

Printing in SAS® Under OS/2® or Windows: A Tutorial

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Introduction

Version 6.08 of the SAS System, available under both OS/2 and Windows, contains features not present in Version 6.04 (the final DOS version) which facilitate the printing process. Two especially useful features are the ability to spool printed output to a printer object and the ability to print through a form. When running the SAS System under Version 6.08 in display manager printing is somewhat more when complex than under Version 6.04. In Version 6.08, SAS simply sends ASCII text to the printer, which by default, does not include any printer characteristics.

This paper presents a tutorial for printing under OS/2 and Windows. The tutorial will cover printer setup, printing through OS/2 or Windows print manager, printing through forms, and creating forms. The focus of the paper will be on the creation and use of forms. The paper will also note the enhancements that accompanied the two maintenance releases for version 6.08 of the SAS System.

Printing in SAS 6.08

All printing in SAS 6.08 is done through a form. A form is simply a template which describes printer attributes, such as lines per pages, orientation, or font size. In SAS 6.08, the contents of each window is a simple stream of text which does not include printer control codes such as page breaks or font characteristics.

Using the Default Form

If you do not set up a customized form, the SAS system will use a default form. In the initial production release of SAS 6.08 the

default form is set to 132 characters per line and 54 lines per page. In the second maintenance release (TS407) the default form was changed to have values of -99 for the characters per line and lines per page parameters. This indicates that the values for the SAS options LINESIZE and PAGESIZE will be used.

Creating Customized Forms

If you would like different configurations than the default, then you must create forms to reflect each of the desired settings. When creating a form, the number of lines per page and characters per line should be exactly the same as specified in the SAS options Pagesize and Linesize. Also, the number of lines per pages in the form should be the same as the number of lines per page the printer is set up for (this could be set in the printer control language panel described below).

If you are using the initial production release of SAS 6.08 or the first maintenance release (TS405) and you specify Pagesize=60 and your printer is set to 60 lines per page and you print without setting up a form, the output from the printer will come out with 54 lines on the first page and 6 lines on the second page. This is because the SAS System is using the default form.

Printer Setup

The first consideration when printing under display manager is the printer setup configuration. To review the list of printer drivers and their port locations, use the SAS AWS menu to select

'File' -> 'Printer Setup'. This will bring up the Printer Setup dialog box (Figure 1). Whichever printer is highlighted is your SAS default printer. SAS looks for the default printer in the following places in order of precedence: 1) the SYSPRINT system option; 2) the SASPRINT.INI file; and 3) the system default printer. The Sysprint device name and Sysprint print name fields can be altered to send your output to a port or printer other than the default. The default can also be changed by using the SYSPRINT system option.

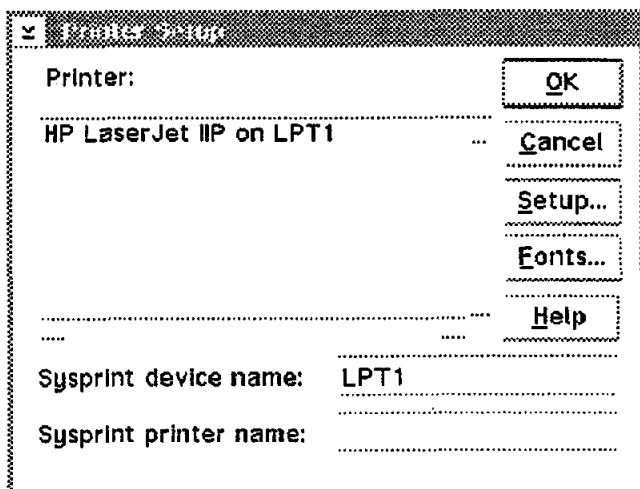


Figure 1. Printer Setup Dialog Box

Once the default printer is chosen, the way it is configured is dependent upon the method by which output will be sent to the printer. To print by-passing print manager, delete the value shown in the Sysprint printer name field. You can also specify the SAS system option Sysprint with only the first argument to by-pass print manager, as in the following statement:

```
options sysprint='lpt1:' ;
```

If the printer driver argument is not specified, a printer object is not used. The printer object should be by-passed if you are printing through a form that contains printer control characters, such as those that control the orientation or the fonts.

To print through print manager, the printer driver must be specified. In this case, the value shown in the Sysprint printer field should not be deleted. The Sysprint system option can also be used to route output to a printer object, as in the following example:

```
options sysprint='lpt1:'  
          'HP LaserJet Series II';
```

When printing through print manager there are some additional setup options available. You can click on SETUP to display and edit printer attributes supported by your default printer. The dialog box that is displayed is dependent on the print driver and operating system. Printer attributes that can be selected include orientation, number of copies, and performance options.

Beginning with maintenance release TS405, you can click on FONTS. This displays a list of available fonts. You can choose a font, font style (i.e. bold), and font size.

Once you have completed setting the printer options, click on OK to save your configuration and close the Printer Setup dialog box.

It is also possible to print through printer manager and to by-pass print manager in the same session. You can use the options statements shown above or the Printer Setup dialog box to change the value of the Sysprint option.

The Printing Process

Once printer setup is complete, the printing process is similar for both of the printing methods described above.

1. From the DMS window that you would like to print, use the popup menu to select 'File' -> 'Print' -> 'Print File'. This will bring up the Print dialog box (Figure 2.). This box can also be displayed by making the

desired DMS window active and selecting the AWS menu items 'File' -> 'Print'.

2. In the Default Destination box you should see the port that the printer is attached to, such as LPT1. If you are printing through print manager, the Default Printer field should show the printer you have chosen in printer setup. If you are by-passing print manager, this field should be blank (as shown in Figure 2).
3. You can route your printed output to a file, by selecting the Alternate Destination button and specifying a filename. By saving the contents of a window in the Print dialog box, you can ensure that the file will contain all the desired printer control information. When the contents of a window is saved using 'File' -> 'Save as', the file will not be formatted with regard to page size or page ejects.
4. If you have defined print forms, click on the arrow in the Formname field to display the available forms. Then click on the form name desired. If you do not select a form, the default form will be used. Once a form is selected, it becomes the default form for the duration of the current SAS session.

5. Click on OK to print the file.

Notes on Printing Through Print Manager

1. If you print through a form that contains printer control characters you must by-pass print manager. Print manager will interpret them as text to be printed.
2. When using this method, SAS output can be managed as any other output under OS/2 or

Windows. You can hold jobs, delete queued jobs, change the priority or jobs, and monitor the queue.

3. A print job can be held by selecting Hold Print Requests from the Print dialog box. The job will be held until you choose 'File' -> 'Release Print Requests' from the SAS AWS pull down menu. A job can also be held by changing the status to 'Hold' on the OS/2 or Windows printer object. This causes all jobs to be held until the status on the printer object is changed to 'Release'.
4. You can click on SETUP or FONTS as in the Printer Setup dialog box to select printer attributes and a font type and size.

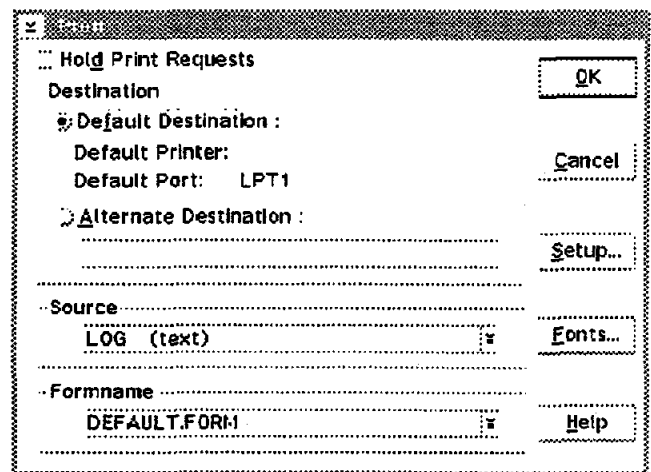


Figure 2. Print Dialog Box

Creating Forms in OS/2 or Windows

Customized Forms can be created using the FORM window. The FORM window consists of six screens that allow you to create a catalog entry for a specified printer and host system. Information on linesize, pagesize, orientation, font type and size, printer margins, and printer control language can be specified.

You can create or edit a form by selecting 'File' -> 'Print' -> 'Open a Form' from the popup menu

of any window. This will invoke the Open a Form window. Specifying a libname or catalog name is optional. By Default, the form is stored in SASUSER.PROFILE. If you choose to specify a catalog name that is associated with a permanent library, the form will be saved in that library. In the form name field, enter the name of a form to be edited or the name of a new form to create. You can click on the DEFAULT button to make this form the default form. Click on the OK button to begin editing the form. You can also create or edit a form by typing `FSFORM formname` on the command line of any window (where *formname* is the name of the form that you would like to create or edit).

When creating a new form, the Printer Selection frame is the first frame to appear. This window only appears when creating a new form. Move your cursor to the printer that best matches the one you are using and press ENTER. Your selection will take effect and the Text Body and Margin Information frame is displayed (Figure 3.). It should be noted that once you have made your printer selection, you cannot return to this frame.

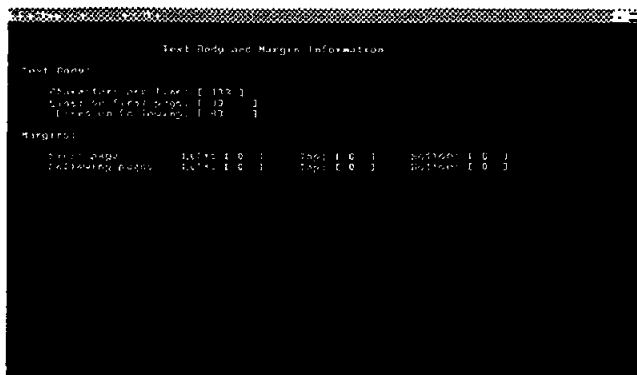


Figure 3. Text Body and Margin Information Frame

When editing an existing form, the Text Body and Margin Information frame is the first frame to appear. In this frame you can specify page formats by editing the following fields:

Characters per line specifies the number of characters to print across the pages. Characters per line should be determined by the horizontal printing area of your paper and font size.

Lines on first page specifies the number of lines to print on the first page.

Lines on following specifies the number of lines to print on pages that follow the first page.

The number of lines on the first page and the pages that follow should be based on the vertical area of your paper and font size. You may have to experiment with this field.

First page and Following Page margin specify the top, bottom, and left margins for the first page and all additional pages. The number of characters per line determines the right margin. By default the top, bottom, and left margins have been set to zero. If a number other than zero is specified, that number is added to the default margin position of the printer.

You can obtain information on the acceptable values for any of the fields in this frame by typing '?' in the field and pressing enter.

To get to frame #3, the Carriage Control Information frame (Figure 4.), select 'Locals' -> 'Next Screen' from the popup menu. In this frame you can specify whether you want carriage control information included with the output and where you want page breaks.

The generate Carriage Control Information field allows you to specify whether you want to include information about page breaks. If you want to include information about page breaks, place your cursor on the YES field and press ENTER. To remove carriage control characters, position the cursor on the NO

field and press ENTER. If you chose the NO option, the signal page skip parameters are ignored.

If carriage control characters are being generated, you can specify where you want page breaks and other carriage control information. Page skips can be generated in any or all of the following places:

Printer initialization
before any printer control characters are sent to the printer to initialize the printer.

First Text Page
before the first page of text is printed. This field must be selected for any form that contains printer control codes.

Following Printer Control Statements
before any printer control language is sent for following pages of text.

Following Text Pages
before the following text pages are printed.

To select a field, position the cursor on any of the fields and press ENTER. An asterisk(*) should appear to the left of the field. To deselect a field place your cursor on the field again and press ENTER. The asterisk should disappear.



Figure 4. Carriage Control Information Frame

Select 'Locals' -> 'Next Screen' to get the next frame, the Print

File Parameters frame(Figure 5.). This frame enables you to specify print file information based on the host system and printer selected.

The Hold print request checkbox can be used to hold a print request. You can receive information on the acceptable values of any of the other fields by typing a question mark(?) in the field and pressing ENTER.

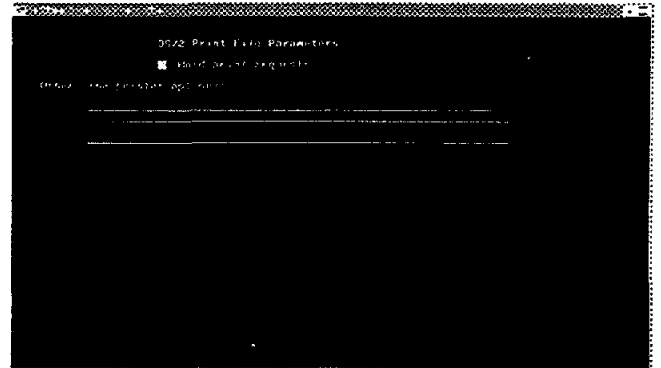


Figure 5. Print File Parameters Frame

You can display the Font Control Information frame(Figure 6.) by selecting 'Locals' -> 'Next Screen'. The attributes defined in this frame are based on the printer you selected in the Printer Selection window. There are two parts to this frame. The control character definition fields(top part) has spaces for you to define up to eight special characters that are used to represent printer control characters. These characters are used both in the bottom portion of the frame to define text attributes and in the next frame to define printing modes. You can make changes to any of the fields in this frame by positioning your cursor on the field you want to edit, then typing in the field. You can receive information on the acceptable values for any field in this frame by placing your cursor on the field and pressing ENTER.

Printer control characters are characters (typically non-printing) that signal to the printer that the text following

the control character is a printer command. In these fields, you can choose a printing character to use in your form definition that SAS will translate into the special printer control character. By default, SAS uses the tilde(~) to represent the ESC keys and the caret(^) to represent the CTL key. If your printer uses other characters as control characters, they can be defined in this section. For each control character that you define, specify the special character, its decimal representation, and a description.

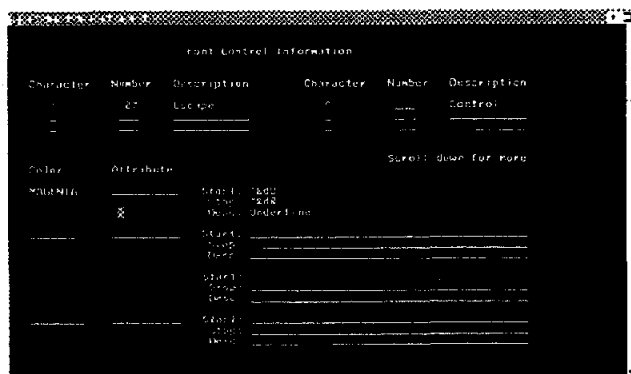


Figure 6. Font Control Information Frame

The lower part of the font control information frame allows you to associate a color and/or attribute (e.g., highlight, underline) with a control code used by your printer for printing in special mode (e.g., italic, bold). In figure 6, the color magenta is associated with the text attribute underline. For Example if you wanted to underline a title, select 'View' -> 'Colors' -> 'Title' from the popup menu of the output window. Then click on the button to the left of MAGENTA and click on OKAY. When the contents of the Output window is printed, titles will be underlined.

SAS supplies some default text attribute definitions with the correct start and stop sequences for each special printing mode supported by the printer that you have selected. To specify

additional text attributes, enter the color and/or attribute. The Start field is the printer control sequence required by your printer to turn the printing mode on. The Stop field is the printer control sequence required by your printer to turn the printing mode off. The Description field can be used to document the printing mode you are specifying.

Select 'Locals' -> 'Next Screen' to get to the final frame, the Print Control Language Frame (Figure 7.). Here you can enter control sequences that are sent to the printer. You can send control language sequences before text is sent, in between pages of text, and after all text is sent. This frame is especially useful for formatting the contents of a window without having to manually adjust your printer settings or SAS Setup and Font options.

The Printer Control Language frame is a text editor frame and all text editor commands can be used in it.

The Printer Control language frame can be used to set the page orientation, the font type, the font size, the number of characters per line, or other print characteristics. Your printer manual describes the control languages sequences that you need to specify. Your printer manual should also describe the order which the control codes should be sent to the printer. Your printer will not respond correctly if all items are not ordered correctly.

To tell the printer when to use a control language sequence the following labels should be used. Each Label should be placed a line by itself before the sequence it sends.

PRINT INIT

sends control language sequences that follow before sending any text to the print file.

