a new model of hardcopy device becomes available between releases of the SAS System and the hardware vendor provides a new OS/2 driver that uses new features of the device, you can use a OS2Pxxx driver to take advantage of those features.

- To use OS/2 specific fonts in your SAS/GRAPH output, use one of the OS2Pxxx drivers and specify the font just as you would specify one of the installed hardware fonts for your printer. See “Overview of Graphics Considerations” on page 405 for more information about generating hardware fonts.

Importing Graphics from Other Applications

SAS/GRAPH lets you import bitmap and vector graphics that were created by other software packages. This provides these benefits:

- You can create your graphic by using another graphics editor, then import the graphic into SAS/GRAPH to produce output on a specialized device.
- You can merge clip art and graphs from other applications with the graphs that you create in SAS/GRAPH.

You can import bitmap graphics into these SAS System windows:

- GRAPH window. The imported graphic becomes a new GRSEG entry in the current catalog.
- Graphics Editor. The imported graphic becomes part of the current graph.
- Image Editor window. The imported graphic becomes a new image.

The SAS System provides two ways to import bitmap graphics into SAS/GRAPH:

- From the application that you used to create the graphic, copy the graphic to the OS/2 clipboard; then switch to your SAS session and paste the graphic into the SAS/GRAPH window, as described in “Pasting Graphics from the OS/2 Clipboard” on page 115.
- From the SAS/GRAPH window (or the Graphics Editor or Image Editor) import the graphics file by using the Import Image dialog box, as described in “Importing a Graphics File from within a SAS/GRAPH Window” on page 115.

To import vector graphics, use the GIMPORT procedure to import computer graphics metafile (CGM) files. The imported files are stored as GRSEG catalog entries. This method preserves the individual graphic objects in the imported graph, whereas the other methods treat the imported graphic as a single (uneditable) bitmap. For more information about PROC GIMPORT, see *SAS/GRAPH Software: Reference*.

Pasting Graphics from the OS/2 Clipboard

If the tool that you use to create the source graphics is an OS/2 application, then you can use the OS/2 clipboard to copy the graphics to your SAS session as follows:

- 1 From the application that you used to create the graphic, select the graphic and copy it to the clipboard. Use the copy procedures for your graphics tool.
- 2 Switch to your SAS session (or start your SAS session, if it is not already running).
- 3 With the SAS/GRAPH window active, select **Paste** from the **Edit** menu (or use the GPASTE command). The graphic is pasted into the SAS/GRAPH window.

Importing a Graphics File from within a SAS/GRAPH Window

SAS/GRAPH provides import filters to translate graphics files that were created in other applications to a format that you can use with the SAS System.

You can import graphics from other applications that produce files in any of the formats that are shown in Table 5.1 on page 116.

Table 5.1 Graphics Import File Formats

Graphics File Format	File Extension
OS/2 bitmap	BMP
OS/2 metafile	MET
Device independent bitmap	DIB
JPEG format	JPG
graphic interchange format (GIF)	GIF
tag image file format (TIFF)	TIF
PC Paintbrush	PCX
Truevision Targa	TGA
Encapsulated PostScript Interchange (EPSI)	PS
Portable Network Graphics	PNG
Photo CD image	PCD
Portable Pixmap	PBM
X Window bitmap	XBM
X Window dump	XWD

To import bitmap graphics into SAS/GRAPH:

- 1 Make the GRAPH window active, and then select **Import Image...** from the **File** menu.
- 2 Use the Import Image dialog box to select the source directory and graphics file. Ensure that the **Format** field shows the correct source format; this indicates which import filter SAS/GRAPH will use. You can have the SAS System automatically detect the file format of the file to import by selecting AUTO as the Format. Click on **OK**.

Note: Automatic file format detection through using AUTO does not detect the DIB file format Δ

You can also include IMAGE catalog entries in your graphs. For information about including IMAGE catalog entries, see *SAS/GRAPH Software: Reference*.

Exporting Graphics for Use with Other Applications

The SAS System provides the following methods of exporting graphics that were created in SAS/GRAPH for use with other word processing or desktop publishing packages, or for display on the Internet or on an intranet:

- Export the graphics to a file from the GRAPH window, Graphics Editor, or Image Editor, as described in “Exporting a Graphic to a File from a SAS/GRAPH Window” on page 117.
- Copy the graphics (or a portion of them) to the OS/2 clipboard, then paste the contents of the clipboard into the target application (as a bitmap or picture), as described in “Pasting Graphics from SAS/GRAPH into other OS/2 Applications” on page 117.

- Create a computer graphics metafile (CGM) file for use with a specific graphics package, using drivers that are included with the SAS System, as described in “Creating CGM Files for Export to Other Applications” on page 118.

You can also use SAS/GRAPH to create GIF and VRML files for use with Web browsers, PDF files for use with the Adobe Acrobat reader, and many other useful types of graphics files. For more information about how to create these types of files, see *SAS/GRAPH Software: Reference* and the online Help for SAS/GRAPH.

Exporting a Graphic to a File from a SAS/GRAPH Window

SAS/GRAPH provides export filters to translate graphics that were generated in SAS/GRAPH into formats that you can use with other applications, such as spreadsheet and desktop publishing programs.

You can export graphics from SAS/GRAPH in any of the formats that are shown in Table 5.2 on page 117.

Table 5.2 Graphics Export File Formats

Graphics File Format	File Extension
OS/2 bitmap	BMP
OS/2 metafile	MET
Device independent bitmap	DIB
JPEG format	JPG
graphic interchange format (GIF)	GIF
tag image file format (TIFF)	TIF
Adobe PostScript	PS
Encapsulated PostScript Interchange (EPSI)	PS
Portable Network Graphics	PNG
Portable Pixmap	PBM

To export a graph from the GRAPH window:

- 1 Make the GRAPH window active and then select **Export Image...** from the **File** menu.
- 2 In the Export Image dialog box, select the target file format.
- 3 Specify the directory and filename for the exported graphic. Click on **OK**.

For more information about exporting graphics to a SAS IMAGE catalog entry from the Image editor, see the online Help for SAS/GRAPH.

Pasting Graphics from SAS/GRAPH into other OS/2 Applications

A quick way to export graphics from the SAS System to another OS/2 application is to use the OS/2 clipboard. When you copy information from SAS/GRAPH to the clipboard, you can then paste that information into any application that accepts DIB or BMP input.

To copy information from SAS/GRAPH to the clipboard:

- 1 From the GRAPH window, hold down the left mouse button and drag the mouse over the portion of the graph that you want to copy. A selection box marks off the

selected area as you move the mouse. When you are finished, release the mouse button.

If you do not select an area of the graph to copy, the next step will copy the entire graph to the clipboard.

- 2 With the GRAPH window still active, press CTRL+C (or select **Copy to Paste Buffer** from the **Edit** menu).

This copies the graph to the clipboard. You can then return to the target application and paste the graph (typically by using the **Paste** or **Paste Special** options in the target OS/2 application). See the documentation for the target OS/2 application for more information about how to paste information from the clipboard.

Creating CGM Files for Export to Other Applications

You can export graphs from SAS/GRAPH to other graphics packages by using drivers that were developed specifically for those packages. When you use computer graphics metafiles (CGMs) as the medium of transport between packages, your graph retains its separate components so that you can independently edit and size it. The editing capabilities you can use depend on the target graphics package.

To create a CGM from SAS/GRAPH, set GOPTIONS as follows:

```
FILENAME fileref 'filename.CGM';
GOPTIONS DEVICE=CGMxxxx GSFNAME= fileref
          GSFMODE=REPLACE;
```

where CGMxxxx is the appropriate CGM driver for your target application, and filename.CGM is the name of the file that you want to create. Table 5.3 on page 118 lists the graphics packages to which you can export CGMs, the appropriate drivers to use, and the SAS documents that describe how to export file and use them with the target application. You access these documents from SAS Institute's Technical Support Division on the SAS Institute Web site.

The driver names that are marked with an asterisk (*) are already provided with Version 8 of the SAS System. For each driver that is not provided, the corresponding document describes how to build the driver.

Table 5.3 CGM Drivers and Documentation for Popular Graphics Packages

Package	Suggested Driver	Document
Aldus PageMaker	CGMAPMA*	TS-252F
Aldus Persuasion	CGMAPSA*	TS-252D
BPS 35 MM Express	CGM35	TS-252
Borland Quattro Pro (Windows)	CGMBQWC	TS-252J
Borland Quattro Pro (DOS)	CGMBQA*	TS-252
CorelDRAW 5	CGMCOR5L	TS-252R
Frame Tech FrameMaker	CGMFRCA* CGMFRGA* CGMFRMA* PSCFRAME PSGFRAME PSMFRAME	TS-252H
Harvard Graphics 2.12 for DOS	CGHHG	TS-252
Harvard Graphics 3.0 for DOS	CGMHG3A*	TS-252A
Harvard Graphics for Windows	CGMHGWA*	TS-252C

Package	Suggested Driver	Document
Harvard Graphics 3.0 for Windows	CGMHG3L	TS-252T
ImageBuilder	CGMIMG	TS-252
Interleaf 5	CGMCILFC* CGMGILFG* CGMMILFM* PSILEAFC PSILEAFG PSILEAFM	TS-252I
Lotus Ami Pro 3.0	CGMAM3C* CGMAM3G CGMAM3M	TS-252M
Lotus Ami Pro 2.0	CGMAMIA	TS-252
Lotus Freelance for DOS	CGMFLALJ* CGMFLAPL* CGMFLAPT*	TS-252
Lotus Freelance for Windows 2.0	CGMFL2C* CGMFL2G CGMFL2M	TS-252K
Lotus Freelance for Windows 1.0	CGMFLWA*	TS-252
Lotus 1-2-3 4.0	CGM123C*	TS-252N
Lotus 1-2-3	CGM123	TS-252
Lotus Office 97	CGMLOT97 CGMLT97P	TS-252Y
Microsoft Word for Windows 6.0	CGMMW6C* CGMMW6G CGMMW6M	TS-252L
Microsoft Word for Windows 2.0	CGMMWWC*	TS-252B
Microsoft PowerPoint	CGMMPPA	TS-252E
Microsoft Office 97	CGMOFF97 CGMOF97P	TS-252X
Polaroid CI3000	CI3000	TS-252
WordPerfect 5.1 for DOS	CGMWPCA CGMWPCAP* CGMWPGA CGMWPGAP* CGMWPMA CGMWPMAP*	TS-252G
WordPerfect 5.2 for Windows	CGMWPWA*	TS-252
WordPerfect 6.0 for Windows (Beta)	CGMWP6C CGMWP6G CGMWP6M	TS-252O
WordPerfect 6.0A for Windows	CGMWPGCA	TS-252P
WordPerfect 6.1 Windows	CGMWPGIL	TS-252S
WordPerfect 6.0 for UNIX	CGMWPUXL	TS-252U
WordPerfect Presents for DOS	CGMWPCA* CGMWPGA* CGMWPMA*	TS-252G
Zenographics Pixie	CGMPIX	TS-252

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