SAS® Viya® 3.5 Universal Printing
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About Examples and Sample Data Sets

This document includes examples that illustrate some of the features of a statement or system option. The output that is shown for the examples was generated from SAS Studio running in a Linux operating environment.

Many examples process sample data contained in a SAS data set stored in the Sashelp library. The documentation for each example provides the data set name used. To see a brief description of any SAS data set in the Sashelp library, as well as output displaying the first five observations in each data set, please refer to Sashelp Data Sets.

Recommended Reading

Here is the recommended reading list for this title:

- Batch and Line Mode Processing in SAS Viya
- Learning SAS by Example
- Output Delivery System: The Basics and Beyond
- SAS System Options: Reference
- SAS Data Set Options: Reference
- SAS Functions and CALL Routines: Reference
- SAS DATA Step Statements: Reference
- Base SAS Procedures Guide
- The Little SAS Book: A Primer, Fifth Edition
PART 1

Universal Printing in SAS

Chapter 1
Printing in SAS Viya
Universal Printing

What Is Universal Printing?

Universal Printing is a system that enables you to create a variety of document and graphic output formats programmatically. For example, you can use Universal Printing to create HTML files or PDF and RTF documents.

Universal Printing enables you to define printers and to set options to control the printed output. In addition to creating the various document and graphic output types, you can send output to a printer.

SAS routes all printing through Universal Printing services. All Universal Printing features are controlled by system options, thereby enabling you to control many print features, even in batch mode. For more information about these system options, see “About SAS System Options” on page 45.
In SAS Studio, printing is also available through a browser by selecting the print icon.

Setting Up the Universal Printing Interface and the Default Printing Environment

Universal Printing in UNIX

Universal Printing is enabled when SAS starts in the Linux operating environment. No further action is required.

Return to the Default Printer

When you use the PRINTERPATH= system option to specify a printer, the print job is controlled by Universal Printing. In SAS Studio, the PRINTERPATH= system option value is PDF.

```plaintext
options printerpath="";
```

Universal Printing Output Formats

In addition to sending print jobs to a printer, you can also direct output to external files that are widely recognized by different types of printers and software programs. You can use Universal Printing to produce a PDF file type in SAS Studio. SAS Studio also supports the HTML and RTF ODS destinations, either of which might use a universal printer.

You set the value of the PRINTERPATH= system option to a Universal Printer or use ODS statements to create output in one of the above formats. When the PRINTERPATH= system option is set to a printer that prints to a file, the default filename is sasprt.extension. extension is the printer format type. An example is sasprt.pdf. The file is written to the current directory. In SAS Studio, you must specify the path and the filename where the output file is to be written.

You can use the PRINTERPATH= system option to change the location and the name of the file. Here is an example:

```plaintext
options printerpath=(pdf out);
filename out 'c:\myimages\graph1.pdf;
```

Viewing Universal Printers and Printer Prototypes

SAS provides Universal Printers and printer prototypes that you can use to create your own printers. You can access the list of available printers from the Print dialog box. You can also use the QDEVICE procedure to create a data set of printers and then print the printer information using the PRINT procedure.
To create a table of printers and print the list with a description of each printer, submit this code:

```sas
proc qdevice out=printers;
   printer _all_;
run;
```

```sas
proc print data=printers;
   var name desc;
run;
```

**For more information, see “QDEVICE Procedure” in Base SAS Procedures Guide.**

To print a list of printer prototypes to the SAS log, submit this SAS program:

```sas
filename registry temp;
proc printto log=registry;
run;
```

```sas
proc registry list keysonly levels=1 startat="core\printing\prototypes";
proc printto;
run;
```

```sas
data protypes;
   keep prototype;
   infile registry lrecl=300 pad;
   length line $300;
   input line $300.;
   if substr(line,1,1) = "[
      then do;
         prototype = strip(substr(line,2,length(line)-2));
         if index(prototype,'core\printing\prototypes') ne 0
            then delete;
         else
            output;
      end;
   run;
```

```sas
proc print label;
   label prototype = "Prototype";
run;
```

**For more information, see “REGISTRY Procedure” in Base SAS Procedures Guide.**

### Viewing Universal Printer Settings

You can use the QDEVICE procedure or the Print dialog box to view the settings of a Universal Printer. To view printer settings using the QDEVICE procedure, submit this code:

```sas
proc qdevice;
   printer printer-name;
run;
```

Here are the printer settings for the GIF printer:

**Universal Printing**

5
proc qdevice;
   printer gif;
run;

Name: GIF
Description: Graphics Interchange Format RGB Color/Alpha Blending
Module: SASPDGIF
Type: Universal Printer
Registry: SASHELP
Prototype: GIF
Default Typeface: Cumberland AMT
Typeface Alias: Courier
   Font Style: Regular
   Font Weight: Normal
   Font Height: 8 points
   Font Version: Version 1.03
Maximum Colors: 16777216
Visual Color: True Color
Color Support: RGBA
Destination: sasprt.gif
   I/O Type: DISK
Data Format: GIF
   Height: 6.25 inches
   Width: 8.33 inches
   Ypixels: 600
   Xpixels: 800
   Rows [vpos]: 50
   Columns [hpos]: 114
   Left Margin: 0 inches
   Minimum Left Margin: 0 inches
   Right Margin: 0 inches
   Minimum Right Margin: 0 inches
   Bottom Margin: 0 inches
   Minimum Bottom Margin: 0 inches
   Top Margin: 0 inches
   Minimum Top Margin: 0 inches
   XxY Resolution: 96x96 pixels per inch
Compression Enabled: Always
Compression Method: LZW
Font Embedding: Never
Animation: Enabled

The QDEVICE procedure does not report all printer settings. For a description of the printer settings that can be reported, see “QDEVICE Procedure” in Base SAS Procedures Guide.

Modifying Universal Printing Printer Settings

You modify printer settings by setting SAS system options or by using the PRTDEF procedure. See the following topics:

- To configure Universal printing with a programming statement, see “About SAS System Options” on page 45.
- See “Managing Universal Printers Using the PRTDEF Procedure” on page 17 to configure Universal printing.
Universal Printing and ODS

The ODS PRINTER statement can use Universal Printing whether the UNIVERSALPRINT or NOUNIVERSALPRINT system option is set. The PRINTER destinations used by the ODS PRINTER statement are described in the "ODS PRINTER Statement" in SAS Output Delivery System: User's Guide.

The Output Delivery System (ODS) uses Universal Printing for the following ODS statements.

Table 1.1 ODS Statements That Use Universal Printing

<table>
<thead>
<tr>
<th>ODS Statement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document Formats</td>
<td></td>
</tr>
<tr>
<td>ODS PRINTER PRINTER= option</td>
<td>Uses the selected printer.</td>
</tr>
<tr>
<td>ODS PDF statement</td>
<td>Uses the Universal Printing PDF printer.</td>
</tr>
<tr>
<td>ODS HTML</td>
<td>Use with ODS Graphics and SAS/GRAPH.</td>
</tr>
<tr>
<td>ODS HTML5</td>
<td>Use with ODS Graphics and, if installed, SAS/GRAPH.</td>
</tr>
<tr>
<td>ODS RTF</td>
<td>Use with ODS Graphics and, if installed, SAS/GRAPH.</td>
</tr>
</tbody>
</table>

1 You must have SAS/GRAPH installed to create drill-down regions in a graph created by the PDF Universal Printer. For more information, see “Adding Drill-Down Graphs in Your PDF File” in SAS/GRAPH: Reference.

Windows Specifics: In the Windows operating environment, the ODS PRINTER destination uses the Windows system printers unless SAS is started with the UNIVERSALPRINT system option, or when you specify a printer with the PRINTERPATH= system option. If Universal Printing is enabled in Windows, SAS overrides the use of the Windows system printer and causes ODS to use Universal Printing. To return to Windows printing, set the PRINTERPATH= system option to a null string: PRINTERPATH="" (double quotation marks with no space between them).

For more information about ODS, see SAS Output Delivery System: User’s Guide.

Specifying the Page Orientation for Universal Printing Documents

You can specify the page orientation for each page of a multiple-page document that is created by a Universal Printer. You can also use page orientation for documents that are created for the ODS PDF destination.
The ORIENTATION= system option has four values: PORTRAIT, LANDSCAPE, REVERSEPORTRAIT, and REVERSELANDSCAPE. To change the orientation of a document page, specify the OPTIONS statement, using the ORIENTATION= system option, between the steps that create output to change the page orientation.

```sas
options nodate nonumber;
ods printer printer=svgview file='orientation.svg' style=Ocean;
title 'Demonstration of Page Orientation Changes in a Document';
footnote 'PROC SGLOT in Landscape Orientation';
   options orientation=landscape;
   proc sgplot data=sashelp.class;
      vbar age;
   run;

   options orientation=portrait;
   footnote 'PROC PRINT in Portrait Orientation';
   proc print data=sashelp.class;
   run;

   options orientation=landscape;
   footnote 'PROC SGSCATTER in Landscape Orientation';
   proc sgscatter data=sashelp.cars;
      matrix mpg_city enginesize horsepower /
         diagonal=(histogram kernel);
   run;

   options orientation=portrait;
   footnote 'PROC MEANS in Portrait Orientation';
   proc means data=sashelp.cars n mean;
      var  mpg_city enginesize horsepower;
   run;
ods printer close;
```

For more information, see “ORIENTATION= System Option” on page 56.

---

**Color Support for Universal Printers**

**Universal Printers and the Color Spaces They Support**

All Universal Printers support 24-bit RGB colors. Most printers support 32-bit CMYK colors or 32-bit RGBA (transparency) colors. The following table lists the Universal Printers and their respective color support.

**Table 1.2  Color Support for Universal Printers**

<table>
<thead>
<tr>
<th>Universal Printer</th>
<th>Color Support</th>
<th>Supports Transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDF</td>
<td>CMYK and RGBA</td>
<td>Yes, for RGBA colors</td>
</tr>
</tbody>
</table>
CMYK Colors

CMYK colors setting specify eight hexadecimal characters with a value of 0–255 to specify the amount of cyan, magenta, yellow, and black ink. Use your printer’s Pantone Color Lookup table to find the CMYK values for your printer. If you specify an unsupported color, such as a CMYK color with an EMF printer, the color is converted to a color that is supported.

You can specify CMYK colors where ever colors can be set (for example, in the PROC PRINT statement STYLE option or in the TITLE statement).

Preface the hexadecimal number with a CMYK or a K. Here are some examples of CMYK colors that you can set in SAS:

Table 1.3 Example CMYK Colors

<table>
<thead>
<tr>
<th>Hexadecimal Representation</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>cmykFF000000</td>
<td>cyan</td>
</tr>
<tr>
<td>k00FF0000</td>
<td>magenta</td>
</tr>
<tr>
<td>cmyk0000FF00</td>
<td>yellow</td>
</tr>
<tr>
<td>kFFFF0000</td>
<td>blue</td>
</tr>
<tr>
<td>cmykFF00FF00</td>
<td>green</td>
</tr>
<tr>
<td>k00FFFF00</td>
<td>red</td>
</tr>
<tr>
<td>cmykFFFFFFFF00</td>
<td>process black, using cyan, magenta, and yellow</td>
</tr>
<tr>
<td>k000000FF</td>
<td>black</td>
</tr>
</tbody>
</table>

The first byte of the hexadecimal number represents cyan. The second byte represents magenta. The third byte represents yellow. The fourth byte represents black.
This example uses the STYLE option to set the column background color to magenta and sets the foreground color to white. The TITLE statement sets the output title to blue.

```sas
options obs=5 nodate;
odds html close;
odds pdf;
proc print data=sashelp.demographics label
  style(header)={background=cmyk00ff0000 foreground=k00000000} noobs;
  var name pop;
  label name=Country Name pop=Population;
  title color=kffff0000 'Demographics 2005';
run;
odds pdf close;
odds html;
```

Figure 1.1  CMYK Color Specified in the STYLE Option

**RGB and RGBA Colors**

RGB and RGBA colors combines red, green, and blue colors in different ratios to create colors. The A is the alpha channel, which represents a percentage of opacity.

You specify RGB colors as a triple of hexadecimal numbers, ranging from 00–FF, Each hexadecimal number indicates how much of the red, green, or blue is included in the color. RGBA color includes an additional hexadecimal number for the alpha channel that indicates how transparent the color is. FF is opaque and 00 is transparent. In both RGB and RGBA color specifications, the first hexadecimal number is red, the second, is green, and the third is blue. In RGBA colors, the fourth hexadecimal number is the alpha channel specification.

You can specify RGB and RGBA colors where ever colors can be set. For example, set colors as an option in the VBAR statement in the SGPLOT procedure or in the
TITLE statement. For RGB colors, preface the hexadecimal number with a CX. For RGBA colors, preface the hexadecimal number with RGBA or A.

The following SGPLOT procedure uses an RGBA color to create the bar labels:

```plaintext
dohtml close;
doprinter printer=png;
proc sgplot data=sashelp.stocks (where=(date >= "01jan2000"d
and date <= "01jan2001"d
and stock = "IBM"));
title color=a6495edff "Stock Volume vs. Close";
vbar date / response=volume
dataxlabel
dataxlabelatts=(color=a8a44ff8a size=10);
vline date / response=close y2axis;
run;
title;
doprinter close;
dohtml;
```

Here is the PNG file with bar labels:

**Figure 1.2** RGBA Color Specified for the Bar Labels
Example: Static and Varying Background Color in a Table Using RGBA Colors

This example program does the following:

- Creates the format PCT. using a DATA _NULL_ statement. The DATA step defines salary ranges of $3,000.00 and calculates an RGBA color value for each salary range. The CALL EXECUTE statement is used to display the FORMAT procedure code as it is generated.
- Creates a data set.
- The PRINT procedure uses an RGBA color value for the background of the table header and formats the salary variable using the PCT. format.

```sas
options nodate;
/* Create the PCT format. */
/* The color variable is a concatenation of calculated */
/* hexadecimal values. */

data _null_;  
call execute('proc format fmtlib ; value pct');
max=10000;
maxloop=255;
do i=1 to maxloop by 10;
  color='RGBA'||put(((maxloop)/(maxloop+i)*200),hex2.)
    ||put(((maxloop)/(maxloop+i)*235),hex2.)
    ||put(((maxloop)/(maxloop+i)*255),hex2.)||'95';
  from=max;
to=(max+3000);
  max=max+3000;
/* Create salary ranges of $3000.00 equal to the calculated RGBA color value.*/
call execute(put(from,best.)||'-'||put(to,best.)||'='||quote(color));
end;
/* Create RGBA values for missing values and values outside the salary ranges. */
call execute('.="RGBAF7F5F0480" other="RGBAFF2A2A88"; run;');
run;

data staff;
  infile datalines dlm='#';
  input Name $16. IdNumber $ Salary Site $ HireDate date7.;
  format hiredate date7.;
datalines;
Capalleti, Jimmy# 2355# 21163# BR1# 30JAN09
Chen, Len# 5889# 20976# BR1# 18JUN06
Davis, Brad# 3878# 19571# BR2# 20MAR84
Leung, Brenda# 4409# 34321# BR2# 18SEP94
Martinez, Maria# 3985# 49056# US2# 10JAN93
Orfali, Philip# 0740# 50092# US2# 16FEB03
Patel, Mary# 2398# 35182# BR3# 02FEB90
Smith, Robert# 5162# 40100# BR5# 15APR66
Sorrell, Joseph# 4421# 38760# US1# 19JUN11
Zook, Carla# 7385# 22988# BR3# 18DEC10
```

run;
ods html close;
ods pdf file='outpdf.pdf';
proc print data=staff noobs label
   style(HEADER)={background=rgbac7eafe95 fontstyle=italic}
   style(DATA)={foreground=black};
var name IdNumber ;
var salary /style(DATA)={background=pct.};
label IdNumber='Employee Number' salary='Salary in U.S. Dollars';
format salary dollar7.;
title 'Generated Colors for the Variable Salary';
run;
ods pdf close;

**Example Code 1.1** Static and Varying Background Color in a Table Using RGBA Colors

```plaintext
options nodate;
/* Create the PCT format.                                */
/* The color variable is a concatenation of calculated   */
/* hexadecimal values.                                   */
data _null_ ;
call execute('proc format fmtlib ; value pct');
max=10000;
maxloop=255;
do i=1 to maxloop by 10;
   color='RGBA'||put(((maxloop)/(maxloop+i)*200),hex2.)||put(((maxloop)/(maxloop+i)*235),hex2.)||put(((maxloop)/(maxloop+i)*255),hex2.)||'95';
   from=max;
   to=(max+3000);
   max=max+3000;
/* Create salary ranges of $3000.00 equal to the calculated RGBA color value.*/
call execute(put(from,best.)||'-'||put(to,best.)||'='||quote(color));
end;
/* Create RGBA values for missing values and values outside the salary ranges. */
call execute('.="RGBAF7F5F0480" other="RGBAFF2A2A88"; run;');
run;
NOTE: DATA statement used (Total process time):
   real time           0.00 seconds
   cpu time            0.00 seconds
```
NOTE: CALL EXECUTE generated line.
proc format fmtlib;
  value pct
    10000-13000="RGBAC7EAFE95"
    13000-16000="RGBABFE1F495"
    16000-19000="RGBAB8D9EB95"
    19000-22000="RGBAB2D1E395"
    22000-25000="RGBAAACCADB95"
    25000-28000="RGBAA6C3D495"
    28000-31000="RGBAA1BDCD95"
    31000-34000="RGBAB8C7C795"
    34000-37000="RGBAB7B2C195"
    37000-40000="RGBAB3ADBB95"
    40000-43000="RGBAB8FAAB695"
    43000-46000="RGBAB8BA3B195"
    46000-49000="RGBAB89FAC95"
    49000-52000="RGBAB89BA895"
    52000-55000="RGBAB897A495"
    55000-58000="RGBAB7D93A095"
    58000-61000="RGBAB7A909C95"
    61000-64000="RGBAB778C9895"
    64000-67000="RGBAB7489995"
    67000-70000="RGBAB72869195"
    70000-73000="RGBAB6F838E95"
    73000-76000="RGBAB6D808895"
    76000-79000="RGBAB6B8D8895"
    79000-82000="RGBAB687B8595"
    82000-85000="RGBAB6678395"
    85000-88000="RGBAB64768095"
    .="RGBAF7F5F0480" other="RGBAFF2A2A88";
NOTE: Format PCT has been output.
run;

PROCEDURE FORMAT used (Total process time):
real time 0.03 seconds
cpu time 0.01 seconds

data staff;
  infile datalines dlm='\#';
  input Name $16. IdNumber $ Salary Site $ HireDate date7.;
  format hiredate date7.;
datalines;

NOTE: The data set Work.Staff has 10 observations and 5 variables.

DATA statement used (Total process time):
real time 0.01 seconds
cpu time 0.01 seconds

run;
/* Close the HTML destination and open the PDF destination. */
/* Format the header background using an RGBA color.     */
/* Use the PCT. format to format the salary variable.     */
ods html close;
ods pdf file='outpdf.pdf';
NOTE: Writing ODS PDF output to DISK destination "c:\public\mySASPrograms
\outpdf.pdf",
       printer "PDF".
proc print data=staff noobs label
  style(HEADER)={background=rgbac7eafe95  fontstyle=italic}
  style(DATA)={foreground=black};
  var name IdNumber ;
  var salary /style(DATA)={background=pct.};
  label IdNumber='Employee Number' salary='Salary in U.S. Dollars';
  format salary dollar7.;
  title 'Generated Colors for the Variable Salary';
run;
NOTE: There were 10 observations read from the data set Work.Staff.
NOTE: PROCEDURE PRINT used (Total process time):
       real time           0.03 seconds
       cpu time            0.03 seconds
ods pdf close;
NOTE: ODS PDF printed 1 page to c:\public\mySASPrograms\outpdf.pdf.
ods html;
NOTE: Writing HTML Body file: sashtml7.htm

Here is the formatted PDF output:
You can embed a comment in Universal Printer output that does not appear in the output when the file is displayed or printed. The comment can be a text string up to 4,000 characters that you specify using the COLOPHON= system option. You might want to use the comment as a digital signature or to identify the image, vector graphic, or PDF file. You can use a text editor or a third-party application to view the text string in the file.

```sas
options printerpath=svg colophon='Colophon text: SVG SGPLOT for sashelp.class';
ods html close;
ods printer;
proc sgplot data=sashelp.class;
   reg x=height y=weight / CLM CLI;
run;
ods printer close;
ods html;
```

For more information, see “COLOPHON= System Option” on page 49.
Managing Universal Printers Using the PRTDEF Procedure

About Using the PRTDEF Procedure

Printer definitions can be created for an individual or for all SAS users at a site by using the PRTDEF procedure. The PRTDEF procedure can be used to do many of the same printer management activities that you can do with the Universal Printing windows. The PRTDEF procedure can be used in any execution mode, but it is especially useful if you use SAS in batch mode, where the Universal Printing windows are unavailable.

To define or modify one or more printers with the PRTDEF procedure, you first create a SAS data set that contains variables that correspond to printer attributes. These four variables must be specified for every printer destination:

- `DEST`: specifies the printer destination.
- `DEVICE`: specifies the device name.
- `MODEL`: specifies the name of a printer prototype. For a list of printer prototypes, open the SAS registry to this key: `\CORE\PRINTING\PROTOTYPES`.
- `NAME`: specifies the name of the printer.

For a list of optional variables, see “PROC PRTDEF Statement” in *Base SAS Procedures Guide*. The PRTDEF procedure reads the data set and converts the variable attributes into one or more printer definitions in the SAS registry.

After you create the printer definition data set, you run the PRTDEF procedure to create the printer.

Only system administrators or others who have Write permission to the Sashelp library can use the PRTDEF procedure to create printer definitions for all SAS users at a site. Individuals have Write permission to their Sasuser library and can use the PRTDEF procedure to create their own printers. However, the printer definition is stored in the Sasuser library and is lost if the Sasuser library is deleted. Printer definitions that are created by individuals are available only when the directory where the printer definition is stored is specified as the Sasuser library. For information about assigning the Sasuser library, see “SASUSER= System Option” in *SAS System Options: Reference*.

For more information see, “PRTDEF Procedure” in *Base SAS Procedures Guide*. 
Introduction

These examples show you how to use the PRTDEF procedure to define new printers and to manage your installed printers and previewers.

After a program statement containing the PRTDEF procedure runs successfully, the printers or previewers that have been defined appear in the Print Setup window. A complete set of all available printers and previewers appear in the Printer name list. Printer definitions can also be viewed in the Registry Editor window under CORE \PRINTING\PRINTERS.

Creating a Data Set That Defines Multiple Printers

When you create a data set to use with the PRTDEF procedure to define a printer, you must specify the name, model, device and, destination variables.

See the “PRTDEF Procedure” in Base SAS Procedures Guide in Base SAS Procedures Guide for the names of the optional variables that you can also use.

The following code creates a data set to use with the PRTDEF procedure:

data printers;
  input name $15. model $35. device $8. dest $14.;
  datalines;
  Myprinter      PostScript Level 1 (Gray Scale)     PRINTER printer1
  Laserjet       PCL 5 PCL 5e (RunLength)           PIPE    lp -dprinter5
  Color LaserJet PostScript Level 2 (Color, Duplex) PIPE    lp -dprinter2
;run;

proc print data=printers;
run;

Here is the output:

**Output 1.2 The Printer Data Set**

<table>
<thead>
<tr>
<th>Obs</th>
<th>name</th>
<th>model</th>
<th>device</th>
<th>dest</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Myprinter</td>
<td>PostScript Level 1 (Gray Scale)</td>
<td>PRINTER</td>
<td>printer1</td>
</tr>
<tr>
<td>2</td>
<td>Laserjet</td>
<td>PCL 5 PCL 5e (RunLength)</td>
<td>PIPE</td>
<td>lp -dprinter5</td>
</tr>
<tr>
<td>3</td>
<td>Color LaserJet</td>
<td>PostScript Level 2 (Color, Duplex)</td>
<td>PIPE</td>
<td>lp -dprinter2</td>
</tr>
</tbody>
</table>
After you create the data set containing the variables, you run the PRTDEF procedure. The PRTDEF procedure creates the printers that are named in the data set by creating the appropriate entries in the SAS registry.

```
proc prtdef data=printers usesashelp replace;
run;
```

The USESASHELP option specifies that the printer definitions are to be placed in the Sashelp library, where they are available to all users. If the USESASHELP option is not specified, then the printer definitions are placed in the current Sasuser library, where they are available to the local user only. The printers that are defined are available only in the local Sasuser directory. However, to use the USESASHELP option, you must have permission to write to the Sashelp library.

The REPLACE option specifies that the default operation is to modify existing printer definitions. Any printer name that already exists is modified by using the information in the printer attributes data set. Any printer name that does not exist is added.

**Creating a Printer for Multiple Users**

This example creates a Tektronix Phaser 780 printer definition that specifies to use Ghostview as the preview application and to store the printer definition in the Sashelp library. The bottom margin is set to two centimeters, the font size to 14 point, and the paper size to ISO A4.

```
data tek780;
  name = "Tek780";
  desc = "Test Lab Phaser 780P";
  model = "Tek Phaser 780 Plus";
  device = "PRINTER";
  dest = "testlab3";
  preview = "Ghostview";
  units = "cm";
  bottom = 2;
  fontsize = 14;
  papersiz = "ISO A4";
run;
```

```
proc prtdef data=tek780 usesashelp;
run;
```

---

**Note:** To preview output for this printer, you must create a Ghostview printer definition. You can do this by using the PRTDEF procedure.

---

Here is a Ghostview printer definition using the PRTDEF procedure:

```
data gsview;
  name = "Ghostview";
  desc = "Print Preview with Ghostview";
  model = "Tek Phaser 780 Plus";
  viewer = 'gv $s';
  device = "dummy";
  dest = "";
run;
```

```
proc prtdef data=gsview list replace usesashelp;
run;
```
The PROC PRTDEF statement LIST option specifies to write the printer definition to the log.

Adding, Modifying, and Deleting Printers

This example uses the Printers data set to add, modify, and delete printer definitions. See the “PRTDEF Procedure” in *Base SAS Procedures Guide* for more variables that you can use to define a printer. The following list describes the variables used in the example:

- The MODEL variable specifies the printer prototype to use when defining this printer.
- The DEVICE variable specifies the type of I/O device to use when sending output to the printer.
- The DEST variable specifies the output destination for the printer.
- The OPCODE variable specifies what action (Add, Delete, or Modify) to perform on the printer definition.

The first Add operation creates a new printer definition for Color PostScript in the registry and the second Add operation creates a new printer definition for ColorPS in the registry.

The Mod operation modifies the existing printer definition for LaserJet 5 in the registry.

The Del operation deletes the printer definitions for printers named “Gray PostScript” and “test” from the registry.

The following example creates a printer definition in the Sashelp library. Because the definition is in Sashelp, the definition becomes available to all users. Special system administration privileges are required to write to the Sashelp library. An individual user can create a personal printer definition by specifying the Sasuser library instead.

```sas
data printers;
  infile datalines dlm='#';
  length name $ 80
  model $ 80
  device $ 8
  dest $ 80
  opcode $ 3;
  input opcode $ name $ model $ device $ dest $;
  datalines;
  add#  Color PostScript F2#  PostScript Level 2 (Color)#      DISK#  sasprt.ps
  mod#  LaserJet 5#           PCL 5c (DeltaRow)#               DISK#  sasprt.pcl
  del#  Gray PostScript#      PostScript Level 2(Gray Scale)#  DISK#  sasprt.ps
  del#  test#                 PostScript Level 2 (Color)#      DISK#  sasprt.ps
  add#  ColorPS#              PostScript Level 2 (Color)#      DISK#  sasprt.ps
;    
  proc prtdef data=printers list;
  run;
```

**Note:** If the end user modifies and saves new attributes for an administrator-defined printer in the Sashelp library, the printer becomes a user-defined printer in the Sasuser library. Values that are specified by the user override the values that were
set by the administrator. If the user-defined printer definition is deleted, the administrator-defined printer reappears.

Exporting and Backing Up Printer Definitions

The PRTEXP procedure enables you to back up your printer definitions as a SAS data set that can be restored with the PRTDEF procedure.

The PRTEXP procedure has the following syntax.

```
PROC PRTEXP <USESASHELP> <OUT=dataset>
   <SELECT | EXCLUDE> printer_1 printer_2 ... printer_n;
```

The following example shows how to back up four printer definitions (named PDF, postscript, PCL5, and PCL5c) using the PRTEXP procedure:

```
proc prtexp out=printers;
   select PDF postscript PCL5 PCL5c;
run;
```

For more information, see “PRTEXP Procedure” in Base SAS Procedures Guide.

Sample Values for the Device Type, Destination, and Host Options Fields

The following list provides examples of the printer values for device type, destination, and host options. Because these values can be dependent on each other, and the values can vary by operating environment, several examples are shown. You might want to refer to this list when you are installing a printer or when you change the destination of your output.

- **Device Type: Printer**
  - **z/OS**
    - Device type: Printer
    - Destination: (leave blank)
    - Host options: `sysout=class-value dest=printer-name`
  - **UNIX and Windows**
    - Device type: Printer
    - Destination: `printer name`
    - Host options: (leave blank)

- **Device Type: Pipe**

  Note: A sample command to send output to an lp-defined printer queue on a UNIX host is `lp -ddest`

- **UNIX**
  - Device Type: Pipe
  - Destination: `command`
  - Host options: (leave blank)
Creating PDF Files Using Universal Printing

PDF Files in SAS

PDF files can be read by the Adobe Acrobat Reader and other applications. In SAS, you create PDF files using the Output Delivery System (ODS). ODS uses the PDF Universal Printing printer to create a PDF. ODS provides styles and templates that you can apply to a document, or you can create your own styles and templates to customize a document. For more information, see “ODS PDF Statement” on page 119.
For a description of the PDF printer, you can either view the printer in the SAS registry or submit the following QDEVICE procedure and view the output in the SAS log:

```sas
proc qdevice;
  printer pdf;
run;
```

**Note:** If you have SAS/GRAPH installed, your PDF output can contain links and pop-up text boxes. For more information, see “Enhancing Web Presentations with Chart Descriptions, Data Tips, and Drill-Down Functionality” in SAS/GRAPH: Reference.

---

## Creating a PDF File

You can create a PDF file using the ODS PDF or ODS PRINTER statements. You specify the PDF Universal Printer either as the value of the PRINTERPATH= system option or as the value of the PRINTER= option in the ODS PRINTER statement. The ODS PDF statement creates output using the PDF Universal Printer. Therefore, you do not need to explicitly specify the PDF Universal Printer when you use the ODS PDF statement.

Here is some sample code to create a PDF file. In the first sample, the PDF Universal Printer does not need to be specified because the ODS PDF statement uses the PDF Universal Printer to create a PDF. In the second sample, the PDF Universal Printer is specified as the value of the PRINTERPATH= system option and the ODS PRINTER statement creates the PDF:

```sas
ods html close;
ods pdf;
...
more SAS code...
ods pdf close;
ods html;
ods html close;
ods printer;
...
more SAS code...
ods printer close;
ods html;
```

## Example of Creating a PDF Using the ODS PDF Statement

This example creates a PDF file that contains the first five observations of the data set Sashelp.Class:

```sas
options obs=5 nodate pageno=1;
ods html close;
```
ods pdf;

proc print data=sashelp.class;
run;

ods pdf close;
ods html;

Here is the PDF output:

Figure 1.3  Sashelp.Class in a PDF File

---

System Options That Affect PDF Output

Before you create PDF output, you can use SAS system options to set document security restrictions. The document security restrictions specify what can be done to the document, as well as the security method, the printing resolution, and the encryption level.

The following table lists the system options that can be used to set the PDF document security restrictions:
<table>
<thead>
<tr>
<th>System Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDFACCESS on page 60</td>
<td>Specifies whether the PDF document can be edited.</td>
</tr>
<tr>
<td>PDFASSEMBLY on page 62</td>
<td>Specifies whether PDF documents can be assembled.</td>
</tr>
<tr>
<td>PDFCOMMENT on page 63</td>
<td>Specifies whether PDF document comments can be modified.</td>
</tr>
<tr>
<td>PDFCONTENT on page 64</td>
<td>Specifies whether the contents of a PDF document can be changed.</td>
</tr>
<tr>
<td>PDFCOPY on page 65</td>
<td>Specifies whether text and graphics from a PDF document can be copied.</td>
</tr>
<tr>
<td>PDFFILLIN on page 67</td>
<td>Specifies whether PDF forms can be filled in.</td>
</tr>
<tr>
<td>PDFPAGELAYOUT on page 68</td>
<td>Specifies the page layout for PDF documents.</td>
</tr>
<tr>
<td>PDFPAGEVIEW on page 69</td>
<td>Specifies the page viewing mode for PDF documents.</td>
</tr>
<tr>
<td>PDFPASSWORD on page 70</td>
<td>Specifies the password to use to open a PDF document and the password used by a PDF document owner.</td>
</tr>
<tr>
<td>PDFPRINT on page 72</td>
<td>Specifies the resolution to print PDF documents.</td>
</tr>
<tr>
<td>PDFSECURITY on page 74</td>
<td>Specifies the level of encryption for PDF documents.</td>
</tr>
</tbody>
</table>
PART 2

Printing and Routing Output in LINUX Environments

Chapter 2
Printing and Routing Output
Overview of Printing Output in LINUX Environments

When you print text or graphics, SAS needs to know where the output should go, how it should be written, and how the output should look. Universal Printing is the default printing mechanism in LINUX. Universal Printing enables you to create HTML files or PDF and RTF documents. For more information, see “Overview of Printing Output in LINUX Environments” on page 29.

If you are printing graphics, the output is controlled by native SAS/GRAPH drivers. See the online Help for SAS/GRAPH for information about native SAS/GRAPH drivers.

Previewing Output in LINUX Environments

Previewing Output Using Universal Printing

With Universal Printing, you can preview your output before you send it to a printer, plotter, or external file. To preview your output, you first need to define a previewer for your system. For more information, see “Universal Printing” in SAS Language Reference: Concepts.
PART 3

Using Fonts with Universal Printers

Chapter 3
Usage Details
Universal printing uses the following two methods to generate and display fonts in SAS output.

- the FreeType library
- the font-rendering capabilities of the host

Universal printing supports the following font formats:

- TrueType fonts
- Type1 fonts

Note: Universal Printing does not support double-byte Type1 fonts.

Noto Sans TrueType fonts are included to support languages for harmonious web display.

The output methods in the following table are recommended because they use the FreeType library to render fonts. This means that they can render fonts in all of the operating environments that SAS supports. ¹

1. The FreeType library is used to perform two distinct operations in SAS: measuring the text and rendering the font. Depending on the output devices specified, the FreeType library can perform one or both of these operations to render fonts.
Table 3.1 Devices That Use the FreeType Library to Render Fonts

<table>
<thead>
<tr>
<th>Output Method</th>
<th>Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODS printing and Universal Printing</td>
<td>PDF, PDFA</td>
</tr>
<tr>
<td>ODS RTF</td>
<td>PNG, SASEMF ¹</td>
</tr>
<tr>
<td></td>
<td>EMF</td>
</tr>
<tr>
<td>ODS HTML</td>
<td>PNG, PNGT, PNG300, GIF, JPEG, SVG, SVGT¹</td>
</tr>
</tbody>
</table>

¹ If the NOFONTRENDERING option is set, the device driver uses only the FreeType library for measuring the text.

Operating Environment Information: With devices that use host rendering in a Linux operating environment, the TrueType fonts must be installed on the X server that is being used. This is usually specified by the DISPLAY environment variable. For more information, see the Configuration Guide for SAS 9.4 Foundation for UNIX Environments.

Run the OPTIONS procedure with the FONTSLOC option specified to determine the location of font files at your site. You can also contact your system administrator to discover the font files location.

```sas
proc options option=fontsloc value; run;
```

TIP For a list of the fonts installed, use the QDEVICE procedure as in the following code: For more information, see “QDEVICE Procedure” in Base SAS Procedures Guide.

```sas
%macro fontlist(type, name);
proc qdevice report=font out=fonts;
   &type &name
   var font ftype fstyle fweight;
run;

data;
set fonts;
drop ftype;
length type $16;
if ftype = "System"
   then do;
      if substr(font,2,3) = "ttf" then type = "TrueType";
      else if substr(font,2,3) = "at1" then type = "Adobe Type1";
      else if substr(font,2,3) = "cff" then type = "Adobe CFF/Type2";
      else if substr(font,2,3) = "pfr" then type = "Bitstream PFR";
      else type = "System";
      if type ^= "System" then font = substr(font,7,length(font)-6);
      else if substr(font,1,1) = "@" then font = substr(font, 2,length(font)-1);
   end;
   else type = "Printer Resident";
run;
proc sort;
```
by font;
run;

title "Fonts Supported by the %upcase(&name) &type";

proc print label;
    label fstyle="Style" fweight="Weight" font="Font" type="Type";
run;

%mend fontlist;

%fontlist(printer, pdf)
%fontlist(device, pdf)
%fontlist(printer, png)
%fontlist(device, pcl5c)

Here is the output for the first 25 fonts in the output data set:

<table>
<thead>
<tr>
<th>Obs</th>
<th>Font</th>
<th>Style</th>
<th>Weigth</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adobe Caslon</td>
<td>italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>2</td>
<td>Adobe Caslon</td>
<td>italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>3</td>
<td>Adobe Caslon</td>
<td>italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>4</td>
<td>Adobe Caslon</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>5</td>
<td>Adobe Caslon</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>6</td>
<td>Adobe Caslon</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>7</td>
<td>Adobe Caslon Oldstyle</td>
<td>italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>8</td>
<td>Adobe Caslon Oldstyle</td>
<td>italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>9</td>
<td>Adobe Caslon Oldstyle</td>
<td>italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>10</td>
<td>Adobe Caslon Oldstyle</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>11</td>
<td>Adobe Caslon Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>12</td>
<td>Adobe Caslon Oldstyle</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>13</td>
<td>Adobe Caslon Small Caps</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>14</td>
<td>Adobe Caslon Small Caps Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>15</td>
<td>Adobe Garamonial</td>
<td>italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>16</td>
<td>Adobe Garamonial</td>
<td>italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>17</td>
<td>Adobe Garamonial</td>
<td>italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>18</td>
<td>Adobe Garamonial</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>19</td>
<td>Adobe Garamonial</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>20</td>
<td>Adobe Garamonial</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>21</td>
<td>Adobe Garamonial Oldstyle</td>
<td>italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>22</td>
<td>Adobe Garamonial Oldstyle</td>
<td>italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>23</td>
<td>Adobe Garamonial Oldstyle</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>24</td>
<td>Adobe Garamonial Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>25</td>
<td>Adobe Garamonial Small Caps Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
</tbody>
</table>
The FONTEMBEDDING System Option

Use a system option to set up font embedding. It allows the fonts used in the creation of output to accompany that output, ensuring that it is displayed or printed exactly as you intended. See the "FONTEMBEDDING System Option" on page 53 for more information. Here are some important points to know about font embedding:

- Fonts are included in the output files that are created by the Universal Printer, and, if installed, SAS/GRAPH.
- Output files with embedded fonts do not rely on fonts being installed on the computer that is used to view or print the output file.
- When NOFONTEMBEDDING is set, the output files rely on the fonts being installed on the computer that is used to view or print the font.
- File size is increased for vector output for printers such as PDF.
- Not all printers support font embedding. To determine whether the printer that you are using supports font embedding, use the QDEVICE procedure. If Font Embedding is listed in the SAS log with a value of Option or Always, then the printer supports font embedding.

```sas
proc qdevice report=general;
  printer pdf;
run;
```

- Not all browsers support font embedding.

ODS Styles and TrueType Fonts

By default, many SAS/GRAPH device drivers and all Universal Printers generate output by using ODS styles, and these ODS styles use TrueType fonts. If no style is specified, the default style is used.

**Note:** A licensed installation of SAS/GRAPH is optional.

Portability of TrueType Fonts

TrueType fonts are portable across operating environments and are always available in Microsoft Windows environments. A few TrueType fonts are included with some versions of Linux X Windows.
International Character Support

TrueType fonts support a wide range of international characters.

TrueType Fonts Supplied by SAS

When you install SAS, a number of TrueType fonts are available. TrueType fonts that are supplied by SAS can be categorized into four groups: Windows Glyph List (WGL) Pan-European character set fonts; graphic symbol; multilingual; and monolingual Asian. The following tables show the fonts supplied by SAS.

The fonts that are supplied by SAS

Table 3.2  Multilingual TrueType Fonts

<table>
<thead>
<tr>
<th>Font Name</th>
<th>Language Supported</th>
<th>Font Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arial Unicode MS¹</td>
<td>Arabic, Armenian, Basic Latin, Bengali, Bopomofo, Cyrillic, Devanagari, Georgian, Greek and Coptic, Gujarati, Gurmukhi, hangul jamo, Hebrew, hiragana, Kanbun, Kannada, katakana, Lao, Malayalam, Oriya, Tamil, Telugu, Oriya, Tamil, Telugu, Thai Tibetan.</td>
<td>sans-serif</td>
</tr>
<tr>
<td>Times New Roman Uni¹</td>
<td>Arabic, Basic Latin, Bopomofo, Cyrillic,Devanagari, Georgian, Greek and Coptic,Gujarati, hangul jamo, Hebrew, hiragana, Kanbun, katakana, Lao, Mongolian, Tamil, Telugu, Thai, Tibetan.</td>
<td>serif</td>
</tr>
</tbody>
</table>

¹ The Arial Unicode MS and Times New Roman fonts replace the Monotype Sans WT and Thorndale Duospace WT fonts, respectively.
Table 3.3  Monolingual Asian TrueType Fonts

<table>
<thead>
<tr>
<th>Language Supported</th>
<th>Font Name</th>
<th>Character Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korean</td>
<td>Gulim, Dotum</td>
<td>KSC5601</td>
</tr>
<tr>
<td></td>
<td>Batang, Gungsuh</td>
<td>KSC5601</td>
</tr>
<tr>
<td>Japanese</td>
<td>MS Gothic, MS UI Gothic, MS PGothic</td>
<td>Shift JIS</td>
</tr>
<tr>
<td></td>
<td>MS Mincho, MS PMincho</td>
<td>Shift JIS</td>
</tr>
<tr>
<td>Simplified Chinese</td>
<td>CSongGB18030C-Light</td>
<td>GB18030 and GB2312</td>
</tr>
<tr>
<td></td>
<td>CSongGB18030-LightHWL</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MYingHei_18030_C-Medium</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MYingHei_18030_C-MediumHWL</td>
<td></td>
</tr>
<tr>
<td>Traditional Chinese</td>
<td>Hei</td>
<td>Big5</td>
</tr>
<tr>
<td></td>
<td>MingLiU, PMingLiU</td>
<td>Big5</td>
</tr>
</tbody>
</table>

1 Hei, MingLiU, and PMingLiu support HKSCS2004 (Hong Kong Supplemental Character Set) characters.

Starting with the second release for SAS Viya, the fonts in the following table replace the Avenir Next and Helvetica LT Pro fonts.

Table 3.4  AvenirNextforSAS and HelveticaNeueforSAS TrueType Fonts Distributed by SAS

<table>
<thead>
<tr>
<th>Font Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AvenirNextforSAS</td>
</tr>
<tr>
<td>AvenirNextforSAS Bold Italic</td>
</tr>
<tr>
<td>AvenirNextforSAS Bold</td>
</tr>
<tr>
<td>AvenirNextforSAS Italic</td>
</tr>
<tr>
<td>AvenirNextforSAS Light</td>
</tr>
<tr>
<td>AvenirNextforSAS Light Italic</td>
</tr>
<tr>
<td>HelveticaNeueforSAS</td>
</tr>
<tr>
<td>HelveticaNeueforSAS Bold Italic</td>
</tr>
<tr>
<td>HelveticaNeueforSAS Bold</td>
</tr>
</tbody>
</table>
AvenirNextforSAS is a sans-serif TrueType font family with additional characters characterized as a modernist typeface designed for on-screen display. Its ancestors are primarily the Futura and Univers typefaces.

- Helvetica LT Pro Regular
- Helvetica LT Pro Bold
- Helvetica LT Pro Italic
- Helvetica LT Pro Bold Italic
- Helvetica LT Pro Light
- Helvetica LT Pro Light Italic
- Last Resort

Registering Fonts

In addition to the TrueType fonts that come installed with SAS, SAS supports PostScript Type1 fonts. The following table shows the font prefix and file extension for TrueType and Type1 fonts:

<table>
<thead>
<tr>
<th>Type</th>
<th>Tag</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>TrueType</td>
<td>&lt;ttf&gt;</td>
<td>.ttf</td>
</tr>
<tr>
<td>Type1</td>
<td>&lt;at1&gt;</td>
<td>.pfb</td>
</tr>
</tbody>
</table>

1 Data from a .pfm file is used to generate output using the SAS/GRAPH SASEMF and SASWMF devices on Windows. On UNIX, data from a .pfm file is used to generate output using the WMF device and the EMF universal printer. This file is not required to register Type1 fonts using PROC FONTREG. If you do not register a .pfm file, you might not have the desired results.

Note: The fonts that are supplied by SAS and the fonts that are installed by Microsoft are automatically registered in the SAS registry when you install SAS. Fonts that are installed after you install SAS must be registered manually in the SAS registry.

To register fonts for the UNIX or Windows file system, submit the following SAS program. The FONTREG procedure enables you to update the SAS registry to include system fonts, which can then be used in SAS output. PROC FONTREG
uses FreeType font-rendering to recognize and incorporate various types of font definitions. Fonts of any type that can be incorporated and used by SAS are known collectively in this documentation as fonts in the FreeType library. The FONTPATH statement specifies the directory that contains the fonts and `pathname` is the directory path of the fonts.

```
proc fontreg;
    fontpath 'pathname';
run;
proc fontreg;
    fontfile 'filename';
run;
```

**Note:** Including a system font in the SAS registry means that SAS knows where to find the font file. The font file is not actually used until the font is called for in a SAS program. Therefore, do not move or delete font files after you have included the fonts in the SAS registry.

---

**Listing the Registered Fonts for a Device**

You can use the QDEVICE procedure to view the list of fonts that have been registered in the SAS registry, including fonts that you registered with the FONTREG procedure. You can submit the following program to view fonts for a device or universal printer.

```
/* Macro FONTLIST - Report fonts supported by a device */
%macro fontlist(type, name);
proc qdevice report=font out=fonts;
    &type &name
    var font ftype fstyle fweight;
run;

data;
set fonts;
drop ftype;
length type $16;
if ftype = "System" then type = "TrueType";
    then do;
        if substr(font,2,3) = "ttf" then type = "TrueType";
            else if substr(font,2,3) = "at1" then type = "Adobe Type1";
                else if substr(font,2,3) = "cff" then type = "Adobe CFF/Type2";
                    else if substr(font,2,3) = "pfr" then type = "Bitstream PFR";
                        else type = "System";
                        if type ^= "System" then font = substr(font,7,length(font)-6);
                        else if substr(font,1,1) = @" then font = substr(font, 2,length(font)-1);
                    end;
            else type = "Printer Resident";
        end;
run;
proc sort;
    by font;
```

40  Chapter 3 / Usage Details
Here is the output for the first 25 fonts in the output data set:

<table>
<thead>
<tr>
<th>Obs</th>
<th>Font</th>
<th>Style</th>
<th>Weight</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adobe Casion</td>
<td>Italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>2</td>
<td>Adobe Casion</td>
<td>Italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>3</td>
<td>Adobe Casion</td>
<td>Italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>4</td>
<td>Adobe Casion</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>5</td>
<td>Adobe Casion</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>6</td>
<td>Adobe Casion Oldstyle</td>
<td>Italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>7</td>
<td>Adobe Casion Oldstyle</td>
<td>Italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>8</td>
<td>Adobe Casion Oldstyle</td>
<td>Italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>9</td>
<td>Adobe Casion Oldstyle</td>
<td>Italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>10</td>
<td>Adobe Casion Oldstyle</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>11</td>
<td>Adobe Casion Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>12</td>
<td>Adobe Casion Oldstyle</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>13</td>
<td>Adobe Casion Small Caps</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>14</td>
<td>Adobe Casion Small Caps Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>15</td>
<td>Adobe Geramond</td>
<td>Italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>16</td>
<td>Adobe Geramond</td>
<td>Italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>17</td>
<td>Adobe Geramond</td>
<td>Italic</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>18</td>
<td>Adobe Geramond</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>19</td>
<td>Adobe Geramond</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>20</td>
<td>Adobe Geramond</td>
<td>Roman</td>
<td>Semi Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>21</td>
<td>Adobe Geramond Oldstyle</td>
<td>Italic</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>22</td>
<td>Adobe Geramond Oldstyle</td>
<td>Italic</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>23</td>
<td>Adobe Geramond Oldstyle</td>
<td>Roman</td>
<td>Bold</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>24</td>
<td>Adobe Geramond Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
<tr>
<td>25</td>
<td>Adobe Geramond Small Caps Oldstyle</td>
<td>Roman</td>
<td>Normal</td>
<td>Printer Resident</td>
</tr>
</tbody>
</table>

For more information, see “QDEVICE Procedure” in Base SAS Procedures Guide.
Using Fonts

Specifying Fonts with SAS Program Statements

You can specify a font in the TITLE statement. For example, if you want to use the TrueType font Albany AMT in a TITLE statement, include the following line of code in your SAS program.

```sas
Title1 f="Albany AMT" "Text in Albany AMT";
```

You can also specify attributes such as style or weight in the TITLE statement by using the forward slash (/) as a delimiter.

```sas
Title1 f="Albany AMT/Italic/Bold" "Text in Bold Italic Albany AMT";
```

Or, starting with the second release for SAS Viya, if you want to use the AvenirNextforSAS Light Italic TrueType font in a TITLE statement, include the following line of code in your SAS program.

```sas
Title1 f="AvenirNextforSAS Light/Italic" "AvenirNextforSAS Light Italic";
```

For ODS templates, the attributes are specified after the text size parameter.

---

Note: You should use the `<ttf>` tag only when it is necessary (for example, to distinguish between a TrueType font and another type of font with the same name).

---

Specifying a Font with the SYSPRINTFONT Option

The SYSPRINTFONT= system option sets the default font that you want to use for printing from windows such as the Program Editor, the Log, and Output windows. For example, you could use the SYSPRINTFONT= system option to print your output in the Albany AMT font by submitting the following OPTIONS statement.

```sas
options sysprintfont=("Albany AMT");
```

You can also use the SYSPRINTFONT= system option to specify the weight and size of a font. For example, the following code specifies an Arial font that uses bold face, is italicized, and has a size of 14 points.

```sas
options sysprintfont=("Arial" bold italic 14);
```

You can override the default font by explicit font specifications or ODS styles.

For more information, see the "SYSPRINTFONT= System Option" in SAS System Options: Reference.
About SAS System Options

System options are instructions that affect the processing of an entire SAS program or SAS session from the time the option is specified until it is changed. For example, there are SAS system options that control the appearance of SAS output or how observations are handled in SAS data sets. Some system options affect only a particular SAS component or product. The documentation for that component or product provides the details for those system options. This document provides information about the system options that affect printed output. For details of all other system options and how to use them, see “Definition of System Options” in SAS System Options: Reference.

There is a system option that embeds fonts in your output for intentional control of displaying or printing that output. See “The FONTEMBEDDING System Option” on page 36 for details.

SAS provides a procedure, a statement, and a function that help discover or control the value of a SAS system option.

OPTIONS procedure
PROC OPTIONS processes a SAS system option. For details about the SAS procedure that discovers SAS system option settings, see “OPTIONS Procedure” in SAS System Options: Reference.

PROC OPTIONS statement
The SAS OPTIONS statement specifies or changes the value of one or more SAS system options. This global change remains in effect for the rest of the job, session, SAS process, or until another SAS OPTIONS statement is issued. For details, see “OPTIONS Statement” in SAS Global Statements: Reference.

SAS GETOPTION function
Retrieves the value of a SAS system option. For more information, see “GETOPTION Function” in SAS System Options: Reference.
See Also

For links to the component and product documents that describe system options affecting them, see “SAS System Options Documented in Other SAS Publications” in SAS System Options: Reference.
Dictionary of Printing-Related System Options

Dictionary

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Dictionary

BOTTOMMARGIN= System Option

Specifies the size of the margin at the bottom of a printed page.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)
Syntax

BOTTOMMARGIN=margin-size<margin-unit>

Syntax Description

**margin-size**
- specifies the size of the margin.

**Restriction**
- The bottom margin should be small enough so that the top margin plus the bottom margin is less than the height of the paper.

**Interaction**
- Changing the value of this option might result in changes to the value of the PAGESIZE= system option.

**<margin-unit>**
- specifies the units for margin-size. The margin-unit can be *in* for inches or *cm* for centimeters. *<margin-unit>* is saved as part of the value of the BOTTOMMARGIN system option.

**Default**
- *inches*

Details

All margins have a minimum that is dependent on the printer and the paper size.

Example

```sas
options bottommargin=10cm;
```

See Also

- “Printing with SAS” in *SAS Language Reference: Concepts*
- “Understanding ODS Destinations” in *SAS Output Delivery System: User’s Guide*

System Options:

- “LEFTMARGIN= System Option” on page 55
- “RIGHTMARGIN= System Option” on page 77
- “TOPMARGIN= System Option” on page 78
COLOPHON= System Option

Specifies a text string that is embedded in a graphic file or a PDF that is created by Universal Printers. The text string is not displayed in the rendered graphic or PDF.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP= ODSPRINT

Note: This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

COLOPHON="text-string"

Syntax Description

text-string
     specifies the text that is embedded in a graphic file.

<table>
<thead>
<tr>
<th>Length</th>
<th>up to 4,000 characters.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirement</td>
<td>The text string must be enclosed in quotation marks.</td>
</tr>
<tr>
<td>Interaction</td>
<td>Text strings that are longer than the value of the LRECL= option are truncated. The default value of the LRECL= option is 32767. Temporarily increase the value of the LRECL= option for longer text strings.</td>
</tr>
</tbody>
</table>

Details

A colophon is a printer’s mark. You can use the COLOPHON= option to add a signature, an identification, or a comment to Universal Printer output files. The text string is not visible in the graphic or PDF when the output file is displayed or printed. You can view the colophon text string by using a text editor or a third-party application.

Example

This example adds the text "Simple Text String" to the output file that is created by the various Universal Printers:

ods html close;
ods listing close;
%macro ctext(printer,file,ext);
%filename(sasprt, &file, &ext);
options printerpath="(&printer) sasprt"
    colophon="Simple Text String";
ods printer;
title "(&printer);
proc print data=sashelp.class;
run;
ods printer close;
%mend;

%ctext(PCL5c, coloph1,pcl);
%ctext(GIF, coloph1,gif);
%ctext(Postscript, coloph1,psl);
%ctext(PDF, coloph1,pdf);
%ctext(PNG, coloph1,png);
%ctext(SVG, coloph1,svg);
%ctext(EMF, coloph1,emf);
%ctext(TIFF, coloph1.tif);
ods listing;

Using Notepad, you can see the text string “Simple Text String” in the SVG output file.

The text string is not visible in the output file:
COLORPRINTING System Option

Specifies whether to print in color if color printing is supported.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP=ODSPRINT

Default: The shipped default is COLORPRINTING.

Note: This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

COLORPRINTING | NOCOLORPRINTING

Syntax Description

COLORPRINTING
specifies to attempt to print in color.

NOCOLORPRINTING
specifies not to print in color.

Details

Most SAS system options are initialized with default settings when SAS is invoked. However, the default settings and option values for some SAS system options might vary...
vary both by operating environment and by site. For details, see the SAS documentation for your operating environment.

See Also
- Printing with SAS

Statements:

DEFLATION= System Option

Specifies the level of compression for device drivers that support the Deflate compression algorithm.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Not supported

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP=ODSPRINT

Alias: DEFLATE

Default: The shipped default is 6.

Requirement: The UPRINTCOMPRESS system option must be set in order to compress files.

Note: This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

DEFLATION=n | MIN | MAX

Syntax Description

\( n \)

specifies the level of compression. The larger the number, the greater the compression. For example, \( n=0 \) is the minimum compression level (completely uncompressed), and \( n=9 \) is the maximum compression level.

Range 0–9

MIN

specifies the minimum compression level of 0.

MAX

specifies the maximum compression level of 9.
Details

The DEFLATION= system option controls the level of compression for device drivers that support Deflate, such as PDF and SVG.

The ODS PRINTER statement option, COMPRESS=, takes precedence over the DEFLATION system option.

See Also

Statements:

System Options:
- “PRINTERPATH= System Option” on page 76
- “UPRINTCOMPRESSION System Option” on page 79

FONTEMBEDDING System Option

Specifies whether font embedding is enabled in Universal Printer and SAS/GRAFH printing.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP=

Default: The shipped default is FONTEMBEDDING.

Note: This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

FONTEMBEDDING | NOFONTEMBEDDING

Syntax Description

FONTEMBEDDING
specifies to enable font embedding.

NOFONTEMBEDDING
specifies to disable font embedding.
Details

Font embedding is used mainly by Universal Printing. Not all printers support font embedding. To determine whether the printer that you are using supports font embedding, use the QDEVICE procedure. If **Font Embedding** is listed in the SAS log with a value of **Option** or **Always**, the printer supports font embedding. Here is a partial log output from the QDEVICE procedure:

```sas
369  proc qdevice report=general;
370     printer pdf;
371  run;
```

Name: PDF  
Description: Portable Document Format Version 1.4  
Module: SASPDPDF  
Type: Universal Printer  
Registry: SASHELP  
Prototype: PDF Version 1.4  
Default Typeface: Cumberland AMT  
Typeface Alias: Courier  
  Font Style: Regular  
  Font Weight: Normal  
  Font Height: 8 points  
  Font Version: Version 1.03  
Maximum Colors: 16777216  
Visual Color: Direct Color  
Color Support: RGBA  
Destination: sasprt.pdf  
I/O Type: DISK  
Data Format: PDF  

...more registry settings...

Compression Method: FLATE  
**Font Embedding**: Option  
Animation: Unsupported

When **FONTEMBEDDING** is set, fonts can be embedded, or included, in the output files that are created by the Universal Printer and SAS/GRAPH. Output files with embedded fonts do not rely on fonts being installed on the computer that is used to view or print the output file. File size is increased for vector output for printers such as PDF and PostScript.

When **NOFONTEMBEDDING** is set, the output files rely on the fonts being installed on the computer that is used to view or print the font. If a font is not found on the computer, the printer or the application that displays the output might perform font substitution. Image output is not affected when **NOFONTEMBEDDING** is set.

To determine which fonts are substituted for a given printer, use the Print Setup window or the QDEVICE procedure to display the Printer Setup properties. Under **Fonts**, any individual fonts that are listed are recognized by the printer. All other fonts, including those that are available via a link in the SAS Registry, are substituted in the document when the document is created.

See Also

- **SAS/GRAPH: Reference**
- “Universal Printing” in **SAS Language Reference: Concepts**
LEFTMARGIN= System Option

Specifies the print margin for the left side of the page.

**Valid in:**
SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

**Category:**
Log and Procedure Output Control: ODS Printing

**Default:**
The shipped default is 0.000 in.

**Note:**
This option cannot be restricted by a site administrator. For more information, see “Restricted Options” in *SAS System Options: Reference*.

**Syntax**

```
LEFTMARGIN=margin-size<margin-unit>
```

**Syntax Description**

`margin-size`

specifies the size of the left print margin.

**Restriction**
The left margin should be small enough so that the left margin plus the right margin is less than the width of the paper.

**Interaction**
Changing the value of this option might result in changes to the value of the LINESIZE= system option.

`<margin-unit>`

specifies the units for margin-size. The margin-unit can be *in* for inches or *cm* for centimeters. `<margin-unit>` is saved as part of the value of the LEFTMARGIN system option whether it is specified.

**Default**
`inches`

**Details**

All margins have a minimum that is dependent on the printer and the paper size.

**See Also**

- “Printing with SAS” in *SAS Language Reference: Concepts*
- “Understanding ODS Destinations” in *SAS Output Delivery System: User’s Guide*
ORIENTATION= System Option

Specifies the paper orientation to use when printing to a printer.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP=

Default: The shipped default is PORTRAIT.

Requirement: The ORIENTATION= option is valid only for paper sizes that are defined in the SAS Registry. The option is ignored for custom paper sizes.

Note: This option cannot be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Tip: If the orientation of a PDF document is changed after the PDF destination is opened and before the PDF destination is closed, any setting for margins is taken from the OPTIONS statement in place before the ODS PDF FILE= statement. If no OPTIONS statement is used to explicitly set the margins, the margin settings are retrieved from the SAS registry.

Syntax

ORIENTATION=PORTRAIT | LANDSCAPE | REVERSEPORTRAIT | REVERSELANDSCAPE

Syntax Description

PORTRAIT
specifies the paper orientation as portrait.

LANDSCAPE
specifies the paper orientation as landscape.

REVERSEPORTRAIT
specifies the paper orientation as reverse portrait. Use this value to control the top of the page relative to how the paper is inserted into the input paper tray. REVERSEPORTRAIT can be used when you print preprinted or punched forms.
REVERSELANDSCAPE
specifies the paper orientation as reverse landscape. Use this value to control the top of the page relative to how the paper is inserted into the input paper tray. REVERSELANDSCAPE can be used when you print preprinted or punched forms.

Details
Changing the value of this option might result in changes to the values of the portable LINESIZE= and PAGESIZE= system options.

You can change the orientation between document pages for the following output types:
- the LISTING destination
- the RTF destination
- a Universal Printing printer

Note: Changing the orientation between document pages is supported only for Universal Printing. It is not supported for Windows printing.

Use the OPTIONS statement between the steps that create output to change the page orientation.

Example
This example creates a PDF file with both portrait and landscape orientations.

```sas
options orientation=landscape obs=5;
ods pdf file="File3.pdf";
proc print data=sashelp.class;
run;
options orientation=portrait;
proc print data=sashelp.retail; run;
ods pdf close;
```

Here is the output:

**Output 5.1** The First Page of the PDF Has a Landscape Orientation
See Also

- “Universal Printing” in SAS Language Reference: Concepts

Statements:


System Options:

- “LINESIZE= System Option” in SAS System Options: Reference
- “PAGESIZE= System Option” in SAS System Options: Reference

**PAPERSIZE= System Option**

Specifies the paper size to use for printing.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Categories: Environment Control: Language Control
Log and Procedure Output Control: ODS Printing

PROC
OPTIONS
GROUP= LANGUAGECONTROL
ODSPRINT
Default: The default is LETTER or A4, depending on the locale.

Note: This option cannot be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

```
PAPERSIZE=LOCALE | paper_size_name
| (width_value,<,>,height_value)
| ('width_value',<,>,height_value')
| ("width_value",<,>,"height_value")
```

Syntax Description

**LOCALE**
specifies to use the value of the LOCALE= system option to determine the value of the PAPERSIZE= option. Depending on the locale, the PAPERSIZE= option is set to either LETTER or A4.


**paper_size_name**
specifies a predefined paper size.

Default LETTER or A4, depending on the locale

Restriction The maximum length is 200 characters.

Requirements When the name of a predefined paper size contains spaces, enclose the name in single or double quotation marks.

A space is required between the width and the height values if you do not use either single or double quotation marks for values.

Tip For more information, use the Registry Editor, or use PROC REGISTRY to obtain a list of supported paper sizes. Additional values can be added.

```
("width-value", "height-value")
```
specifies paper width and height as positive floating-point values.

Default inches

Range \textit{in} or \textit{cm} for width \textit{value}, height \textit{value}

Requirement If you specify \textit{width-value} and \textit{height-value} with spaces between the number and the unit, the values must be enclosed in quotation marks (for example, "5 in" "7 in").

Interaction When you specify a custom paper size, the ORIENTATION= system option is ignored and the orientation is determined by the width and height values. The orientation is portrait if the paper height is more than the width. The orientation is landscape if the paper width is more than the height. Reverse orientations are not supported for custom paper sizes.
Details

If you specify a predefined paper size or a custom size that is not supported by your printer, the printer default paper size is used. The printer default paper size is locale dependent and can be changed using the Page Setup dialog box.

Fields that specify values for paper sizes can either be separated by blanks or commas.

Note: Changing the value of this option can result in changes to the values of the portable LINESIZE= and PAGESIZE= system options.

Comparisons

The first OPTIONS statement sets a paper size value that is a paper size name from the SAS Registry. The second OPTIONS statement sets a specific width and height for a paper size.

```plaintext
options papersize="480x640 Pixels";
papersize=4.5 7;
```

In the first example, quotation marks are required because there is a space in the name.

In the second example, quotation marks are not required. When no measurement units are specified, SAS writes the following warning to the SAS log:

```
WARNING: Units were not specified on the PAPERSIZE option. Inches will be used.
```

You can avoid the warning message by adding the unit type, in or cm, to the value with no space separating the value and the unit type:

```plaintext
options papersize=(4.5in 7in);
```

See Also

- “Universal Printing” in SAS Language Reference: Concepts

Statements:


System Options:

- “ORIENTATION= System Option” on page 56
- “PAPERDEST= System Option” in SAS System Options: Reference
- “PAPERSOURCE= System Option” in SAS System Options: Reference
- “PAPERTYPE= System Option” in SAS System Options: Reference

---

PDFACCESS System Option

Specifies whether PDF documents can be edited.
Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: PDF

PROC OPTIONS GROUP=

Default: The shipped default is PDFACCESS.

Requirement: Adobe Acrobat Reader or Professional 5.0 and later versions

Notes: Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

PDFACCESS | NOPDFACCESS

Syntax Description

PDFACCESS
specifies that PDF documents can be edited.

NOPDFACCESS
specifies that PDF documents cannot be edited.

Details

The PDFACCESS option can affect the Document Editing Enabled document property.

The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

The following table shows how the Document Editing Enabled document property is set when you specify the PDFACCESS option and set the PDFSECURITY= option to HIGH:

<table>
<thead>
<tr>
<th>PDFACCESS</th>
<th>NOPDFACCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDFSECURITY=HIGH</td>
<td>PDFSECURITY=HIGH</td>
</tr>
</tbody>
</table>

Document Editing Enabled Allowed Allowed

See Also

- “Securing ODS-Generated PDF Files” on page 136
PDFASSEMBLY System Option

Specifies whether PDF documents can be assembled.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: PDF

PROC OPTIONS GROUP=

Default: The shipped default is NOPDFASSEMBLY.

Requirement: Adobe Acrobat Reader or Professional 5.0 and later versions

Notes: Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

PDFASSEMBLY | NOPDFASSEMBLY

Syntax Description

PDFASSEMBLY
specifies that PDF documents can be assembled.

NOPDFASSEMBLY
specifies that PDF documents cannot be assembled.

Details

When a PDF document is assembled, pages can be rotated, inserted, and deleted, and bookmarks and thumbnail images can be added.

The PDFASSEMBLY option can affect the Document Assembly document property. The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

The following table shows how the Document Assembly document property is set when you specify the PDFASSEMBLY option and set the PDFSECURITY= option to HIGH:
PDFCOMMENT System Option

Specifies whether PDF document comments can be modified.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: PDF

PROC OPTIONS GROUP=

Default: The shipped default is NOPDFCOMMENT.

Requirement: Adobe Acrobat Reader or Professional 5.0 and later versions

Notes: Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

PDFCOMMENT | NOPDFCOMMENT

Syntax Description

PDFCOMMENT specifies that PDF document comments can be modified.

NOPDFCOMMENT specifies that PDF document comments cannot be modified.
Details

The PDFCOMMENT option can affect the Commenting document property.

The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

When PDFSECURITY=NONE, the PDFCOMMENT option is enabled and PDF document comments can be modified.

The following table shows how the Commenting document properties are set when you specify the PDFCOMMENT option and set the PDFSECURITY= option to HIGH:

<table>
<thead>
<tr>
<th>PDFCOMMENT</th>
<th>NOPDFCOMMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDFSECURITY=HIGH</td>
<td>PDFSECURITY=HIGH</td>
</tr>
<tr>
<td>Commenting</td>
<td>Allowed</td>
</tr>
</tbody>
</table>

See Also

- “Securing ODS-Generated PDF Files” on page 136

System Options:

- “PDFFILLIN System Option” on page 67
- “PDFSECURITY= System Option” on page 74

PDFCONTENT System Option

Specifies whether the contents of a PDF document can be changed.

Valid in:

SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category:

Log and Procedure Output Control: PDF

PROC OPTIONS GROUP= PDF

Default:

The shipped default is NOPDFCONTENT.

Requirement:

Adobe Acrobat Reader or Professional 3.0 and later versions

Notes:

Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.
This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

**PDFCONTENT | NOPDFCONTENT**

Syntax Description

**PDFCONTENT**

specifies that the contents of a PDF document can be changed.

**NOPDFCONTENT**

specifies that the contents of a PDF document cannot be changed.

Details

The PDFCONTENT option can affect the Changing the Document document property.

The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

The following table shows how the Changing the Document document property is set when you specify the PDFCONTENT option and set the PDFSECURITY= option to HIGH:

<table>
<thead>
<tr>
<th></th>
<th>PDFCONTENT PDFSECURITY=HIGH</th>
<th>NOPDFCONTENT PDFSECURITY=HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing the Document</td>
<td>Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

See Also

- “Securing ODS-Generated PDF Files” on page 136

System Options:

- “PDFSECURITY= System Option” on page 74

**PDFCOPY System Option**

Specifies whether text and graphics from a PDF document can be copied.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: PDF
PROC OPTIONS GROUP= PDF

Default: The shipped default is PDFCOPY.

Requirement: Adobe Acrobat Reader or Professional 3.0 and later versions

Notes: Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

PDFCOPY | NOPDFCOPY

Syntax Description

PDFCOPY
specifies that text and graphics from a PDF document can be copied.

NOPDFCOPY
specifies that text and graphics from a PDF document cannot be copied.

Details

The PDFCOPY option can affect the Content Copying document property.

The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

The following table shows how the Content Copying document property is set when you specify the PDFCOPY option and set the PDFSECURITY= option to HIGH:

<table>
<thead>
<tr>
<th></th>
<th>PDFCOPY PDFSECURITY=HIGH</th>
<th>NOPDFCOPY PDFSECURITY=HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Copying</td>
<td>Allowed</td>
<td>Not Allowed</td>
</tr>
</tbody>
</table>

See Also

- “Securing ODS-Generated PDF Files” on page 136

System Options:

- “PDFSECURITY= System Option” on page 74
**PDFFILLIN System Option**

Specifies whether PDF forms can be filled in.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: PDF

PROC OPTIONS GROUP= PDF

Default: The shipped default is PDFFILLIN.

Requirement: Adobe Acrobat Reader or Professional 5.0 and later versions

Notes: Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

This option can be restricted by a site administrator. For more information, see "Restricted Options" in SAS System Options: Reference.

Syntax

**PDFFILLIN | NOPDFFILLIN**

Syntax Description

```
PDFFILLIN
    specifies that PDF forms can be filled in.

NOPDFFILLIN
    specifies that PDF forms cannot be filled in.
```

Details

The PDFFILLIN option can affect the Form Field Fill-in or Signing document property.

The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

The Form Field Fill-in or Signing document property is set by the PDFFILLIN option only when PDFSECURITY=HIGH. When PDFSECURITY=HIGH, PDFCOMMENT and PDFFILLIN can be set independently.

The following table shows how the Form Field Fill-in or Signing document property is set when you specify the PDFFILLIN option and set the PDFSECURITY= option to HIGH:
See Also

- “Securing ODS-Generated PDF Files” on page 136

System Options:

- “PDFCOMMENT System Option” on page 63
- “PDFSECURITY= System Option” on page 74

### PDFPAGEFORMAT= System Option

Specifies the page layout for PDF documents.

**Valid in:**
- SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

**Category:**
- Log and Procedure Output Control: PDF

**PROC OPTIONS GROUP= PDF**

**Default:**
- The shipped default is DEFAULT.

**Requirement:**
- Adobe Acrobat Reader or Professional 5.0 and later versions

**Notes:**
Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

This option can be restricted by a site administrator. For more information, see “Restricted Options” in *SAS System Options: Reference*.

### Syntax

```
PDFPAGEFORMAT= DEFAULT | SINGLEPAGE | CONTINUOUS | FACING | CONTINUOUSFACING
```

**Syntax Description**

- **DEFAULT**
  - specifies to use the current page layout for Acrobat Reader.
**SINGLEPAGE**
specifies to display one page at a time in the viewing area.

**CONTINUOUS**
specifies to display all document pages in the viewing area in a single column.

**FACING**
specifies to display only two pages in the viewing area, with the even pages on the left and the odd pages on the right.

**CONTINUOUSFACING**
specifies to display all pages in the viewing area, two pages side by side. The even pages are displayed on the left, and the odd pages display on the right.

**See Also**
- “Securing ODS-Generated PDF Files” on page 136

**System Options:**
- “PDFPAGEVIEW= System Option” on page 69

---

**PDFPAGEVIEW= System Option**

Specifies the page viewing mode for PDF documents.

**Valid in:**
SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

**Category:**
Log and Procedure Output Control: PDF

**PROC OPTIONS GROUP= PDF**

**Default:**
The shipped default is DEFAULT.

**Requirement:**
Adobe Acrobat Reader or Professional 5.0 and later versions

**Note:**
This option can be restricted by a site administrator. For more information, see “Restricted Options” in *SAS System Options: Reference*.

**Syntax**

```
PDFPAGEVIEW= DEFAULT | ACTUAL | FITPAGE | FITWIDTH | FULLSCREEN
```

**Syntax Description**

**DEFAULT**
specifies to use the current page view setting for Acrobat Reader.
ACTUAL
specifies to set the page view setting to 100%.

FITPAGE
specifies to view a page using the full extent of the viewing window, maintaining the height and width aspect ratio.

FITWIDTH
specifies to view a page using the full width of the viewing window. The height of the document is not scaled to fit the page.

FULLSCREEN
specifies to view a page using the full screen. This option disables the table of contents, bookmarks, and all other document access aids, such as accessing a specific page.

See Also
- “Securing ODS-Generated PDF Files” on page 136

System Options:
- “PDFPAGEVIEW= System Option” on page 69

### PDFPASSWORD= System Option

Specifies the password to use to open a PDF document and the password used by a PDF document owner to set document permissions and restrictions.

**Valid in:**
- SAS 9.4: Configuration file, SAS invocation, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, SASV9_OPTIONS environment variable (Linux only)

**Categories:**
- Log and Procedure Output Control: PDF
- System Administration: Security

**PROC OPTIONS GROUP=:**
- PDF
- SECURITY

**Alias:**
- PDFPW

**Requirement:**
- Adobe Acrobat Reader or Professional 3.0 and later versions

**Notes:**
- This option cannot be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.
- The OPTIONS procedure displays passwords in the SAS log as 8 Xs, regardless of the actual password length.

**Syntax**

```plaintext
PDFPASSWORD=(OPEN=password | OPEN="password"
< OWNER=password | OWNER="password">)
```

```plaintext
PDFPASSWORD=(OWNER=password | OWNER="password"
<OPEN=password | OPEN="password">)
```
**Syntax Description**

**OPEN=“password”**
- specifies the password to open a PDF document. Enclosing the password in single or double quotation marks is optional.

  - **password** specifies a set of characters, up to 32 characters, that are used to validate that a user has permission to open a PDF document.

  - **Restriction** The OPEN password must be different from the OWNER password.

**OWNER=“password”**
- specifies the password for the PDF document owner. The OWNER= password is required to set the document permissions and restrictions. Enclosing the password in quotation marks is optional.

  - **password** specifies a set of characters, up to 32 characters, that are used to validate the owner of a PDF document.

  - **Restriction** The OWNER password must be different from the OPEN password.

**Details**

You can set the PDFPASSWORD= option at any time, but it is ignored until the PDFSECURITY= system option is set to HIGH. When the PDFSECURITY= option is set to NONE, passwords for a PDF document are not needed.

The following table explains how passwords are used to open PDF documents and to set the permissions and restrictions using the PDF system options:

<table>
<thead>
<tr>
<th>PDFPASSWORD= Option Setting</th>
<th>PDF Document Permissions and Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN=“password”</td>
<td>A password is required to open the PDF document. No matter what PDF options have been set, no permissions and restrictions have been set because the OWNER= “password” is not used.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>OWNER=“password”</td>
<td>Use only this option to set permissions and restrictions on the PDF document and to not require a password to open the document. The value of the PDF options that are set when you create the PDF are applied to the PDF document.</td>
</tr>
</tbody>
</table>
PDFPASSWORD= Option Setting | PDF Document Permissions and Restrictions
---|---
OPEN=\textit{password} OWNER=\textit{password} | Use both arguments to require a password to open the PDF document and to set permissions and restrictions on the PDF document. Either password can be used to open the document. The value of the PDF options that are set when you create the PDF are applied to the PDF document.

See Also

- “Securing ODS-Generated PDF Files” on page 136

System Options:

- “PDFPAGEVIEW= System Option” on page 69
- “PDFSECURITY= System Option” on page 74

PDFPRINT= System Option

Specifies the resolution to print PDF documents.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: PDF

PROC OPTIONS GROUP= PDF

Default: The shipped default is HRES for Acrobat Reader or Professional 5.0 and later versions.

Requirement: Adobe Acrobat Reader or Professional 3.0 and later versions, depending on PDFPRINT setting

Note: This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

\texttt{PDFPRINT=}HRES | LRES | NONE
Syntax Description

**HRES**
specifies to print PDF documents at the highest resolution available on the printer.

**Restriction**
PDFPRINT=HRES can be set only when the PDFSECURITY option is set to HIGH.

**Requirement**
Acrobat Reader or Professional 5.0 and later versions.

**LRES**
specifies to print PDF documents at a lower resolution for draft-quality documents.

**Restriction**
PDFPRINT=LRES can be set only when the PDFSECURITY option is set to HIGH.

**Requirement**
Acrobat Reader or Professional 5.0 and later versions.

**NONE**
specifies the PDF documents have no print resolution.

**Restriction**
PDFPRINT=NONE can be set only when the PDFSECURITY option is set to HIGH.

**Requirement**
Any version of Acrobat Reader or Professional.

Details

The document property values for PDF security are not changed when you set PDFSECURITY=NULL. The results are the same as not specifying the option at all.

When PDFSECURITY= is set to HIGH, the value of the Printing document property is determined by the value of the PDFPRINT= option:

<table>
<thead>
<tr>
<th>PDFPRINT=HRES</th>
<th>PDFPRINT=LRES</th>
<th>PDFPRINT=NONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDFSECURITY=HIGH</td>
<td>PDFSECURITY=HIGH</td>
<td>PDFSECURITY=HIGH</td>
</tr>
<tr>
<td>Printing</td>
<td>High Resolution</td>
<td>Low Resolution (150 dpi)</td>
</tr>
</tbody>
</table>

See Also

- “Securing ODS-Generated PDF Files” on page 136

System Options:

- “PDFPAGEVIEW= System Option” on page 69
PDFSECURITY= System Option

Specifies the level of encryption for PDF documents.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Categories: Log and Procedure Output Control: PDF
System Administration: Security

Default: The shipped default is NONE.

Restriction: The PDFSECURITY option is valid for UNIX, Windows, and z/OS operating systems, but only in countries where importing encryption software is legal.

Requirement: Adobe Acrobat Reader or Professional 3.0 and later versions, unless otherwise noted.

Note: This option can be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

PDFSECURITY=HIGH | NONE

Syntax Description

HIGH
specifies that SAS encrypts PDF documents using a 128-bit encryption algorithm.

Requirement When PDFSECURITY=HIGH, you must use Acrobat 5.0 or later version.

Interaction At least one password must be set using the PDFPASSWORD= system option when PDFSECURITY=HIGH.

NONE
specifies that no encryption is performed on PDF documents.

The document property values for PDF security are not changed when you set PDFSECURITY=NONE. The results are the same as not specifying the option at all.

Details

The following table shows the default document properties that are set when the PDFSECURITY= option is set to NONE or HIGH. When PDFSECURITY=NONE, there are no restrictions on PDF documents.
### PDFSECURITY= System Option

<table>
<thead>
<tr>
<th></th>
<th>NONE</th>
<th>HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing</td>
<td>Allowed</td>
<td>High Resolution</td>
</tr>
<tr>
<td>Changing the Document</td>
<td>Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Commenting</td>
<td>Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Form Field Fill-in or</td>
<td>Allowed</td>
<td>Allowed</td>
</tr>
<tr>
<td>Signing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Document Assembly</td>
<td>Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Content Copying</td>
<td>Allowed</td>
<td>Allowed</td>
</tr>
<tr>
<td>Document Editing Enabled</td>
<td>Allowed</td>
<td>Allowed</td>
</tr>
<tr>
<td>Page Extraction</td>
<td>Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td>Encryption Level</td>
<td>None</td>
<td>128-bit RC4</td>
</tr>
</tbody>
</table>

**Note:** Document properties might differ between the Documents Security window, the Show Details window, and SAS PDF option values for secure documents. The values might differ if a document password has only an Open password, or if the Open and Owner passwords are the same value. These windows display property values correctly when both Open and Owner have passwords, the passwords are not the same, and the document is opened with the Open password.

**See Also**
- “Securing ODS-Generated PDF Files” on page 136

**System Options:**
- “PDFACCESS System Option” on page 60
- “PDFASSEMBLY System Option” on page 62
- “PDFCOMMENT System Option” on page 63
- “PDFCONTENT System Option” on page 64
- “PDFCOPY System Option” on page 65
- “PDFFILLIN System Option” on page 67
- “PDFPASSWORD= System Option” on page 70
- “PDFPRINT= System Option” on page 72
PRINTERPATH= System Option

Specifies the name of a registered printer to use for Universal Printing.

Valid in:
- SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP= 

Defaults:
- Under UNIX and z/OS, the default is PostScript Level 1.
- Under Windows, there is no default.

Note: This option cannot be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.

Syntax

PRINTERPATH=('printer-name' <fileref>)

Syntax Description

'printer-name'
- must be one of the printers defined in the Registry Editor under Core ➤ Printing ➤ Printers
- Requirement When the printer name contains blanks, you must enclose it in quotation marks.

<fileref>
- is an optional fileref. If a fileref is specified, it must be defined with a FILENAME statement or an external allocation. If a fileref is not specified, the default output destination can specify a printer in the Printer Setup dialog box, which you open by selecting File ➤ Printer Setup. Parentheses are required only when a fileref is specified.

Details

If the PRINTERPATH= option is not a null string, then Universal Printing is used. If the PRINTERPATH= option does not specify a valid Universal Printing printer, then the default Universal Printer is used.

Comparisons

A related system option SYSPRINT specifies which operating system printer is used for printing. PRINTERPATH= specifies which Universal Printing printer is used for printing.
The operating system printer specified by the SYSPRINT option is used when PRINTERPATH="" (two double quotation marks with no space between them sets a null string).

Example

The following example specifies an output destination that is different from the default:

```sas
options PRINTERPATH=(corelab out);
filename out 'your_file';
```

Operating Environment Information: In some operating environments, setting the PRINTERPATH= option might not change the setting of the PMENU print button, which might continue to use operating environment printing. See the SAS documentation for your operating environment for more information.

The PRINTERPATH option is used only for ODS PRINTER and when the DEVICE= system option is set to SASPRTC, SASPRTRTG, SASPRTM, or SASPRT. If DEVICE=WINPRTC, WINPRTG, or WINPRTM, the devices behave respectively as SASPRTC, SASPRTG, or SASPRTM.

See Also

- "Universal Printing" in SAS Language Reference: Concepts

Statements:


### RIGHTMARGIN= System Option

Specifies the print margin for the right side of the page.

**Valid in:**
- SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)
- PROC OPTIONS GROUP=ODSPRINT

**Category:** Log and Procedure Output Control: ODS Printing

**Default:** The shipped default is 0.000 in.

**Note:** This option cannot be restricted by a site administrator. For more information, see "Restricted Options" in SAS System Options: Reference.

**Syntax**

```
RIGHTMARGIN=margin-size<margin-unit>
```
Syntax Description

*margin-size*

specifies the size of the margin.

Restriction The right margin should be small enough so that the left margin plus the right margin is less than the width of the paper.

Interaction Changing the value of this option might result in changes to the value of the LINESIZE= system option.

<margin-unit>

specifies the units for margin-size. The margin-unit can be *in* for inches or *cm* for centimeters. <margin-unit> is saved as part of the value of the RIGHTMARGIN system option.

Default inches

Details

All margins have a minimum that is dependent on the printer and the paper size.

See Also

Statements:


System Options:

- “BOTTOMMARGIN= System Option” on page 47
- “LEFTMARGIN= System Option” on page 55
- “TOPMARGIN= System Option” on page 78

---

**TOPMARGIN= System Option**

Specifies the print margin at the top of the page.

Valid in: SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9_OPTIONS environment variable (Linux only)

Category: Log and Procedure Output Control: ODS Printing

PROC OPTIONS GROUP= ODSPRINT

Default: The shipped default is 0.000 in.

Note: This option cannot be restricted by a site administrator. For more information, see “Restricted Options” in SAS System Options: Reference.
Syntax

\texttt{TOPMARGIN=margin-size<margin-unit>}

Syntax Description

\textit{margin-size}

specifies the size of the margin.

\textbf{Restriction}

The bottom margin should be small enough so that the top margin plus the bottom margin is less than the height of the paper.

\textbf{Interaction}

Changing the value of this option might result in changes to the value of the \texttt{PAGESIZE=} system option.

\textit{<margin-unit>}

specifies the units for \textit{margin-size}. The margin-unit can be \textit{in} for inches or \textit{cm} for centimeters. \textit{<margin-unit>} is saved as part of the value of the \texttt{TOPMARGIN} system option.

\textbf{Default} inches

Details

All margins have a minimum that is dependent on the printer and the paper size. The default value of the \texttt{TOPMARGIN} system option is 0.00 \textit{in}.

See Also


Statements:


System Options:

- “\texttt{BOTTOMMARGIN=} System Option” on page 47
- “\texttt{LEFTMARGIN=} System Option” on page 55
- “\texttt{RIGHTMARGIN=} System Option” on page 77

\textbf{UPRINTCOMPRESSION System Option}

Specifies whether to enable the compression of files created by some Universal Printer and SAS/GRAPH devices.

\textbf{Valid in:}

- SAS 9.4: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window, SASV9\_OPTIONS environment variable (UNIX only), SAS Viya: Configuration file, SAS invocation, OPTIONS statement, SASV9\_OPTIONS environment variable (Linux only)

\textbf{Category:}

Log and Procedure Output Control: ODS Printing
**Syntax**

**UPRINTCOMPRESSION | NOUPRINTCOMPRESSION**

**Syntax Description**

**UPRINTCOMPRESSION**

specifies to enable compression of files created by some Universal Printers and some SAS/GRAPH devices.

**NOUPRINTCOMPRESSION**

specifies to disable compression of files created by some Universal Printers and some SAS/GRAPH devices.

**Details**

The following table lists the Universal Printers and the SAS/GRAPH devices that are affected by the UPRINTCOMPRESSION system option:

<table>
<thead>
<tr>
<th>Universal Printers</th>
<th>SAS/GRAPH Device Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCL5, PCL5C, PCL5E</td>
<td>PCL5, PCL5C, PCL5E</td>
</tr>
<tr>
<td>PDF</td>
<td>PDF, PDFA, PDFC</td>
</tr>
<tr>
<td>SVG</td>
<td>SVG</td>
</tr>
<tr>
<td>PS</td>
<td>SASPRTC, SASPRTG, SASPRTM</td>
</tr>
</tbody>
</table>

When NOUPRINTCOMPRESSION is set, the DEFLATION= option is ignored. The ODS PRINTER statement option, COMPRESS=, takes precedence over the UPRINTCOMPRESSION system option.

**See Also**

**Statements:**


**System Options:**
“DEFLATION= System Option” on page 52
PART 5

SAS Statements Applicable to Universal Printing

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SAS ODS Statements That Produce Output in SAS Studio

Dictionary

ODS HTML5 Statement

Opens, manages, or closes the HTML5 destination, which produces HTML 5.0 output that contains embedded style sheets.

Category: ODS: Third-Party Formatted

Defaults:
The default style is HTMLBlue when using SAS Studio.

SVG is the default Universal Printer and the device driver for the ODS HTML5 destination. When using the ODS HTML5 destination in SAS Studio, the device driver is set to PNG.

Restriction: The ODS HTML5 destination does not support table cell padding or spacing. Use CSS for ODS HTML5 to produce padding and spacing.

See: For details about viewing SVG graphics, see “Browser Support for Viewing SVG Files” in SAS/GRAPH: Reference.

Example: “Example 1: ODS Graphics SVG Graph in an HTML5 File” on page 114

Syntax

ODS HTML5 <(<ID= identifier)> < action> ;
ODS HTML5 <(<ID= identifier)> <options> ;

Summary of Optional Arguments

(ID= identifier)
Open multiple instances of the same destination at the same time

**ACCESSIBLE_GRAPH**
Add accessibility metadata to graphs that are created by ODS Graphics

**ANCHOR=’anchor-name’**
Specify a unique base name for the anchor tag that identifies each output object in the current body file

**BASE=’base-text’**
Specify text to use as the first part of all links and references that ODS creates in output files

**BODY=’file-specification’ (suboptions)**
Open a markup family destination and specify the file that contains the primary output that is created by the ODS statement

**BOX_SIZING=(CONTENT_BOX | BORDER_BOX)**
Specify how to measure the width of cells. Use to override the default value of BOX_SIZING for a destination

**CHARSET=character-set**
Specify the character set to be generated in the META declaration for the HTML output

**CODE=’file-specification’ <(suboptions)>**
Open the HTML destination and specify the file that contains relevant style information

**CONTENTS=’file-specification’ <(suboptions)>**
Open the HTML5 destination and specify the file that contains a table of contents for the output

**CSSSTYLE=’file-specification’<(media-type1<...media-type-10>)>**
Specify a cascading style sheet to apply to your output

**DEVICE= device-driver**
Specify a device for the output destination

**DOM<”external-file”>**
Specify that the ODS document object model is written to the SAS log or to an external file

**ENCODING=local-character-set-encoding**
Override the encoding for input or output processing (transcodes) of external files

**EXCLUDE exclusion(s) | ALL | NONE**
Exclude output objects from the destination

**FRAME=’file-specification’ <(suboptions)>**
Specify the file that integrates the table of contents, the page contents, and the body file

**GFOOTNOTE**
**NOGFOOTNOTE**
Control the location where footnotes are printed in the graphics output

**GPATH=’aggregate-file-storage-specification’ | fileref (URL= | libref.catalog ‘Uniform-Resource-Locator’ | NONE)**
Specify the location for all graphics output that is generated while the destination is open

**GTITLE**
**NOGTITLE**
Control the location where titles are printed in the graphics output

**HEADTEXT=’markup-document-head’**
Specify HTML tags to place between the `<HEAD>` and `</HEAD>` tags in all of the output files.

**IMAGE_DPI=**
Specify the image resolution for graphical output

**METATEXT= 'metatext-for-document-head'**
Specify HTML code to use as the `<META>` tag between the `<HEAD>` and `</HEAD>` tags in all of the HTML output files.

**NEWFILE= starting-point**
Create a new body file at the specified starting point

**OPTIONS ( BITMAP_MODE= | GRAPH_BITMAP_MODE= | STYLE_BITMAP_MODE= | GRAPH_SVG_MODE= | STYLE_SVG_MODE | SHOW_GRAPH_STYLES= | RESET )**
Specify suboptions and a named value for how images are handled using the HTML5 destination

**PACKAGE <package-name>**
Specify that the output from the destination be added to an ODS package

**PAGE= 'file-specification' <(suboptions)>**
Open the HTML destination and specify the file that contains a description of each page of the body file and contains links to the body file

**PARAMETERS= (parameter-pair-1 ... parameter-pair-n)**
Write the specified parameters between the tags that generate dynamic graphics output

**PATH=’aggregate-file-storage-specification’ | fileref (URL= | libref.catalog ‘Uniform-Resource-Locator’ | NONE)**
Specify the location of an aggregate storage location or a SAS catalog for all markup files

**RECORD_SEPARATOR= ’alternative-separator’ | NONE**
Specify an alternative character or string to separate lines in the output files

**SELECT selection(s) | ALL | NONE**
Select output objects for the destination.

**SHOW**
Write to the SAS log the current selection or exclusion list for the destination

**STYLE= style-template**
Specify a style template to use in writing output files

**STYLESHEET= ’file-specification’ <(suboptions)>**
Open the HTML destination and place style information for output into an external file, or read style sheet information from an existing file

**TEXT=text-string**
Insert text into your document

**TRANTAB= ’translation-table’**
Specify a translation table to use when transcoding a file for output

**noViya**

**SGE=ON | YES | OFF | NO**
Generate a file that can be edited with the ODS Graphics Editor

Without Arguments

If you use the ODS HTML5 statement without an action or options, then it opens the HTML5 destination and creates HTML5 output.
Actions

The following actions are available for the ODS HTML5 statement.

**EXCLUDE exclusion(s) | ALL | NONE**

excludes one or more output objects from the destination.

| Default | NONE |
| Restriction | A destination must be open for this action to take effect. |
| See | “ODS EXCLUDE Statement” in *SAS Output Delivery System: Procedures Guide* |

**SELECT selection(s) | ALL | NONE**

selects output objects for the specified destination.

| Default | ALL |
| Restriction | A destination must be open for this action to take effect. |
| See | “ODS SELECT Statement” in *SAS Output Delivery System: Procedures Guide* |

**SHOW**

writes the current selection list or exclusion list for the destination to the SAS log.

| Restriction | The destination must be open for this action to take effect. |
| Tip | If the selection or exclusion list is the default list (SELECT ALL), then SHOW also writes the entire selection or exclusion list. For information about selection and exclusion lists, see “Selection and Exclusion Lists” in *SAS Output Delivery System: User’s Guide*. |
| See | “ODS SHOW Statement” in *SAS Output Delivery System: User’s Guide* |

Optional Arguments

**ANCHOR= 'anchor-name'**

specifies a unique base name for the anchor tag that identifies each output object in the current body file.

Each output object has an anchor tag for the contents, page, and frame files to reference. The links and references are automatically created by ODS. The links and references point to the name of an anchor. Therefore, each anchor name in a file must be unique.

anchor-name

is the base name for the anchor tag that identifies each output object in the current body file.

ODS creates unique anchor names by incrementing the name that you specify. ODS assumes that if the anchor name ends in a number, then the number should be treated as a starting point for incrementing the anchor names.

For example, if you specify ANCHOR= 'PRINT', then ODS names the first anchor `print`. The second anchor is named `print1`, the third is named `print2`, and so on.
Similarly, if you specify ANCHOR="PRINT1", then ODS names the first anchor print1. The second anchor is named print2.

Restrictions: Each anchor name in a file must be unique.

Only alphanumeric values, the special characters "$ - _ . + ! * ' () , " and reserved characters used for their reserved purposes can be used unencoded within a URL.

Requirement: You must enclose anchor-name in quotation marks.

Interaction: If you open a file to append to it, be sure to specify a new anchor name to prevent writing the same anchors to the file again. ODS does not recognize anchors that are already in a file when it opens the file.

Tips: You can change anchor names as often as you want by specifying the ANCHOR= option in a markup family statement anywhere in your program. After you have specified an anchor name, it remains in effect until you specify a new one.

Specifying new anchor names at various points in your program is useful when you want other web pages to link to specific parts of your markup language output. Because you can control where the anchor name changes, you know in advance what the anchor name is at those points.

An anchor-name must begin with a letter ([A-Za-z]) and can be followed by any number of letters, digits ([0-9]), hyphens (-), underscores (_), colons (:), and periods (.).

ACCESSIBLE_GRAPH | NOACCESSIBLE_GRAPH

adds accessibility metadata to graphs that are created by ODS Graphics. Users with a wide range of abilities will access the accessibility metadata using a companion product to ODS Graphics that will be released in the near future.

Default: \( \text{NOACCESSIBLE_GRAPH} \)

BASE= 'base-text'
specifies the text to use as the first part of all links and references that ODS creates in the output files.

base-text

is the text that ODS uses as the first part of all links and references that ODS creates in the file. Consider this specification:

\( \text{BASE= 'http://www.your-company.com/local-url/'} \)

In this case, ODS creates links that begin with the string http://www.your-company.com/local-url/. The appropriate anchor-name completes the link.

Requirement: You must enclose base-text in quotation marks.

BODY= 'file-specification' (suboptions)

opens a markup family destination and specifies the file that contains the primary output that is created by the ODS statement. These files remain open until you do one of the following:

- close the destination with either an ODS markup-family-destination CLOSE statement or ODS _ALL_ CLOSE statement.
open the same destination with a second markup family statement. This closes the first file and opens the second file.

**file-specification**
specifies the file, fileref, or SAS catalog to write to.

**file-specification** is one of the following:

**external-file**
is the name of an external output file.

**Requirement** You must enclose external-file in quotation marks.

**fileref**
is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

**Restriction** The BODY=fileref option cannot be used in conjunction with the NEWFILE= option.

**See** For information about the FILENAME statement, see “FILENAME Statement” in SAS Global Statements: Reference.

**entry.markup**
specifies an entry in a SAS catalog to write to.

**Interaction** If you specify an entry name, you must also specify a library and catalog. See the discussion of the PATH= option.

**(suboptions)**
specifies one or more suboptions in parentheses. Suboptions are instructions for writing the output files. Suboptions can be the following:

**(DYNAMIC)**
enables you to send output directly to a web server instead of writing it to a file.

**See** For complete documentation about the DYNAMIC suboption, see “(DYNAMIC)” on page 110.

**(NO_BOTTOM_MATTER)**
specifies that no ending markup language source code be added to the output file.

**See** For complete documentation about the NO_BOTTOM_MATTER suboption, see “(NO_BOTTOM_MATTER)” on page 110.

**(NO_TOP_MATTER)**

**See** For complete documentation about the NO_TOP_MATTER suboption, see “(NO_TOP_MATTER)” on page 111.

**(TITLE='title-text')**
inserts into the metadata of a file the text string that you specify as the text to appear in the browser window title bar.

**See** For complete documentation about the TITLE= suboption, see “(TITLE='title-text’)” on page 111.
**FILE=**

Interaction: Using the BODY= option in an ODS markup family statement that refers to an open ODS markup destination forces ODS to close the destination and all associated files. ODS then opens a new instance of the destination. For more information see "Opening and Closing the MARKUP Destination" in SAS Output Delivery System: User’s Guide.

**Note:** For some values of TAGSET=, this output is an HTML file. For other TAGSET= values, the output is an XML file, and so on.

**Tip:** When you use the ODS HTML statement with the FILE= option to specify a fully-qualified path with a directory and a file name, the best practice for generating HTML files is to separate the path from the file. To accomplish this, use a combination of the PATH= option, which specifies the directory, and the FILE= option, which names the actual file. For example:

```plaintext
ods html path="c:\temp" file="myfile.html";
proc print data=sashelp.class;
run;
ods html close;
```

**BOX_SIZING=(CONTENT_BOX | BORDER_BOX)**

specifies how to measure the width of cells. This option overrides the default value of BOX_SIZING for a destination. The default value can be found in the SAS registry. For information about using the SAS Registry, see “Changing SAS Registry Settings for ODS” in SAS Output Delivery System: User’s Guide.

BOX_SIZING is defined by the WC3 specification, the CSS3 Module. For more information, refer to the CSS3 Box Model specification at http://www.w3.org/TR/2002/WD-css3-box-20021024/#box-sizing.

**CHARSET= character-set**

specifies the character set to be generated in the META declaration for the HTML output.


**CODE= 'file-specification' <(suboptions)>**

opens a markup family destination and specifies the file that contains accompanying programming code, such as JavaScript or XSL (Extensible Stylesheet Language). These files remain open until you do one of the following:

- close the destination with either an ODS markup-family-destination CLOSE statement or ODS _ALL_ CLOSE statement.
- open the same destination with a second markup family statement. This closes the first file and opens the second file.

**file-specification**

specifies the file, fileref, or SAS catalog to write to.

**file-specification** is one of the following:
external-file
   is the name of an external output file.
   Requirement You must enclose external-file in quotation marks.

fileref
   is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

entry.markup
   specifies an entry in a SAS catalog to write to.
   Interaction If you specify an entry name, you must also specify a library and catalog. See the discussion of the PATH= option.

suboptions
   specifies one or more suboptions in parentheses. Suboptions are instructions for writing the output files. Suboptions can be the following:

   (DYNAMIC)
      enables you to send output directly to a web server instead of writing it to a file.
      See For complete documentation about the DYNAMIC suboption, see “(DYNAMIC)” on page 110.

   (URL= 'Uniform-Resource-Locator')
      specifies a URL for the file-specification. ODS uses this URL (instead of the filename) in all the links and references that it creates and that point to the file.
      See For complete documentation about the URL= suboption, see “(URL= 'Uniform-Resource-Locator’)” on page 112.

CONTENTS= 'file-specification' <(suboptions)>
   opens the HTML5 destination and specifies the file that contains a table of contents for the output. These files remain open until you do one of the following:
   ▪ close the destination with either an ODS markup-family-destination CLOSE statement or ODS _ALL_ CLOSE statement.
   ▪ open the same destination with a second markup family statement. This closes the first file and opens the second file.

file-specification
   specifies the file, fileref, or SAS catalog to write to.

file-specification is one of the following:

external-file
   is the name of an external output file.
   Requirement You must enclose external-file in quotation marks.

fileref
   is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.
entry.markup

specifies an entry in a SAS catalog to write to.

Interaction If you specify an entry name, you must also specify a library and catalog. See the discussion of the PATH= option.

suboptions

specifies one or more suboptions in parentheses. Suboptions are instructions for writing the output files. Suboptions can be the following:

(DYNAMIC)

enables you to send output directly to a web server instead of writing it to a file.

See For complete documentation about the DYNAMIC suboption, see “(DYNAMIC)” on page 110.

(NO_BOTTOM_MATTER)

specifies that no ending markup language source code be added to the output file.

See For complete documentation about the NO_BOTTOM_MATTER suboption, see “(NO_BOTTOM_MATTER)” on page 110.

(NO_TOP_MATTER)

specifies that no beginning markup language source code be added to the top of the output file. For HTML 4.0, the NO_TOP_MATTER option removes the style sheet.

See For complete documentation about the NO_TOP_MATTER suboption, see “(NO_TOP_MATTER)” on page 111.

(TITLE='title-text')

inserts into the metadata of a file the text string that you specify as the text to appear in the browser window title bar.

title-text

is the text in the metadata of a file that indicates the title.

See For complete documentation about the TITLE= suboption, see “(TITLE='title-text')” on page 111.

(URL= 'Uniform-Resource-Locator' )

specifies a URL for the file-specification. ODS uses this URL (instead of the filename) in all the links and references that it creates and that point to the file.

See For complete documentation about the URL= suboption, see “(URL= 'Uniform-Resource-Locator' )” on page 112.

CSSSTYLE='file-specification'\(\text{(media-type1<...media-type-10>})\)

specifies a cascading style sheet to apply to your output.

file-specification

specifies a file, fileref, or URL that contains CSS code.
**file-specification** is one of the following:

"**external-file**"

is the name of the external file.

**Requirement** You must enclose **external-file** in quotation marks.

**fileref**

is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

**See** For information about the FILENAME statement, see *SAS DATA Step Statements: Reference*.

"**URL**"

is a URL to an external file.

**Requirement** You must enclose **URL** in quotation marks.

**(media-type-1<.., media-type-10>)**

specifies one or more media blocks that correspond to the type of media that your output is rendered on. CSS uses media type blocks to specify how a document is to be presented on different media: on the screen, on paper, with a speech synthesizer, with a braille device, and so on.

The media block is added to your output in addition to the CSS code that is not contained in any media blocks. By using the media-type suboption, in addition to the general CSS code, you can import the section of a CSS file intended only for a specific media type.

**Default** If no media-type is specified in your ODS statement, but you do have media types specified in your CSS file, then ODS uses the Screen media type.

**Range** You can specify up to ten different media types.

**Requirements** You must enclose **media-type** in parentheses.

You must specify **media-type** next to the **file-specification** specified by the CSSSTYLE= option.

**Tip** If you specify multiple media types, all of the style information in all of the media types is applied to your output. However, if there is duplicate style information in different media blocks, then the styles from the last media block are used.

**Interaction** If both the STYLE= option and the CSSSTYLE= option are specified in an ODS statement, the option specified last is the option that is used.

**See** For an example of a valid for ODS CSS file, see “Applying a CSS File to ODS Output” in *SAS Output Delivery System: User’s Guide*.

**DOM<="external-file">**

specifies that the ODS document object model is written to the SAS log or an external file.

**external-file**

is the name of an external output file.
Requirement  You must enclose `external-file` in quotation marks.

See  For complete documentation about the ODS document object model, see “Working with the ODS Document Object Model” in SAS Output Delivery System: Advanced Topics.

**DEVICE= device-driver**

specifies the name of a device driver. ODS automatically selects an optimal default device for each open output destination.

The following table lists the default devices for the most common ODS output destinations. These default devices are used when graphics are created using SAS/GRAPH or ODS Graphics. In the third maintenance release of SAS 9.4, EPUB3 is the default EPUB destination. EPUB2 was the default EPUB version in prior releases of SAS 9.4. This default is set in the Registry. For a complete list of supported devices and file types, see “Supported File Types for Output Destinations” in SAS ODS Graphics: Procedures Guide.

Table 6.1  Default Devices for ODS Output Destinations

<table>
<thead>
<tr>
<th>Output Destination</th>
<th>Default Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPUB2</td>
<td>PNG</td>
</tr>
<tr>
<td>EPUB3 (EPUB)</td>
<td>SVG</td>
</tr>
<tr>
<td>Excel</td>
<td>PNG</td>
</tr>
<tr>
<td>HTML</td>
<td>PNG</td>
</tr>
<tr>
<td>HTML5</td>
<td>SVG</td>
</tr>
<tr>
<td>LISTING</td>
<td>PNG</td>
</tr>
<tr>
<td>Measured RTF</td>
<td>EMF</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>PNG</td>
</tr>
<tr>
<td>RTF</td>
<td>EMF</td>
</tr>
<tr>
<td>Markup Tagsets</td>
<td>PNG</td>
</tr>
</tbody>
</table>

Tip  Specifying a device on the ODS DEVICE= option takes precedence over the SAS global option and the graphics option.


**ENCODING= local-character-set-encoding**

overrides the encoding for input or output processing (transcodes) of external files.
FRAME= 'file-specification' <(suboptions)> 
opens a markup family destination and, for HTML output, specifies the file that integrates the table of contents, the page contents, and the body file. If you open the frame file, then you see a table of contents, a table of pages, or both, as well as the body file. For XML output, FRAME= specifies the file that contains the DTD. These files remain open until you do one of the following:

- close the destination with either an ODS markup-family-destination CLOSE statement or ODS _ALL_ CLOSE statement.
- open the same destination with a second markup family statement. This closes the first file and opens the second file.

file-specification 
specifies the file, fileref, or SAS catalog to write to.

file-specification is one of the following:

external-file 
is the name of an external output file.

Requirement  You must enclose external-file in quotation marks.

fileref 
is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

See  For information about the FILENAME statement, see “FILENAME Statement” in SAS Global Statements: Reference.

entry.markup 
specifies an entry in a SAS catalog to write to.

Interaction  If you specify an entry name, you must also specify a library and catalog. See the discussion of the PATH= option.

suboptions 
specifies one or more suboptions in parentheses. Suboptions are instructions for writing the output files. Suboptions can be the following:

(DYNAMIC) 
enables you to send output directly to a web server instead of writing it to a file.

See  For complete documentation about the DYNAMIC suboption, see “(DYNAMIC)” on page 110.

(NO_BOTTOM_MATTER) 
specifies that no ending markup language source code be added to the output file.

See  For complete documentation about the NO_BOTTOM_MATTER suboption, see “(NO_BOTTOM_MATTER)” on page 110.
(NO_TOP_MATTER)
specifies that no beginning markup language source code be added to
the top of the output file. For HTML 4.0, the NO_TOP_MATTER option
removes the style sheet.

See For complete documentation about the NO_TOP_MATTER
suboption, see “(NO_TOP_MATTER)” on page 111.

(TITLE='title-text')
inserts into the metadata of a file the text string that you specify as the
text to appear in the browser window title bar.

    title-text

    is the text in the metadata of a file that indicates the title.

See For complete documentation about the TITLE= suboption, see
“(TITLE='title-text’)” on page 111.

(URL= 'Uniform-Resource-Locator')
specifies a URL for the file-specification. ODS uses this URL (instead of
the filename) in all the links and references that it creates and that point to
the file.

See For complete documentation about the URL= suboption, see “(URL=
'Uniform-Resource-Locator’ )” on page 112.

Restriction If you specify the FRAME= option, then you must also specify the
CONTENTS= option, the PAGE= option, or both.

Example “Creating an XML File and a DTD” in SAS Output Delivery System:
User’s Guide

GFOOTNOTE | NOGFOOTNOTE
controls the location where footnotes are printed in the graphics output.

GFOOTNOTE
writes footnotes that are created by SAS/GRAPH, the SGPLOT procedure,
the SGPANEL procedure, or the SGSCATTER procedure. The footnotes
appear inside the graph borders.

NOGFOOTNOTE
writes footnotes that are created by ODS, which appear outside the graph
borders.

Default GFOOTNOTE

Restrictions Footnotes that are displayed by a markup language statement
support all SAS/GRAPH FOOTNOTE statement options. The font
must be valid for the browser. Options that ODS cannot handle,
such as text angle specifications, are ignored. For details about the
SAS/GRAPH FOOTNOTE statement, see “FOOTNOTE Statement”
in SAS/GRAPH: Reference.

This option applies only to SAS programs that produce one or more
device-based graphics, or graphics created by the SGPLOT
procedure, the SGPANEL procedure, or the SGSCATTER
procedure.
GPATH=’aggregate-file-storage-specification’ | fileref (URL= | libref.catalog)
"Uniform-Resource-Locator" | NONE

specifies the location for all graphics output that is generated while the
destination is open. Use this option when you want to write graphics output files
to a location different that specified by the PATH= option for markup files. If you
specify an invalid filename, the ActiveX and Java devices send output to the
default filename. Other devices create the file as a directory and write output to
that directory using the default filename. For information about how ODS names
catalog entries and external files, see SAS/GRAPH: Reference.

’aggregate-file-storage-location’
specifies an aggregate storage location such as directory, folder, or
partitioned data set.

Requirements
You must enclose aggregate-file-storage-location in quotation
marks.

The specified aggregate-file-storage-location must exist in the
file system.

fileref
is a file reference that has been assigned to an aggregate storage location.
Use the FILENAME statement to assign a fileref.

Interaction
If you specify a fileref in the GPATH= option, then ODS does not
use information from the GPATH= option when it constructs links.

See
For information about the FILENAME statement, see “FILENAME
Statement” in SAS Global Statements: Reference.

libref.catalog
specifies a SAS catalog to write to.

URL= ’Uniform-Resource-Locator’ | NONE
specifies a URL for file-specification.

Uniform-Resource-Locator
is the URL that you specify. ODS uses this URL instead of the filename in
all the links and references that it creates to the file.

Requirement
You must enclose Uniform-Resource-Locator in quotation
marks.

NONE
specifies that no information from the GPATH= option appears in the links
or references.

Tip
This option is useful for building output files that can be moved from one
location to another. If the links from the contents and page files are
constructed with a simple URL (one name), then they resolve, as long
as the contents, page, and body files are all in the same location.

Default
If you omit the GPATH= option, then ODS stores graphics in the location
that is specified by the PATH= option. If you do not specify the PATH= option, then ODS stores the graphics in the current directory. For more
information, see the PATH= option.

GTITLE | NOGTITLE
controls the location where titles are printed in the graphics output.
GTITLE
writes the title that is created by SAS/GRAPH, the SGPLOT procedure, the SGPANEL procedure, or the SGSCATTER procedure. The title appears inside the graph borders.

NOGTITLE
writes the title that is created by ODS, which appears outside of the graph borders.

Default
GTITLE

Restrictions
Titles that are displayed by any markup language statement support most SAS/GRAPH TITLE statement options. The font must be valid for the browser. Options that ODS cannot handle, such as text angle specifications, are ignored. For details about the SAS/GRAPH TITLE statement, see TITLE statement.

This option applies only to SAS programs that produce one or more device-based graphics, or graphics created by the SGPLOT procedure, the SGPANEL procedure, or the SGSCATTER procedure.

HEADTEXT= 'markup-document-head'
specifies markup tags to place between the <HEAD> and </HEAD> tags in all of the output files.

markup-document-head
specifies the markup tags to place between the <HEAD> and </HEAD> tags.

Restriction
HEADTEXT= cannot exceed 256 characters.

Requirement
You must enclose markup-document-head in quotation marks.

Tips
ODS cannot parse the markup that you supply. It should be well-formed markup that is correct in the context of the <HEAD> and </HEAD> tags.

Use the HEADTEXT= option to define programs (such as JavaScript) that you can use later in the file.

(ID= identifier)
enables you to run multiple instances of the same destination at the same time. Each instance can have different options.

identifier
specifies another instance of the destination that is already open. identifier is numeric or a series of characters that begin with a letter or an underscore. Subsequent characters can include letters, underscores, and numeric characters.

Restriction
If identifier is numeric, it must be a positive integer.

Requirement
You must specify the ID= option immediately after the destination name.

Tip
You can omit the ID= option and instead use a name or a number to identify the instance.
Example 1: Opening Multiple Instances of the Same Destination at the Same Time on page 140

**IMAGE_DPI=**
specifies the image resolution for graphical output.

<table>
<thead>
<tr>
<th>Alias</th>
<th>DPI=</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default</td>
<td>96</td>
</tr>
</tbody>
</table>

**CAUTION**
Caution: When using high DPI= or DPI_IMAGE values (values over 1000), you might need to increase memory allocations. To increase memory, set the MEMSIZE= system option to 500M or higher. You can also decrease the DPI= value to ensure that you do not run out of memory.

**METATEXT= 'metatext-for-document-head'**
specifies HTML code to use as the <META> tag between the <HEAD> and </HEAD> tags of all of the HTML output files.

'**metatext-for-document-head**'
specifies the HTML code that provides the browser with information about the document that it is loading. For example, this attribute could specify the content type and the character set to use.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>You must enclose metatext-for-document-head in quotation marks.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Default</th>
<th>If you do not specify METATEXT=, then ODS writes a simple &lt;META&gt; tag, which includes the content-type of the document and the character set to use, to all the HTML files that it creates.</th>
</tr>
</thead>
</table>

**Restriction**
METATEXT= cannot exceed 256 characters.

**Tip**
ODS cannot parse the HTML code that you supply. It should be well-formed HTML code that is correct in the context of the <HEAD> tags. If you are using METATEXT= as it is intended, then your META tag should look like this:

```html
<META your-metatext-is-here>
```

**NEWFILE= starting-point**
creates a new body file at the specified starting-point.

**starting-point**
is the location in the output where you want to create a new body file.

ODS automatically names new files by incrementing the name of the body file. In the following example, ODS names the first body file REPORT.XML. Additional body files are named REPORT1.XML, REPORT2.XML, and so on.

Example:

BODY= 'REPORT.XML'

**starting-point** is one of the following:

**BYGROUP**
starts a new file for the results of each BY group.
writes all output to the body file that is currently open.

OUTPUT
starts a new body file for each output object. For SAS/GRAPH this means that ODS creates a new file for each SAS/GRAPH output file that the program generates.

Alias TABLE

PAGE
starts a new body file for each page of output. A page break occurs when a procedure explicitly starts a new page (not because the page size was exceeded) or when you start a new procedure.

PROC
starts a new body file each time you start a new procedure.

Default NONE

Restriction The NEWFILE= option cannot be used in conjunction with the BODY= fileref option.

Tips
If you end the filename with a number, then ODS begins incrementing with that number. In the following example, ODS names the first body file MAY5.XML. Additional body files are named MAY6.XML, MAY7.XML, and so on.

Example:
BODY= 'MAY5.XML'

OPTIONS ( BITMAP_MODE=SVG_MODE= | GRAPH_BITMAP_MODE= | STYLE_BITMAP_MODE= | GRAPH_SVG_MODE= | STYLE_SVG_MODE | SHOW_GRAPH_STYLES= | RESET)
specifies suboptions and a named value for how images are handled using the HTML5 destination. These values must be enclosed in parentheses.

BITMAP_MODE=GRAPH_BITMAP_MODE= | STYLE_BITMAP_MODE=
specifies how all bit mapped images are inserted into the HTML5 document. These values must be enclosed in parentheses.

Use the GRAPH_BITMAP_MODE and the STYLE_BITMAP_MODE to insert your style images and your graph images differently.

ods html5 options {bitmap_mode='object'};

Note: The BITMAP_MODE can be overridden by STYLE_BITMAP_MODE or by GRAPH_BITMAP_MODE.

EMBED
creates an HTML5 <embed> tag.

<embed src="c:\Public\arrow.png"/>

IMG
creates an HTML5 <img> tag that displays the image file.

<img src="c:\Public\arrow.png"/>

Default IMG is the default for displaying bit maps.
INLINE
inserts the image data into the HTML5 file. The image data is base64 encoded and is inserted into the document as a URL for bitmaps.

Restriction Inline graphs and images might not be supported by some email clients.

LINK
creates a hyperlink that points to the image file.

<a href="c:\Public\arrow.png" My Arrow PNG</a>

OBJECT
creates an HTML5 <object> tag that displays the image file. This tag is used to embed multimedia files and applications into your document (audio, video, Java applets, ActiveX, PDF, and Flash).

<object data="c:\Public\arrow.png" </object>

SVG_MODE=GRAPH_SVG_MODE= | STYLE_SVG_MODE=
specifies how all SVG images are inserted into the HTML5 document. These values must be enclosed in parentheses.

Use the GRAPH_SVG_MODE and the STYLE_SVG_MODE to insert your style images and your graph images differently.

ods html5 options {svg_mode='img'};

Note: The SVG_MODE can be overridden by STYLE_SVG_MODE or by GRAPH_SVG_MODE.

EMBED
creates an HTML5 <embed> tag.

<embed src="c:\Public\arrow.svg"/>

IMG
creates an HTML5 <img> tag that displays the image file.

<img src="c:\Public\arrow.svg"/>

Restriction In 9.4, an image map is not generated using SVG with ODS Graphics. The image map data that is used to produce tooltips and links is written directly in the SVG and is not part of the HTML5 document.

See For information about the browsers that support SVG graphs and compatibility mode, see “Browser Support for Viewing SVG Files” in SAS/GRAPH: Reference.

INLINE
inserts the image data into the HTML5 file. The image data is base64 encoded and is inserted into the document as a URL for bitmaps.

Default INLINE is the default for displaying SVG.

Restrictions The INLINE value for SVG_MODE is not supported on z/OS.

In 9.4, an image map is not generated using SVG with ODS Graphics. The image map data that is used to produce
toolips and links is written directly in the SVG and is not part of the HTML5 document.

Inline graphs and images might not be supported by some email clients.

**LINK**
creates a hyperlink that points to the image file.

```html
<a href="c:\Public\arrow.svg" My Arrow SVG</a>
```

**OBJECT**
creates an HTML5 `<object>` tag that displays the image file. This tag is used to embed multimedia files and applications into your document (audio, video, Java applets, ActiveX, PDF, and Flash).

```html
<object data="c:\Public\arrow.svg"</object>
```

**SHOW_GRAPH_STYLES='ON' | 'OFF'**
specifies that the output should contain elements from the graph style that is specified for CSS. These values must be enclosed in parentheses.

**ON**
specifies that the output should contain elements from the graph style that is specified for CSS.

**Aliases**
YES
TRUE

**Restriction**
These values must be enclosed in parentheses.

**OFF**
specifies that the output should not contain elements from the graph style that is specified for CSS.

**Aliases**
NO
FALSE

**Restriction**
These values must be enclosed in parentheses.

**Example**
```plaintext
ods html5 file=mycss style=styles.seaside dev=svg gpath=gout
options(show_graph_styles='on' svg_mode='embed');
```

**USE_CSS_RESET='ON' | 'OFF'**
turns on or off the default CSS styles information. This option works well with the SHOW_GRAPH_STYLES= suboption to provide a starting point to creating a style that works with the CSSSTYLE= option.

**OFF**
turns off the default CSS styles information.

**ON**
turns on the default CSS styles information.

**Requirement**
suboptions must be enclosed in parentheses.

**PACKAGE <package-name>**
specifies that the output from the destination be added to a package.
package-name
specifies the name of a package that was created with the ODS PACKAGE statement. If no name is specified, then the output is added to the unnamed package that was opened last.


PAGE='file-specification'<(suboptions)>
opens a markup family destination and specifies the file that contains a description of each page of the body file, and contains links to the body file. ODS produces a new page of output whenever a procedure requests a new page. These files remain open until you do one of the following:

- close the destination with either an ODS markup-family-destination CLOSE statement or ODS _ALL_ CLOSE statement.
- open the same destination with a second markup family statement. This closes the first file and opens the second file.

Note: SAS Studio provides its own table of contents navigation for HTML, negating the need for this option.

file-specification
specifies the file, fileref, or SAS catalog to write to.

file-specification is one of the following:

external-file
is the name of an external output file.

Requirement You must enclose external-file in quotation marks.

fileref
is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

See For information about the FILENAME statement, see “FILENAME Statement” in SAS Global Statements: Reference.

entry.markup
specifies an entry in a SAS catalog to write to.

Interaction If you specify an entry name, you must also specify a library and catalog. See the discussion of the PATH= option.

suboptions
specifies one or more suboptions in parentheses. Suboptions are instructions for writing the output files. Suboptions can be the following:

(DYNAMIC)
enables you to send output directly to a web server instead of writing it to a file.

See For complete documentation about the DYNAMIC suboption, see “(DYNAMIC)” on page 110.
(NO_BOTTOM_MATTER)
specifies that no ending markup language source code be added to the output file.

See For complete documentation about the NO_BOTTOM_MATTER suboption, see "(NO_BOTTOM_MATTER)" on page 110.

(NO_TOP_MATTER)
specifies that no beginning markup language source code be added to the top of the output file. For HTML 4.0, the NO_TOP_MATTER option removes the style sheet.

See For complete documentation about the NO_TOP_MATTER suboption, see "(NO_TOP_MATTER)" on page 111.

(TITLE='title-text')
inserts into the metadata of a file the text string that you specify as the text to appear in the browser window title bar.

	title-text

	is the text in the metadata of a file that indicates the title.

See For complete documentation about the TITLE= suboption, see "(TITLE='title-text')" on page 111.

(URL= 'Uniform-Resource-Locator')
specifies a URL for the file-specification. ODS uses this URL (instead of the filename) in all the links and references that it creates and that point to the file.

See For complete documentation about the URL= suboption, see "(URL= 'Uniform-Resource-Locator')" on page 112.

Interaction The SAS system option PAGESIZE= has no effect on pages in HTML output except when you are creating batch output. For information about the PAGESIZE= option, see “PAGESIZE= System Option” in SAS System Options: Reference.

PARAMETERS= (parameter-pair-1 ... parameter-pair-n)
writes the specified parameters between the tags that generate dynamic graphics output.

parameter-pair
specifies the name and value of each parameter. parameter-pair has the following form.

'parameter-name'= 'parameter-value'

parameter-name
is the name of the parameter.

parameter-value
is the value of the parameter.

Requirement You must enclose parameter-name and parameter-value in quotation marks.
Interaction Use PARAMETERS= in conjunction with SAS/GRAPH procedures and the DEVICE=JAVA, JAVAMETA, or ACTIVEX options in the GOPTIONS statement.

See SAS/GRAPH: Reference for valid parameters for the Graph Applet, Map Applet, Contour Applet, and the MetaView Applet.

**PATH=’aggregate-file-storage-specification’ | fileref (URL= | libref.catalog ‘Uniform-Resource-Locator’ | NONE)**

specifies the location of an aggregate storage location or a SAS catalog for all markup files. If the GPATH= option is not specified, all graphics output files are written to the "aggregate-file-storage-specification" or libref.

‘aggregate-file-storage-location’

specifies an aggregate storage location such as directory, folder, or partitioned data set.

**Requirement** You must enclose aggregate-file-storage-location in quotation marks.

**fileref**

is a file reference that has been assigned to an aggregate storage location. Use the FILENAME statement to assign a fileref.

**Interaction** If you use a fileref in the PATH= option, then ODS does not use information from PATH= when it constructs links.

**See** For information about the FILENAME statement, see “FILENAME Statement” in SAS Global Statements: Reference.

**libref.catalog**

specifies a SAS catalog to write to.

**See** For information about the LIBNAME statement, see “LIBNAME Statement” in SAS Global Statements: Reference.

**URL= ‘Uniform-Resource-Locator’ | NONE**

specifies a URL for the file-specification.

**Uniform-Resource-Locator**

is the URL that you specify. ODS uses this URL instead of the filename in all the links and references that it creates to the file.

**NONE**

specifies that no information from the PATH= option appears in the links or references.

**Tip** This option is useful for building output files that can be moved from one location to another. The links from the contents and page files must be constructed with a single-name URL, and the contents, page, and body files must be in the same location.

**Interaction** If you use the BODY= or FILE= external file option in conjunction with the PATH= option, the external file specification should not include path information.

**RECORD_SEPARATOR= ‘alternative-separator’ | NONE**

specifies an alternative character or string that separates lines in the output files.
Different operating environments use different separator characters. If you do not specify a record separator, then the files are formatted for the environment where you run the SAS program. However, if you are generating files for viewing in a different operating environment that uses a different separator character, then you can specify a record separator that is appropriate for the target environment.

**alternative-separator** represents one or more characters in hexadecimal or ASCII format. For example, the following option specifies a record separator for a carriage return character and a linefeed character for use with an ASCII file system:

```plaintext
RECORD_SEPARATOR= '0D0A'x
```

**Operating Environment Information:** In a mainframe environment, the following option specifies a record separator for a carriage return character and a linefeed character for use with an ASCII file system:

```plaintext
RECORD_SEPARATOR= '0D25'x
```

**Requirement** You must enclose alternative-separator in quotation marks.

**NONE** produces the markup language that is appropriate for the environment where you run the SAS job.

**Windows Specifics:** In a mainframe environment, by default, ODS produces a binary file that contains embedded record separator characters. This binary file is not restricted by the line-length restrictions on ASCII files. However, if you view the binary files in a text editor, then the lines run together. If you want to format the files so that you can read them with a text editor, then use RECORD_SEPARATOR= NONE. In this case, ODS writes one line of markup language at a time to the file. When you use a value of NONE, the logical record length of the file that you are writing to must be at least as long as the longest line that ODS produces. If the logical record length of the file is not long enough, then the markup language might wrap to another line at an inappropriate place.

**Aliases**

- RECSEP=
- RS=

**SGE=ON | YES | OFF | NO** generates a file that can be edited only with the ODS Graphics Editor. The file created has an extension of .sge.

**See** For details about using the ODS Graphics Editor to create SGE files, see *SAS ODS Graphics Editor: User’s Guide*.

**Example**

```plaintext
ods html5 sge=on;
proc sgplot data=sashelp.class;
scatter x=weight y=height;
run;
```

**STYLE= style-template** specifies the style template to use in writing the output files.

**style-template** describes how to display the presentation aspects (color, font face, font size, and so on) of your SAS output. A style template determines the overall
each style template consists of style elements.

**Interaction**

The STYLE= option is not valid when you are creating XML output.

**Note**

If you are using SAS Studio, you do not need to specify the STYLE= option. You can go to Preferences ➤ Results and change the style from the drop-down list for your selected destination.

**See**

For a complete discussion of style templates, see “TEMPLATE Procedure: Creating a Style Template” in SAS Output Delivery System: Procedures Guide.

**Interaction**

If you specify the STYLE= option in an ODS HTML5 statement and subsequently need PROC PRINT output to use new style templates in another ODS HTML5 statement, close the first statement before specifying the second statement.

**STYLESHEET= 'file-specification' <(suboptions)>**

opens a markup family destination and places the style information for markup output into an external file, or reads style sheet information from an existing file. These files remain open until you do one of the following:

- close the destination with either an ODS markup-family-destination CLOSE statement or ODS _ALL_ CLOSE statement.
- open the same destination with a second markup family statement. This closes the first file and opens the second file.

**file-specification**

specifies the file, fileref, or SAS catalog to write to.

**external-file**

is the name of an external output file.

**Requirement**

You must enclose external-file in quotation marks.

**fileref**

is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

**See**

For information about the FILENAME statement, see "FILENAME Statement" in SAS Global Statements: Reference.

**entry.markup**

specifies an entry in a SAS catalog to write to.

**Interaction**

If you specify an entry name, you must also specify a library and catalog. See the discussion of the PATH= option.

**suboptions**

specifies one or more suboptions in parentheses. Suboptions are instructions for writing the output files. Suboptions can be the following:
**DYNAMIC**

enables you to send output directly to a web server instead of writing it to a file.

See For complete documentation about the DYNAMIC suboption, see “(DYNAMIC)” on page 110.

**NO_BOTTOM_MATTER**

specifies that no ending markup language source code be added to the output file.

See For complete documentation about the NO_BOTTOM_MATTER suboption, see “(NO_BOTTOM_MATTER)” on page 110.

**NO_TOP_MATTER**

specifies that no beginning markup language source code be added to the top of the output file. For HTML 4.0, the NO_TOP_MATTER option removes the style sheet.

See For complete documentation about the NO_TOP_MATTER suboption, see “(NO_TOP_MATTER)” on page 111.

**TITLE='title-text'**

inserts into the metadata of a file the text string that you specify as the text to appear in the browser window title bar.

*title-text*

is the text in the metadata of a file that indicates the title.

See For complete documentation about the TITLE= suboption, see “(TITLE='title-text')” on page 111.

**URL= 'Uniform-Resource-Locator'**

specifies a URL for the file-specification. ODS uses this URL (instead of the filename) in all the links and references that it creates and that point to the file.

See For complete documentation about the URL= suboption, see “(URL= 'Uniform-Resource-Locator' )” on page 112.

**Note**

By default, if you do not specifically send the information to a separate file, then the style sheet information is included in the specified HTML file.

**Example**

“Including Multiple Cascading Style Sheets in One HTML Document” in *SAS Output Delivery System: User’s Guide*

**TEXT=text-string**

inserts text into your document by triggering the paragraph event and specifying a text string to be assigned to the VALUE event variable.

**Default**

By default the TEXT= option is used in a paragraph event.

See For information about events and event variables, see “TEMPLATE Procedure: Creating Markup Language Tagsets” in *SAS Output Delivery System: Procedures Guide*.
TRANTAB= 'translation-table'
speifies the translation table to use when transcoding a file for output.


Suboptions

(DYNAMIC)
enables you to send output directly to a web server instead of writing it to a file. This option sets the value of the CONTENTTYPE= style attribute. For more information, see CONTENTTYPE= in PROC TEMPLATE.

Default If you do not specify DYNAMIC, then ODS sets the value of HTMLCONTENTTYPE= for writing to a file.

Restriction If you specify the DYNAMIC suboption with one of the following options in the ODS HTML statement, then you must specify it for all of these options in that statement.

- BODY=
- CONTENTS=
- PAGE=
- FRAME=
- STYLESHEET=
- TAGSET=

Requirements You must enclose DYNAMIC in parentheses.

You must specify DYNAMIC next to the file-specification specified by the BODY=, CONTENTS=, PAGE=, FRAME=, or STYLESHEET= option, or next to the tagset-name specified by the TAGSET= option.

(NO_BOTTOM_MATTER)
specifies that no end-of-file source code be added to the output file.

Alias NOBOT

Requirements You must enclose NO_BOTTOM_MATTER in parentheses.

You must specify NO_BOTTOM_MATTER next to the file-specification specified by the BODY=, CONTENTS=, PAGE=, FRAME=, or STYLESHEET= option, or next to the tagset-name specified by the TAGSET= option.

If you append text to an external file, you must use a FILENAME statement with the appropriate option for the operating environment.

Interactions The NO_BOTTOM_MATTER suboption, in conjunction with the NO_TOP_MATTER suboption, makes it possible for you to add output to an existing file. You can then put your own markup language between output objects in the file.
When you are opening a file that ODS has previously written to, use the ANCHOR= option to specify a new base name for the anchors. This step prevents duplicate anchors.

**Tip**

If you want to leave a body file in a state that you can append to with ODS, then use NO_BOTTOM_MATTER with the file-specification BODY= option in any markup language statement.

**See**

The NO_TOP_MATTER suboption

**NO_TOP_MATTER**

specifies that no beginning-of-file source code be added to the top of the output file. For HTML 4.0, the NO_TOP_MATTER option removes the style sheet.

**Alias**

NOTOP

**Requirements**

You must enclose NO_TOP_MATTER in parentheses.

You must specify NO_TOP_MATTER next to the file-specification specified by the BODY=, CONTENTS=, PAGE=, FRAME=, or STYLESHEET= option, or next to the tagset-name specified by the TAGSET= option.

If you append text to an external file, you must use a FILENAME statement with the appropriate option for the operating environment.

**Interactions**

The NO_TOP_MATTER suboption, in conjunction with the NO_BOTTOM_MATTER suboption, makes it possible for you to add output to an existing file. You can then put your own markup language between output objects in the file.

When you are opening a file that ODS has previously written to, use the ANCHOR= option to specify a new base name for the anchors. This step prevents duplicate anchors.

**See**

The NO_BOTTOM_MATTER suboption and the ANCHOR= option

**TITLE=’title-text’**

inserts into the metadata of a file the text string that you specify as the text to appear in the browser window title bar.

**title-text**

is the text in the metadata of a file that indicates the title.

**Requirements**

You must enclose TITLE= in parentheses.

You must enclose title-text in quotation marks.

**Tip**

If you are creating a web page that uses frames, then it is the TITLE= specification for the frame file that appears in the browser window title bar.

**Example**

(URL= 'Uniform-Resource-Locator' )
specifies a URL for the file-specification. ODS uses this URL (instead of the filename) in all the links and references that it creates and that point to the file.

Requirements
You must enclose URL= 'Uniform-Resource-Locator' in parentheses.

You must enclose Uniform-Resource-Locator in quotation marks.

You must specify URL= 'Uniform-Resource-Locator' next to the file-specification specified by the BODY=, CONTENTS=, PAGE=, FRAME=, or STYLESHEET= option, or next to the tagset-name specified by the TAGSET= option.

Tips
This option is useful for building HTML files that can be moved from one location to another. The links from the contents and page files must be constructed with a single name URL, and the contents, page, and body files must all be in the same location.

You never need to specify this suboption with the FRAME= option because ODS files do not reference the frame file.

Example
“Including Multiple Cascading Style Sheets in One HTML Document” in SAS Output Delivery System: User’s Guide

(OPTION="ON" | OFF")
controls whether table of contents metadata is included in the ODS HTML5 body file.

"OFF"
specifies that no table of contents metadata is included in the ODS HTML5 body file. This suppresses the display of procedure titles. This is useful when creating headings with PROC ODSTEXT for accessibility.

Alias "NO"

ON
specifies that table of contents metadata is included in the ODS HTML5 body file.

Alias "YES"

Default "OFF"

Example "Example 2: Creating a Custom Table of Contents with Anchors” on page 116

Details
Accessibility with HTML5
In SAS Viya, the ODS HTML5 destination together with the Daisy style, provides the best accessibility of the ODS destinations because there are many tags and attributes that allow for compliance with W3C Web Content Accessibility Guidelines (WCAG), version 2.0. For complete information about creating accessible output with ODS, see Creating Accessible SAS® 9.4 Output Using ODS and ODS Graphics.
HTML and HTML5 Differences

The ODS HTML5 destination is new for SAS 9.4. There are differences between HTML and HTML5. Refer to the W3C document W3C HTML5 Differences.

HTML Output Defaults

You must use the ODS HTML5 statement if you want output that uses HTML 5.0. The SAS Windowing environment defaults to HTML4. SAS Studio defaults to HTML5. For information about using SAS Studio, see “SAS Studio and ODS” in SAS Output Delivery System: User’s Guide.

Starting in SAS 9.3, in the SAS Windowing environment with the Windows and UNIX operating systems, by default the LISTING destination is closed and the HTML destination is open. Starting in SAS 9.3, you do not have to submit an ODS HTML statement to generate HTML output, and you do not have to use the ODS HTML CLOSE statement to be able to view your output. However, to create LISTING output, you must either submit the ODS LISTING statement or enable the LISTING destination by other means. For more details, see “Working with Output Defaults” in SAS Output Delivery System: User’s Guide.

Note: HTML and HTML5 use the HTMLBlue style by default.

HTML5 and Scalable Vector Graphics (SVG)

The ODS HTML5 statement supports Scalable Vector Graphics (SVG). Scalable Vector Graphics is an XML language for describing two-dimensional vector graphics. SVG is the default file type for the HTML5 destination.

SAS can create SVG documents by using Universal Printers and SAS/GRAPH device drivers. Most often in SAS, the SVG Universal Printers and device drivers are used to create graphs. Graphs can be created by using ODS Graphics or SAS/GRAPH. The ODS HTML5 destination can be used to create SVG documents. PNG is the default Universal Printer and device driver for the ODS HTML5 destination in SAS Studio. SVG documents can be stand-alone files or integrated within an HTML5 file.

In order to view SVG documents, you need a viewer or browser that supports Scalable Vector Graphics. For more information, see “Browser Support for Viewing SVG Documents” in SAS Language Reference: Concepts.

To view an SVG document in an HTML file, you either create a link to the SVG document, embed the SVG document in the HTML file, or create an SVG graph that is integrated in the HTML. The default value for option SVG_MODE for the HTML5 destination is INLINE. In order to embed the SVG graph, you must specify

OPTIONS (SVG_MODE="EMBED")

in the ODS HTML5 statement. For more information, see “SVG Documents in HTML Files” in SAS Language Reference: Concepts.


For detailed information about the SVG standard, see the W3 documentation at W3 Scalable Vector Graphics (SVG) document.
HTML and Portable Network Graphics (PNG)

The ODS HTML statement supports Portable Network Graphics (PNG). When using SAS Studio, PNG is the default Universal Printer and device driver for the ODS HTML destination. Portable Network Graphics is a file format for image compression and was created to replace Graphics Interchange Format (GIF). The PNG image does not incur blurring after compression as may happen with a JPEG image. PNG is the default file type for the HTML destination when using SAS Studio. Most browsers and image editing programs support the PNG format.

The PNG format supports the Red, Green, Blue, Alpha (RGBA) color model. The Alpha channel provides 256 levels of transparency. GIF images only support completely transparent pixels in a graphic. GIF pixels cannot be partially opaque. A PNG graphic can be placed on any color background and maintain its edges and original appearance.

Graphs can be created by using ODS Graphics or, if installed, SAS/GRAPH. The ODS HTML destination can be used to create PNG documents. You can also specify PNG output with the device option in the GOPTIONS statement. Here are examples of each of these methods of requesting PNG output:

- ODS GRAPHICS statement
  ```
  ods graphics / outputfmt=png;
  ```
- ODS HTML statement
  ```
  ods html dev=png;
  ```
- GOPTIONS statement
  ```
  goptions device=png;
  ```

For detailed information about the PNG standard, see the W3 documentation at W3 Portable Network Graphics (PNG) document.

HTML5 Support of Embedded Audio and Video

In the third maintenance release of SAS 9.4, HTML5 supports audio and video. The Report Writing Interface (RWI) is used to accomplish this task. Media methods, AUDIO and VIDEO, generate either an audio tag or a video tag in the HTML5 code. The audio and video elements specify a standard way to embed a video file or an audio file in a web page. How this works depends on the browser that is used.

Information about the RWI methods and the HTML5 tags that support audio and video can be found in the following documentation.

- “AUDIO Method” in SAS Output Delivery System: Advanced Topics
- “VIDEO Method” in SAS Output Delivery System: Advanced Topics
- HTML5 Audio tag
- HTML5 Video tag
- “RWI Basics” in SAS Output Delivery System: Advanced Topics

Examples:

Example 1: ODS Graphics SVG Graph in an HTML5 File

Features: ODS HTML5 Statement
ODS GRAPHICS Statement
PROC SG PLOT

Details
To integrate an ODS Graphics SVG graph in an HTML file, you must use the HTML5 destination. For this example, option(SVG_MODE='INLINE') is not needed, but shows how to specify the option when needed.

Program

ods html close;
ods html5 options(svg_mode="inline");
ods graphics /outputfmt=svg;
proc sgplot data=sashelp.stocks
  (where=(date >= "01jan2000"d and stock = "IBM"));
  title "Stock Trend";
  series x=date y=close;
  series x=date y=low;
  series x=date y=high;
run;
ods html5 close; /* Not needed if using SAS Studio */
ods html;        /* Not needed if using SAS Studio */

Program Description

Close the HTML destination. Close the default HTML destination. The HTML5 destination is being used.

ods html close;

Open the HTML5 destination and make the SVG graph appear inline. Open the HTML5 destination. The SVG_MODE option instructs SAS to place the graph inline.

ods html5 options(svg_mode="inline");

Specify the SVG output format for ODS GRAPHICS. Use ODS GRAPHICS to generate an SVG file.

ods graphics /outputfmt=svg;

Use PROC SG PLOT to create a graph.

proc sgplot data=sashelp.stocks
  (where=(date >= "01jan2000"d and stock = "IBM"));
  title "Stock Trend";
  series x=date y=close;
  series x=date y=low;
  series x=date y=high;
run;
**Close the HTML5 destination.** The ODS HTML5 CLOSE statement closes the HTML5 destination and all the files that are associated with it. Open the HTML5 destination.

```sas
ods html5 close; /* Not needed if using SAS Studio */
ods html;       /* Not needed if using SAS Studio */
```

---

**HTML5 Output**

This output is created using the ODS HTML5 destination.

**Output 6.1 Integrating an ODS Graphics SVG Graph in an HTML5 File**

![Stock Trend Graph](image)

**Example 2: Creating a Custom Table of Contents with Anchors**

**Features:**
- ODS HTML5 Statement
- Options
  - ANCHOR=
  - CONTENTS=
- PROC PRINT
- PROC SORT

**Details**

Options can be added to the ODS HTML5 statement to help with accessibility. To generate a Table of Contents that includes links, specify options ANCHOR= and CONTENTS=. 
Program

data a;
  set sashelp.demographics (where=(region='AMR'));
  fmtpop = pop;
run;

proc sort;
  by pop;
run;

proc format;
  value population
    low - <1000000 = Small
    1000000 - <10000000 = Medium
    10000000 - <100000000 = Large
    100000000 - <1000000000 = Huge
  ;
run;

ods html5 (id=web) style=daisy path='file-path'
file='file-name'
  {title='Create Links to Output Tables'}
options(outline='no')
anchor='myreport';

proc odstext contents=''
  p "<h1>North and South American Countries by population</h1>"
  p "<h2><a href='#myreport1'>Small populations</a></h2>"
  p "<h2><a href='#myreport2'>Medium populations</a></h2>"
  p "<h2><a href='#myreport3'>Large populations</a></h2>"
  p "<h2><a href='#myreport4'>Huge populations</a></h2>"
run;

proc print data=a label;
  var name pop gni;
  id name;
  format fmtpop population.;
  by fmtpop;
run;

ods html5 close; /* Not needed if using SAS Studio */

Program Description

Create your data set.

data a;
  set sashelp.demographics (where=(region='AMR'));
  fmtpop = pop;
run;

Sort your data set.

proc sort;
  by pop;
run;

Format your data. Establish the format for your data.
proc format;
  value population
    low  - <1000000 = Small
    1000000 - <10000000 = Medium
    10000000 - <100000000 = Large
    100000000 - <1000000000 = Huge
  run;

Open the HTML5 destination. The ODS HTML5 destination statement sets the ODS environment. The STYLE= option specifies the style Daisy, which is recommended for accessible output. The (ID=WEB) option is required for use with SAS Studio only. The (TITLE=) suboption inserts into the metadata of a file the text string that you specify as the text to appear in the browser window title bar. It is recommended that you always specify (TITLE=) for accessible output. The OUTLINE=NO option specifies that no table of contents metadata is included in the ODS HTML5 body file. This enables procedure titles to be suppressed in SAS Studio. If you do not specify OUTLINE=NO, procedure titles will show up as headings in the HTML outline that is read by screen readers.

    ods html5 (id=web) style=daisy path='file-path'
      file='file-name'
        (title='Create Links to Output Tables')
      options(outline='no')
      anchor='myreport';

Create a Table of Contents with links. Four links are created that point to each table (#myreport1 through #myreport4). There are four links because the BY statement is used in PROC PRINT and the Fmtpop variable is formatted by the custom 'population' format, which has four values. The CONTENTS= option is set to null for PROC ODSTEXT so that there is not an extra item in the table of contents generated by SAS.

    proc odstext contents='';
      p "<h1>North and South American Countries by population</h1>";
      p "<h2><a href='#myreport1'>Small populations</a></h2>";
      p "<h2><a href='#myreport2'>Medium populations</a></h2>";
      p "<h2><a href='#myreport3'>Large populations</a></h2>";
      p "<h2><a href='#myreport4'>Huge populations</a></h2>";
    run;

Print the data set. The ID statement is used so that the country names will be formatted as row headers.

    proc print data=a label;
      var name pop gni;
      id name;
      format fmtpop population.;
      by fmtpop;
    run;

Close the HTML5 destination. The ODS HTML5 CLOSE statement closes the HTML5 destination and all the files that are associated with it.

    ods html5 close; /* Not needed if using SAS Studio */
**HTML5 Output**

This output is created using the ODS HTML5 destination. It creates more accessible output by adding anchors to the table of contents.

**Output 6.2  Adding Anchors to the Table of Contents for Better Accessibility**

---

**The SAS System**

North and South American Countries by population

- **Small populations**
- **Medium populations**
- **Large populations**
- **Huge populations**

---

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SAINT KITTS/NEVIS</td>
<td>SAINT KITTS/NEVIS</td>
<td>42,696</td>
<td>11,150</td>
</tr>
<tr>
<td>DOMINICA</td>
<td>DOMINICA</td>
<td>78,940</td>
<td>1,250</td>
</tr>
<tr>
<td>ANTIQUA &amp; BARBUDA</td>
<td>ANTIQUA &amp; BARBUDA</td>
<td>81,445</td>
<td>10,300</td>
</tr>
<tr>
<td>GRENADA</td>
<td>GRENADA</td>
<td>102,924</td>
<td>7,000</td>
</tr>
<tr>
<td>SAINT VINCENT/GRENADINES</td>
<td>SAINT VINCENT/GRENADINES</td>
<td>115,051</td>
<td>5,250</td>
</tr>
<tr>
<td>ST. LUCIA</td>
<td>ST. LUCIA</td>
<td>192,795</td>
<td>5,660</td>
</tr>
<tr>
<td>BARBADOS</td>
<td>BARBADOS</td>
<td>269,656</td>
<td>15,900</td>
</tr>
<tr>
<td>BELIZE</td>
<td>BELIZE</td>
<td>269,736</td>
<td>5,150</td>
</tr>
<tr>
<td>DOMINICA</td>
<td>DOMINICA</td>
<td>323,953</td>
<td>15,140</td>
</tr>
<tr>
<td>SURINAME</td>
<td>SURINAME</td>
<td>449,236</td>
<td>8,190</td>
</tr>
<tr>
<td>GUYANA</td>
<td>GUYANA</td>
<td>751,218</td>
<td>4,110</td>
</tr>
</tbody>
</table>

---

**The SAS System**

North and South American Countries by population

- **Small populations**
- **Medium populations**
- **Large populations**
- **Huge populations**

---

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRINIDAD AND TOBAGO</td>
<td>TRINIDAD AND TOBAGO</td>
<td>1,305,239</td>
<td>11,100</td>
</tr>
<tr>
<td>JAMAICA</td>
<td>JAMAICA</td>
<td>2,650,713</td>
<td>3,630</td>
</tr>
<tr>
<td>PANAMA</td>
<td>PANAMA</td>
<td>3,231,502</td>
<td>6,070</td>
</tr>
<tr>
<td>URUGUAY</td>
<td>URUGUAY</td>
<td>3,463,167</td>
<td>9,470</td>
</tr>
<tr>
<td>COSTA RICA</td>
<td>COSTA RICA</td>
<td>4,327,229</td>
<td>9,550</td>
</tr>
</tbody>
</table>

---

**ODS PDF Statement**

Opens, manages, or closes the PDF destination, which produces PDF output, a form of output that is read by Adobe Acrobat and other applications.

**Valid in:** Anywhere

**Category:** ODS: Third-Party Formatted

**Default:** The default style for PRINTER destinations is Pearl.

**Restriction:** PDF does not support double-byte Type1 fonts.

**Note:** You can add drill-down graphs in your PDF file. For detailed information about drill-down graphs and about writing graphs to a PDF file, refer to “Writing Your Graphs to a PDF File” in SAS/GRAPH: Reference.

**Tip:** If the orientation of a PDF document is changed after the PDF destination is opened and before the PDF destination is closed, any setting for margins is taken from the OPTIONS statement in place before the ODS PDF FILE= statement. If no OPTIONS statement is
used to explicitly set the margins, the margin settings are retrieved from the SAS registry.

Example: For an example about using PROC TEMPLATE to customize titles and footnotes in PDF output, see “Enhancing Titles and Footnotes in PDF Output” in SAS Output Delivery System: Procedures Guide.

Syntax

```ods pdf <id=identifier> <action>;```

```ods pdf <id=identifier> <options>;```

Summary of Optional Arguments

- **(<id>=identifier)**
  - Open multiple instances of the same destination at the same time

- **ACCESSIBLE**
  - Control whether non-visual metadata is added to the PDF file that enables the file to be accessed by assistive technology such as a screen reader

- **NOACCESSIBLE**
  - Control whether an identifier is added to the metadata of the PDF file, which confirms that the PDF produced by SAS meets the PDF Matterhorn Protocol

- **ANCHOR='anchor-name'**
  - Specify the root name for the anchor tag that identifies each output object in the current file

- **AUTHOR='author-text'**
  - Insert the text string that you specify as the author into the metadata of a file

- **BASE='base-text'**
  - Specify a string to use as the first part of all references that ODS creates in the file

- **BOOKMARKGEN**
  - Control the generation of bookmarks in PDF files

- **NOBOOKMARKGEN**
  - Specify whether to generate and display the list of bookmarks for PDF files

- **BOOKMARKLIST=HIDE | NONE | SHOW**
  - Specify how to measure the width of cells. Use to override the default value of BOX_SIZING for a destination

- **COLOR=FULL | GRAY | MONO | NO | YES**
  - Apply a specified color scheme to your output

- **COLUMNS=n**
  - Specify the number of columns to create on each page of output

- **COMPRESS=n**
Specify the compression of a PDF file. Compression reduces the size of the file.

**CONTENTS= NO | YES**
- Control the generation of a printable table of contents

**CSSSTYLE= 'file-specification'<(media-type-1<…media-type-10>)>**
- Specify a cascading style sheet to apply to your output

**DOM=“external-file”**
- Specify that the ODS document object model is written to the SAS log or to an external file

**DPI=**
- Specify the image resolution in dots per inch for output images

**EXCLUDE exclusion(s) | ALL | NONE**
- Exclude output objects from the destination

**FILE=’external-file’ | fileref**
- Specify the output file.

**GFOOTNOTE**

**NOGFOOTNOTE**
- Specify the location where footnotes are printed in the graphics output

**GTITLE**

**NOGTITLE**
- Control the location where titles are printed in the graphics output

**KEYWORDS=’keywords-text’**
- Insert a string of keywords into the output file's metadata

**NEWFILE= starting-point**
- Create a new file at the specified starting-point

**NOACCESSIBLE_IDENTIFIER**
- Add an identifier to the metadata of the PDF file confirming that the PDF produced by SAS meets the PDF Matterhorn Protocol

**NOTOC**
- Omit the table of contents (Bookmark list) that is produced by default when producing PDF output

**PACKAGE <package-name>**
- Specify that the output from the destination be added to an ODS package

**PDFNOTE**
- Control whether notes are added to a PDF file for items that are associated with the FLYOVER= style attribute

**PDFTOC=n**
- Control the level of the expansion of the table of contents in PDF documents

**SELECT selection(s) | ALL | NONE**
- Select output objects for the destination.

**SHOW**
- Write to the SAS log the current selection or exclusion list for the destination

**STARTPAGE=NEVER | NO | NOW | YES | BYGROUP**
- Control page breaks

**STYLE=style-template**
- Specify the style template to use in writing the PDF output

**SUBJECT=’subject-text’**
- Insert the text string that you specify as the subject in the metadata of a file
TEXT='text-string'
Insert text into your output

TITLE='title-text'
Insert the text string that you specify as the title in the metadata of a file

UNIFORM
For multi-page tables, provide uniformity from page to page within a single table

Without Arguments

In SAS Studio, the PDF destination is open by default. In SAS Studio, you must use the ODS PDF statement with at least one action or option. When you do this, it opens another instance of a PDF destination and creates PDF output as specified.

Actions

The following actions are available for the ODS PDF statement:

**EXCLUDE exclusion(s) | ALL | NONE**
excludes one or more output objects from the destination.

- **Default**: NONE
- **Restriction**: A destination must be open for this action to take effect.
- **See**: “ODS EXCLUDE Statement” in SAS Output Delivery System: Procedures Guide

**SELECT selection(s) | ALL | NONE**
selects output objects for the specified destination.

- **Default**: ALL
- **Restriction**: A destination must be open for this action to take effect.
- **See**: “ODS SELECT Statement” in SAS Output Delivery System: Procedures Guide

**SHOW**
writes the current selection list or exclusion list for the destination to the SAS log.

- **Restriction**: The destination must be open for this action to take effect.
- **Tip**: If the selection or exclusion list is the default list (SELECT ALL), then SHOW also writes the entire selection or exclusion list. For information about selection and exclusion lists, see “Selection and Exclusion Lists” in SAS Output Delivery System: User’s Guide.
- **See**: “ODS SHOW Statement” in SAS Output Delivery System: User’s Guide

Optional Arguments

**ANCHOR='anchor-name'**
specifies the root name for the anchor tag that identifies each output object in the current file.
Each output object must have an anchor tag for the bookmarks to reference. The references are automatically created by ODS. These references, point to the name of an anchor. Therefore, each anchor name in a file must be unique.

**anchor-name**

is the root name for the anchor tag that identifies each output object in the current file.

ODS creates unique anchor names by incrementing the name that you specify. For example, if you specify ANCHOR='PRINT', then ODS names the first anchor print. The second anchor is named print1; the third is named print2, and so on.

**Requirement** You must enclose *anchor-name* in quotation marks.

**Alias** NAMED_DEST= | BOOKMARK=

**Restriction** Use this option only with the ODS PDF statement.

**Tips**

You can change anchor names as often as you want by submitting the ANCHOR= option in a valid statement anywhere in your program. After you have specified an anchor name, it remains in effect until you specify a new one.

Specifying new anchor names at various points in your program is useful when you want to link to specific parts of your PRINTER output. Because you can control where the anchor name changes, you know in advance what the anchor name is at those points.

**ACCESSIBLE | NOACCESSIBLE**

controls whether non-visual metadata is added to the PDF file that enables the file to be accessed by assistive technology such as a screen reader. When metadata is added, the file is often called a *tagged PDF* and follows the PDF/Universal Accessibility (PDF/UA) format.

Turning on the accessible feature after non-accessible content has been produced will not generate an accessible document.

**ACCESSIBLE<ON | OFF>**

**ON**

adds non-visual metadata to the PDF file that enables the file to be accessed by assistive technology such as a screen reader.

**OFF**

does not add non-visual metadata to the PDF file that enables the file to be accessed by assistive technology such as a screen reader.

**NOACCESSIBLE**

does not add non-visual metadata to the PDF file that enables the file to be accessed by assistive technology such as a screen reader.

**Default** NOACCESSIBLE

**Interaction** When the ACCESSIBLE= option is enabled, the PDFTOC= option is set to 0. The table of contents is fully expanded.

**Tip** You can also use the ACCESSIBLEPDF system option to enable the ACCESSIBLE option in the ODS PDF destination by default.
ACCESSIBLE_IDENTIFIER | NOACCESSIBLE_IDENTIFIER
specifies whether an identifier is added to the metadata of the PDF file, which confirms that the PDF produced by SAS meets the PDF Matterhorn Protocol. If the identifier is included, then a note is written to the SAS log. Use the ODS PDF ACCESSIBLE option or the ACCESSIBLEPDF system option to create accessible PDF output. For information about the ACCESSIBLEPDF system option, see “ACCESSIBLEPDF System Option” in SAS System Options: Reference.

Accessibility note: Using the ACCESSIBLE_IDENTIFIER option does not produce an accessible document. You must manually check your PDF for accessibility. The ACCESSIBLE_IDENTIFIER option is a method for you to add confirmation of accessibility to your document.

Note: This feature applies to SAS 9.4M6 and to later releases.

ACCESSIBLE_IDENTIFIER<=ON | OFF>
specifies that an identifier is added to the metadata of the PDF file confirming that the PDF produced by SAS meets the PDF Matterhorn Protocol.

ON
specifies that an identifier is added to the metadata of the PDF file confirming that the PDF produced by SAS meets the PDF Matterhorn Protocol.

 Alias YES

OFF
specifies that no identifier is added to the metadata of the PDF file confirming that the PDF produced by SAS meets the PDF Matterhorn Protocol.

 Alias NO

 Default OFF

NOACCESSIBLE_IDENTIFIER
specifies that no identifier is added to the metadata of the PDF file confirming that the PDF produced by SAS meets the PDF Matterhorn Protocol.

 Default NOACCESSIBLE_IDENTIFIER

AUTHOR= ’author-text’
inserts the text string that you specify as the author into the metadata of a file.

 author-text
is the text in the metadata of an open file that indicates the author.

 Restrictions Use this option only with the ODS PDF statement.

 The AUTHOR= option takes effect only if specified at the opening of a file.

 Requirement You must enclose author-text in quotation marks.

BASE=’base-text’
specifies the text to use as the first part of all references that ODS creates in the output file.
**base-text**

is the text that ODS uses as the first part of all references that ODS creates in the file.

Consider this specification: In this case, ODS creates references that begin with the string `http://www.your-company.com/local-url/`. The appropriate *anchor-name* completes the link.

```plaintext
BASE='http://www.your-company.com/local-url/'
```

**Restriction**
Use this option only with the ODS PDF statement.

**Requirement**
You must enclose `base-text` in quotation marks.

**BOOKMARKLIST= HIDE | NONE | SHOW**

specifies whether to generate and display the list of bookmarks for PDF files.

**HIDE**

generates a list of bookmarks for your PDF file. The bookmarks are not automatically displayed when you open the PDF file.

**NONE**

specifies not to generate a list of bookmarks for your PDF files.

**Aliases**

NO | OFF

NOBOOKMARKLIST is an alias for BOOKMARKLIST=NONE | NO | OFF.

**SHOW**

generates a list of bookmarks for your PDF file. The bookmarks are automatically displayed when you open the PDF file.

**Aliases**

YES

ON

BOOKMARKLIST is an alias for BOOKMARKLIST=SHOW | YES | ON.

**Example**

“Example 2: Creating a Printable Table of Contents” on page 144

**Default**

SHOW

**Restrictions**
This option can be set only when you first open the destination.

This option has an effect only when creating PDF output.

**Interaction**

The NOTOC option specifies BOOKMARKLIST= OFF and CONTENTS= OFF.

**Note**

The generation of the bookmarks is not affected by the setting of this option. Bookmarks are generated by the BOOKMARKGEN= option.

**Example**

“Example 2: Creating a Printable Table of Contents” on page 144

**BOOKMARKGEN | NOBOOKMARKGEN | BOOKMARKGEN=YES | NO**

Control the generation of bookmarks in PDF files
controls the generation of bookmarks in PDF files.

**BOOKMARKGEN**

specifies to generate bookmarks in PDF files.

**BOOKMARKGEN=**

controls the generation of bookmarks in PDF files.

- **NO**
  
  specifies not to generate bookmarks in PDF files.
  
  
  **Alias**
  
  OFF

- **YES**
  
  specifies to generate bookmarks in PDF files.
  
  
  **Alias**
  
  ON

**NOBOOKMARKGEN**

specifies not to generate bookmarks in the PDF files.

**Default**

YES or BOOKMARKGEN

**Interaction**

If you set BOOKMARKGEN=NO, then the BOOKMARKLIST option is set to NO also.

**BOX_SIZING=(CONTENT_BOX | ORDER_BOX)**

specifies how to measure the width of cells. This option overrides the default value of BOX_SIZING for a destination. The default value is set at the time of installation.

BOX_SIZING is defined by the WC3 specification, the CSS3 Module. For more information, refer to the CSS3 Box Model specification at [http://www.w3.org/TR/2002/WD-css3-box-20021024/#box-sizing](http://www.w3.org/TR/2002/WD-css3-box-20021024/#box-sizing).

**COLOR=FULL | GRAY | MONO | NO | YES**

applies the specified color scheme to your output.

- **FULL**
  
  creates full color output for both text and graphics.

- **GRAY**
  
  creates gray scale output for both text and graphics.
  
  **Alias**
  
  GREY

- **MONO**
  
  creates monochromatic output for both text and graphics.
  
  **Alias**
  
  BW

- **NO**
  
  does not use all the color information that the style template provides. If you specify COLOR=NO, then the destination does this:
  
  - generates black and white output
  - creates all text and rules in black
  - sets the SAS/GRAPH device to produce SAS/GRAPH output in gray scale
ignores specifications for a background color from the style template except for the purposes of determining whether to print rules for the table

YES

uses all the color information that a style template provides, including background color. To print in color, you must also do the following:

- use a printer that is capable of printing in color.
- use the COLORPRINTING SAS system option. For information about the COLORPRINTING system option, see SAS System Options: Reference.

Default YES

Tip If you choose color output for a printer that does not support color, then your output might be difficult to read.

COLUMNS=n

specifies the number of columns to create on each page of output.

n
is the number columns per page.

Default 1

COMPRESS=n

controls the compression of a PDF file. Compression reduces the size of the file.

n
specifies the level of compression. The larger the number, the greater the compression. For example, n=0 is completely uncompressed, and n=9 is the maximum compression level.

Default 6

Range 0–9

Restrictions Use this option only with the ODS PDF statement and the ODS PRINTER statement with the PDF option specified.

The COMPRESS= option takes effect only if specified at the opening of a file.

Interactions The COMPRESS= option overrides the DEFLATION system option. First, the DEFLATION system option checked. Next, the ODS PDF statement COMPRESS= option is checked. If the COMPRESS= option is specified, that value is used regardless of the value specified for the DEFLATION system option. For more information, see the DEFLATION on page 52 option.

The COMPRESS= option overrides the UPRINTCOMPRESSION option. If COMPRESS= is specified, the UPRINTCOMPRESSION system option is then queried. If the system option is off, it is turned on for this one PDF statement and the PDF file is compressed. When compression is complete, the UPRINTCOMPRESSION system option is again enabled for all other files to use. For more information, see the UPRINTCOMPRESSION on page 79 system option.
CONTENTS= NO | YES
controls the generation of a printable table of contents.

NO
does not generate a printable table of contents.

Alias NOCONTENTS is an alias for CONTENTS=NO.

YES
generates a printable table of contents.

Alias CONTENTS is an alias for CONTENTS=YES.

Default NO

Example  “Example 2: Creating a Printable Table of Contents” on page 144

CSSSTYLE= 'file-specification'<(media-type-1<…media-type-10>)>
specifies a cascading style sheet to apply to your output.

file-specification
specifies a file, fileref, or URL that contains CSS code.

file-specification is one of the following:

"external-file"
is the name of the external file.

Requirement You must enclose external-file in quotation marks.

fileref
is a file reference that has been assigned to an external file. Use the
FILENAME statement to assign a fileref.

See For information about the FILENAME statement, see “FILENAME
Statement” in SAS Global Statements: Reference.

"URL"
is a URL to an external file.

Requirement You must enclose URL in quotation marks.

(media-type-1<.. media-type-10>)
specifies one or more media blocks that correspond to the type of media that
your output is rendered on. CSS uses media type blocks to specify how a
document is to be presented on different media: on the screen, on paper, with
a speech synthesizer, with a braille device, and so on.

The media block is added to your output in addition to the CSS code that is
not contained in any media blocks. By using the media-type suboption, in
addition to the general CSS code, you can import the section of a CSS file
intended only for a specific media type.

Default If no media-type is specified in your ODS statement, but you
do have media types specified in your CSS file, then ODS
uses the Screen media type.

Range You can specify up to ten different media types.

Requirements You must enclose media-type in parentheses.
You must specify *media-type* next to the *file-specification* specified by the CSSSTYLE= option.

**Tip**

If you specify multiple media types, all of the style information in all of the media types is applied to your output. However, if there is duplicate style information in different media blocks, then the styles from the last media block are used.

**Restriction**

The CSSSTYLE= option does not affect SAS/GRAPH output.

**Requirement**

CSS files must be written in the same type of CSS produced by the ODS HTML statement. To view the CSS code that ODS creates, you can do one of the following:

- specify the ODS TRACE DOM statement
- specify the DOM option

**Interaction**

If both the STYLE= option and the CSSSTYLE= option are specified in an ODS statement, the option specified last is the option that is used.

**See**

For complete documentation about ODS and Cascading Style Sheets, see *SAS Output Delivery System: Advanced Topics*.

**Example**

"Applying a CSS File to ODS Output" in *SAS Output Delivery System: User's Guide*

---

**DOM<="external-file">**

specifies that the ODS document object model is written to the SAS log or an external file.

*external-file*

is the name of an external output file.

**Requirement**

You must enclose *external-file* in quotation marks.

**See**

For complete documentation about the ODS document object model, see "Working with the ODS Document Object Model" in *SAS Output Delivery System: Advanced Topics*.

---

**DPI=**

specifies the image resolution for output files.

**Default**

150

**Restriction**

The DPI= option takes effect only if specified at the opening of a file.

**Note**

For best results use standard printer DPI values such as 300, 600, or 1200.

**CAUTION**

When the PDF contains an image and you are using high DPI= or DPI_IMAGE= values (values over 600), you might need to increase memory allocations. To increase memory, set the MEMSIZE= system option to 500 or higher. You can also decrease the DPI= value to ensure that you do not run out of memory.
FILE='external-file' | fileref
specifies the output file.

external-file
is the name of an external file.

Requirement You must enclose external-file in quotation marks.

fileref
is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

Restriction The FILE=fileref option cannot be used in conjunction with the NEWFILE= option.

See For information about the FILENAME statement, see SAS Global Statements: Reference.

Default If you do not specify an output file, then ODS writes to the file that is specified by the PRINTERPATH= system option. If the system option does not specify a file, then ODS writes to the default printer. For more information, see the PRINTER= option.

Interaction In an ODS printer family statement that refers to an open ODS PRINTER destination, the FILE= option forces ODS to close the destination and all files that are associated with it. ODS then opens a new instance of the destination. For more information, see “Opening and Closing the PRINTER Destination” in SAS Output Delivery System: User’s Guide.

See For information about the FILENAME statement, see SAS Global Statements: Reference.

GFOOTNOTE | NOGFOOTNOTE
controls the location of the footnotes that are defined by the graphics program that generates the Printer output.

GFOOTNOTE
includes all of the currently defined footnotes within the graphics output.

NOGFOOTNOTE
prevents all of the currently defined footnotes from appearing in the graphics file. Instead, they become part of the Printer file.

Default GFOOTNOTE

Restriction This option applies only to SAS programs that produce one or more device-based graphics, or graphics created by the SGPLOT procedure, the SGPANEL procedure, or the SGSCATTER procedure.

See For more information, see “Customizing Titles and Footnotes” in SAS Output Delivery System: Procedures Guide.

GTITLE | NOGTITLE
controls the location of the titles that are defined by the graphics program that generates the Printer output.
GTITLE
includes all of the currently defined titles within the graphics output.

NOGTITLE
prevents all of the currently defined titles from appearing in the graphics output. Instead, the titles become part of the Printer file.

Default GTITLE

Restriction This option applies only to SAS programs that produce one or more device-based graphics, or graphics created by the SGPLOT procedure, the SGPANEL procedure, or the SGSCATTER procedure.

See For more information, see “Customizing Titles and Footnotes” in SAS Output Delivery System: Procedures Guide.

(<ID=> identifier)
enables you to open multiple instances of the same destination at the same time. Each instance can have different options.

identifier can be numeric or can be a series of characters that begin with a letter or an underscore. Subsequent characters can include letters, underscores, and numerals.

Restriction If identifier is numeric, it must be a positive integer.

Requirement The ID= option must be specified immediately after the destination name.

KEYWORDS='keywords-text'
inserts a string of keywords into the output file's metadata. The keywords enable a document management system to do topic-based searches.

keywords-text is the string of keywords.

Restrictions Use this option only with the ODS PDF statement.

The KEYWORDS= option takes effect only if specified at the opening of a file.

Requirement You must enclose keywords-text in quotation marks.

NEWFILE= starting-point
creates a new file at the specified starting-point.

starting-point is the location in the output where you want to create a new file.

ODS automatically names new files by incrementing the name of the file. In the following example, ODS names the first file REPORT.PDF. Additional files are named REPORT1.PDF, REPORT2.PDF, and so on.

Example:
FILE= 'REPORT.PDF'

starting-point can be one of the following:
BYGROUP
starts a new file for the results of each BY group.

NONE
writes all output to the file that is currently open.

OUTPUT
starts a new file for each output object. For SAS/GRAPH this means that ODS creates a new file for each SAS/GRAPH output file that the program generates.

Alias TABLE

PAGE
starts a new file for each page of output. A page break occurs when a procedure explicitly starts a new page (not because the page size was exceeded) or when you start a new procedure.

PROC
starts a body file each time you start a new procedure.

Default NONE

Restrictions The NEWFILE= option cannot be used if you are sending output to a physical printer.

When using the NEWFILE= option with the ODS PDF or the ODS Printer statement, you must also use the FILE= option and, in SAS Studio, specify an explicit path.

Tips If you end the filename with a number, then ODS begins incrementing with that number. In the following example, ODS names the first file MAY5.PDF. Additional body files are named MAY6.PDF, MAY7.PDF, and so on.

Example:
FILE= 'MAY5.PDF'

NOACCESSIBLE_IDENTIFIER
adds an identifier to the metadata of the PDF file confirming that the PDF produced by SAS meets the PDF Matterhorn Protocol. If the identifier is included, then a note is written to the SAS log. Use the ODS PDF ACCESSIBLE option or the ACCESSIBLEPDF system option to create accessible PDF output. For information about the ACCESSIBLEPDF system option, see “ACCESSIBLEPDF System Option” in SAS System Options: Reference.

Accessibility note: Using the ACCESSIBLE_IDENTIFIER option does not produce an accessible document. You must manually check your PDF for accessibility. The ACCESSIBLE_IDENTIFIER option is a method for you to add confirmation of accessibility to your document.

Note: This feature applies to SAS 9.4M6 and to later releases.

NOTOC
specifies that ODS omit the table of contents (Bookmark list) that is produced by default when producing PDF output.
The NOTOC option specifies BOOKMARKLIST=OFF and CONTENTS=OFF.

Examples

“Example 5: Combining a Table and Image on the Same Page” on page 154

“Example 6: Adding Text That Imitates a System Title” on page 157

“Example 7: Toggling Page Breaks” on page 161

“Example 8: Suppressing a Page Break” on page 165

PACKAGE <package-name>

specifies that the output from the destination be added to a package.

package-name

specifies the name of a package that was created with the ODS PACKAGE statement. If no name is specified, then the output is added to the unnamed package that was opened last.


PDFNOTE

controls whether notes are added to a PDF file for items that are associated with the FLYOVER= style attribute.

PDFNOTE

adds notes to a PDF file for items that are associated with the FLYOVER= style attribute.

Default PDFNOTE

Restriction Use this option only with the ODS PDF statement.

PDFTOC=n

controls the level of the expansion of the table of contents in PDF documents.

n

specifies the level of expansion. For example, PDFTOC=0 results in a fully expanded table of contents. PDFTOC=2 results in a table of contents that is expanded to two levels.

Default 0

Interaction When the ACCESSIBLE= option is enabled, the PDFTOC= option is set to 0. The table of contents is fully expanded.

Tip The PDFTOC= can be set after the file has been opened, but only the last specification for a given file is used.

See “Example 1: Opening Multiple Instances of the Same Destination at the Same Time” on page 140

STARTPAGE=NEVER | NO | NOW | YES | BYGROUP

controls page breaks.

BYGROUP

specifies to insert page breaks after each BY group.
NEVER
specifies not to insert page breaks, even before graphics procedures.

CAUTION
Each graph normally requires an entire page. The default behavior forces a new page after a graphics procedure. STARTPAGE=NEVER turns off that behavior, so specifying STARTPAGE= NEVER might cause graphics to overprint.

NO
specifies that no new pages be inserted at the beginning of each procedure, or within certain procedures, even if new pages are requested by the procedure code. A new page begins only when a page is filled or when you specify STARTPAGE=NOW.

CAUTION
Each graph normally requires an entire page. The default behavior forces a new page after a graphics procedure, even if you use STARTPAGE=NO. STARTPAGE=NEVER turns off that behavior, so specifying STARTPAGE= NEVER might cause graphics to overprint.

Alias  OFF
Tip  When you specify STARTPAGE=NO, system titles and footnotes are still produced only at the top and bottom of each physical page, regardless of the setting of this option. Thus, some system titles and footnotes that you specify might not appear when this option is specified.
Examples
“Example 5: Combining a Table and Image on the Same Page” on page 154
“Example 6: Adding Text That Imitates a System Title” on page 157
“Example 7: Toggling Page Breaks” on page 161
“Example 8: Suppressing a Page Break” on page 165

NOW
forces the immediate insertion of a new page.

Tip  This option is useful primarily when the current value of the STARTPAGE= option is NO. Otherwise, each new procedure forces a new page automatically.
Example  “Example 7: Toggling Page Breaks” on page 161

YES
inserts a new page at the beginning of each procedure, and within certain procedures, as requested by the procedure code.

Alias  ON
Default  YES
**STYLE=style-template**  
specifies the style template to use in writing the printer output.

**Default**  
By default, this value is Pearl for the PDF destination.

**Note**  
If you are using SAS Studio, you do not need to specify the STYLE= option. You can go to Preferences ⇒ Results and change the style from the drop-down list for your selected destination.

**See**  
For a complete discussion of style templates, see “Working with Styles” in SAS Output Delivery System: Procedures Guide.

For instructions on making your own user-defined style templates, see “TEMPLATE Procedure: Creating a Style Template” in SAS Output Delivery System: Procedures Guide.

**Examples**  
“Example 6: Adding Text That Imitates a System Title” on page 157

“Example 1: Opening Multiple Instances of the Same Destination at the Same Time” on page 140 to see the STYLE= option used.

**SUBJECT=’subject-text’**  
inserts into the metadata of a file the text string that you specify as the subject.

**subject-text**  
is the text in the metadata of a file that indicates the subject.

**Restrictions**  
Use this option only with the ODS PDF statement.

The SUBJECT= option takes effect only if specified at the opening of a file.

**Requirement**  
You must enclose subject-text in quotation marks.

**TEXT=’text-string’**  
inserts a text string into your output.

**text-string**  
is the text that you want to insert into your output.

**Requirement**  
You must enclose text-string in quotation marks.

**Tip**  
If you are submitting more than one procedure step and you do not specify the STARTPAGE=NO option, each procedure forces a new page before the output. Therefore, any text that you specify with TEXT= is on the same page as the previous procedure.

**See**  
“Conditionally Excluding Output Objects and Sending Them to Different Output Destinations” in SAS Output Delivery System: Procedures Guide

**TITLE=’title-text’**  
inserts into the metadata of a file the text string that you specify as the title.

**title-text**  
is the text in the metadata of a file that indicates the title.

**Restrictions**  
Use this option only with the ODS PDF statement.
The TITLE= option takes effect only if specified at the opening of a file.

**Requirement**
You must enclose *title-text* in quotation marks.

**UNIFORM**
for multiple page tables, ensures uniformity from page to page within a single table. When the UNIFORM option is in effect, ODS reads the entire table first, so that it can determine the column widths that are necessary to accommodate all the data. These column widths are applied to all pages of a multiple page table.

**Default**
If you do not specify the UNIFORM option, then ODS prints a table one page at a time. This approach ensures that SAS does not run out of memory while processing very large tables. However, it can also mean that column widths vary from one page to the next.

**Note**
With BY-group processing, SAS writes the results of each BY group to a separate table, so the output might not be uniform across BY groups.

**Tip**
The UNIFORM option can cause SAS to run out of memory if you are printing a very large table. If this happens, then you can explicitly set the width of each of the columns in the table, and then print the table one page at a time. To do so, you must edit the table template that you use.

**Details**

**Overview of the PDF Statement**
The ODS PDF statement is part of the ODS printer family of statements. Statements in the printer family open the PDF or PRINTER destination, producing output that is suitable for a high-resolution printer. The ODS PRINTER statement is also a member of the ODS printer family of statements.

Starting with SAS 9.4M6, the method used to build and compress PDF files has been enhanced, resulting in smaller file sizes. This change impacts all PDF files including tagged PDF files.

**Opening and Closing the PDF Destination**
You can modify an open PDF destination with many ODS PDF options. However, the FILE= and SAS options perform the following actions on an open PDF destination:

- close the open destination referred to in the ODS PDF statement
- close any files associated with the open PDF destination
- open a new instance of the PDF destination

If you use one of these options, it is best if you explicitly close the destination yourself.

**Securing ODS-Generated PDF Files**
You can use the ODS PRINTER statement or the ODS PDF statement to generate PDF output. By default, PDF files are not password protected, so any user can view, and edit the PDF files without restrictions. However, you can use SAS system options to restrict or allow users’ ability to access, assemble, copy, or modify the
ODS PDF files. Other SAS system options control whether the user can fill in forms and set the print resolution.

Setting the security of a PDF file involves setting an encryption level and setting PDF document properties. You use the following SAS system options to secure and configure document properties for PDF files:

<table>
<thead>
<tr>
<th>Action</th>
<th>System Option</th>
<th>Document Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifies whether PDF documents can be edited</td>
<td>PDFACCESS</td>
<td>Editing the Document</td>
</tr>
<tr>
<td>Specifies whether PDF documents can be assembled</td>
<td>PDFASSEMBLY (p. 62)</td>
<td>Document Assembly</td>
</tr>
<tr>
<td>Specifies whether PDF document comments can be modified</td>
<td>PDFCOMMENT (p. 63)</td>
<td>Commenting</td>
</tr>
<tr>
<td>Specifies whether the contents of a PDF document can be changed</td>
<td>PDFCONTENT (p. 64)</td>
<td>Changing the Document</td>
</tr>
<tr>
<td>Specifies whether text and graphics from a PDF document can be copied</td>
<td>PDFCOPY (p. 65)</td>
<td>Content Copying</td>
</tr>
<tr>
<td>Specifies whether PDF forms can be filled in</td>
<td>PDFFILLIN (p. 67)</td>
<td>Form Field Fill-in or Signing</td>
</tr>
<tr>
<td>Specifies the password to use to open a PDF document and the password</td>
<td>PDFPASSWORD= (p. 70)</td>
<td>Security Method</td>
</tr>
<tr>
<td>used by a PDF document owner</td>
<td></td>
<td>Document Open Password</td>
</tr>
<tr>
<td>Specifies the resolution used to print the PDF document</td>
<td>PDFPRINT= (p. 72)</td>
<td>Printing</td>
</tr>
<tr>
<td>Specifies the level of encryption for PDF documents</td>
<td>PDFSECURITY= (p. 74)</td>
<td>Encryption Level</td>
</tr>
</tbody>
</table>

The PDF system options are documented in *SAS System Options: Reference*.

**Note:** The SAS/SECURE SSL software that is used to encrypt PDF files is included in the SAS installation software only for countries that allow the importation of encryption software.

You secure a PDF file by setting the PDFSECURITY= system option to an encryption level. Valid security levels for the PDFSECURITY= option are NONE or HIGH. SAS sets the default PDF document properties based on the encryption level.
PDFSECURITY=NONE sets no encryption level or document property restrictions for the document. All of the PDF document properties are set to Allowed. Setting other PDF system options has no effect on PDF document properties when PDFSECURITY=NONE.

PDFSECURITY=HIGH sets the encryption level to 128-bit RC4.

When the PDFSECURITY= option is set to HIGH, you must specify one or more document passwords using the PDFPASSWORD= option. Passwords are required to open a secure document. An optional permissions password can be required to validate the document owner. Use the OPEN= "pw" argument to specify a password to open a document. Use the OWNER="pw" argument to specify a permissions password for the document owner.

To view the document properties for a PDF file, open the PDF file, right-click in the document, select Document Properties from the menu, and click Show Details. The Document Security window appears with the document property values.

**Note:** The Security tab in the Document Properties window displays the security settings. When PDFSECURITY=NONE, the Show Details button is inactive and the Document Restrictions Summary section displays the document property value of Allowed for all properties. If PDFSECURITY= is set HIGH, ignore the Document Restrictions Summary section. The PDF document properties are displayed properly only from the Document Security window, which you access with the Show Details button.

The Yes and No values for the Document Open Password and the Permissions Password document properties indicate whether password security has been set for a document. These values are determined by the values of the PDFSECURITY= option and the PDFPASSWORD= option as shown in this table:

<table>
<thead>
<tr>
<th>Security Method</th>
<th>PDFSECURITY=HIGH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDFPASSWORD=</td>
<td></td>
</tr>
<tr>
<td>Document Open Password</td>
<td></td>
</tr>
<tr>
<td>OPEN=&quot;pw&quot;</td>
<td>Yes</td>
</tr>
<tr>
<td>OWNER=&quot;pw&quot;</td>
<td>No</td>
</tr>
<tr>
<td>OPEN=&quot;pw&quot; OWNER=&quot;pw&quot;</td>
<td>Yes</td>
</tr>
<tr>
<td>Permissions Password</td>
<td></td>
</tr>
<tr>
<td>OPEN=&quot;pw&quot;</td>
<td>No</td>
</tr>
<tr>
<td>OWNER=&quot;pw&quot;</td>
<td>Yes</td>
</tr>
<tr>
<td>OPEN=&quot;pw&quot; OWNER=&quot;pw&quot;</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Nearly all other document properties can be set to Allowed or Not Allowed by using other PDF system options. The Page Extraction property cannot be set by using a system option. To see how the individual options set the document properties, see the documentation for the PDF system options in *SAS System Options: Reference*.

The following table shows the default PDF document properties for the two values of the PDFSECURITY= option:
### Table 6.4 Default PDF Document Properties for PDFSECURITY= Option Values

<table>
<thead>
<tr>
<th>PDFSECURITY=NONE</th>
<th>PDFSECURITY=HIGH ¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Printing</td>
<td>Allowed</td>
</tr>
<tr>
<td>Changing the Document</td>
<td>Allowed</td>
</tr>
<tr>
<td>Commenting</td>
<td>Allowed</td>
</tr>
<tr>
<td>Form Field Fill-in or Signing</td>
<td>Allowed</td>
</tr>
<tr>
<td>Document Assembly</td>
<td>Allowed</td>
</tr>
<tr>
<td>Content Copying</td>
<td>Allowed</td>
</tr>
<tr>
<td>Content Accessibility Enabled</td>
<td>Allowed</td>
</tr>
<tr>
<td>Page Extraction</td>
<td>Allowed</td>
</tr>
<tr>
<td>Encryption Level</td>
<td>None</td>
</tr>
</tbody>
</table>

¹ Documents that are created when PDFSECURITY=HIGH can be viewed using Acrobat 5.0 and later.

Some document properties are set by SAS system options only when PDFSECURITY=HIGH.

### Importing Existing Images into a PDF File

Images can be included in PDF files created with SAS using the style attributes BACKGROUNDIMAGE, POSTIMAGE, and PREIMAGE. These can be included using PROC TEMPLATE or inline style syntax.

In order to get the best looking images included in your ODS PDF file, the images should follow these parameters:

- Images should be in one of the following formats: JPEG, PNG, GIF, BMP, TIFF.
- The image should have 150 dots per inch (DPI). It is important that all images have a consistent DPI. For example, if you have more than one image to include in your PDF file(s), they should all have the same DPI (150 for best results).
- The image DPI should match the PDF DPI.
- If you use JPG files, these should conform to the JFIF standard, use RGB colors, and should not use transparency in the image.
- It is recommended that you create the image in the height and width that is desired in the final report output. For example, if you need to display a banner image that is 2 inches by 6 inches in size, the file should be 150 DPI, use RGB colors, and have the dimensions of 2 inches by 6 inches. ODS PDF will then accurately include the image in the resulting PDF file.

### Working with the Table of Contents

The ODS PDF destination provides the following two navigation tools:
The default table of contents (TOC), which is a clickable bookmark tree that is not printed.

Output 6.3  PDF Output Default Bookmark Tree

A printable table of contents is generated using the CONTENTS=YES option on the ODS PDF FILE= statement. When viewing the PDF file on a computer, the table of contents is clickable. The page count of the PDF file is not affected by the table of contents. The text of each of the entries is customizable with the ODS PROCLABEL statement and CONTENTS= options on some of the PROC statements.

Output 6.4  PDF Output Default Table of Contents Page

The text displayed by the nodes of each tool is controlled with the following:

- the ODS PROCLABEL statement
- the CONTENTS=, the DESCRIPTION=, and the OBJECTLABEL= options
- the DOCUMENT destination and procedure
- the TEMPLATE procedure

Examples:

Example 1: Opening Multiple Instances of the Same Destination at the Same Time

Features: ODS PDF statement option:

- ID=
- STYLE=
- FILE=

PROC FORMAT
PROC SORT
PROC REPORT
NOBYLINE|BYLINE system option
#BYVAL parameter in titles

Details

This example opens multiple instances of the PDF destination to create PDF output. One instance uses the default style template and the second instance uses the STYLE= option to specify the Sapphire style template.

Program

```sas
proc sort data=grain_production;
   by year country type;
run;
ods HTML close; /* Not needed if using SAS Studio */ ???
options nobyline nodate;
title 'Leading Grain-Producing Countries';
title2 'for #byval(year)';
ods pdf file='grain-1.pdf' pdftoc=2;
ods pdf (id=SapphireStyle) style=Sapphire file='grain-2.pdf' pdftoc=3;
proc report data=grain_production nowindows;
   by year;
   column country type kilotons;
   define country / group width=14 format=$cntry.;
   define type / group 'Type of Grain';
   define kilotons / format=comma12.;
   footnote 'Measurements are in metric tons.';
run;
options byline;
title2;
proc tabulate data=grain_production format=comma12.;
   class year country type;
   var kilotons;
   table year,
      country*type,
         kilotons*sum=' ' / box=_page_ misstext='No data';
   format country $cntry.;
   footnote 'Measurements are in metric tons.';
run;
ods pdf close; /* Not needed if using SAS Studio */
ods pdf(id=Sapphirestyle) close;
ods html;
```

Program Description

Sort the data set Grain_Production. SORT sorts the data first by values of Year, then by values of Country, and finally by values of Type.

```sas
proc sort data=grain_production;
```
by year country type;
run;

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.

ods HTML close; /* Not needed if using SAS Studio */ ???

Suppress the default BY line, suppress the printing of the date, and use the BY value in a title. The NOBYLINE option suppresses the BY line. The #BYVAL specification inserts the current value of the BY variable Year into the title.

options nobyline nodate;
title 'Leading Grain-Producing Countries';
title2 'for #byval(year)';

Create two different PDF output files at the same time. The ODS PDF statement opens the PDF destination and creates PDF output. The file Grain-1.pdf is created by the first ODS PDF statement. Because no style template is specified, the default style, Styles.Pearl, is used. The PDFTOC=2 option specifies that the table of contents is expanded two levels. The file Grain-2.pdf is created by the second ODS PDF statement with the ID= option specified. The STYLE= option specifies that ODS use the style template Sapphire The ID= option gives this instance of the PDF destination the name SapphireStyle. The PDFTOC=3 option specifies that the table of contents is expanded three levels. If you do not specify the ID= option, this ODS PDF statement closes the instance of the PDF destination that was opened by the previous ODS PDF statement and opens a new instance of the PDF destination. The file Grain-1.pdf contains no output.

ods pdf file='grain-1.pdf' pdftoc=2;
ods pdf (id=SapphireStyle) style=Sapphire file='grain-2.pdf' pdftoc=3;

Produce a report. This PROC REPORT step produces a report on grain production. Each BY group produces a page of output.

proc report data=grain_production nowindows;
   by year;
   column country type kilotons;
   define country / group width=14 format=$cntry.;
   define type     / group 'Type of Grain';
   define kilotons / format=comma12.;
   footnote 'Measurements are in metric tons.';
run;

Restore the BY line and clear the second title statement. The BYLINE option restores the BY line. The TITLE2 statement clears the second TITLE statement.

options byline;
title2;

Produce a report that contains one table for each year. The TABLE statement in this PROC TABULATE step has Year as the page dimension. Therefore, PROC TABULATE explicitly produces one table for 1995 and one for 1996.

proc tabulate data=grain_production format=comma12.;
   class year country type;
   var kilotons;
   table year,
            country*type,
            kilotons*sum=' ' / box=_page_ misstext='No data';
format country $cntry.;
footnote 'Measurements are in metric tons.';
run;

Close the open destinations so that you can view or print the output. The ODS PDF CLOSE statement closes the first instance of the PDF destination and all of the files that are associated with it. The ODS PDF (ID=Sapphirestyle) statement closes the second instance of the PDF destination and all of the files that are associated with it. You must close the destinations before you can view the output with a browser or before you can send the output to a physical printer.

ods pdf close;    /* Not needed if using SAS Studio */
ods pdf(id=Sapphirestyle) close;

Open the HTML destination. The ODS HTML statement opens the HTML destination and returns SAS to the default ODS destination.

ods html;

PDF Output

The default style for the ODS PDF and ODS PRINTER statements is Pearl.

Output 6.5  PDF Output with the Default Style Applied

<table>
<thead>
<tr>
<th>Leading Grain-Producing Countries for 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td>Brazil</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>China</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>India</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>United States</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Leading Grain-Producing Countries
for 1995

<table>
<thead>
<tr>
<th>Country</th>
<th>Type of Grain</th>
<th>Kilotons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>Corn</td>
<td>36,276</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
<td>11,236</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>1,516</td>
</tr>
<tr>
<td>China</td>
<td>Corn</td>
<td>112,331</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
<td>185,226</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>102,207</td>
</tr>
<tr>
<td>India</td>
<td>Corn</td>
<td>9,800</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
<td>122,372</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>63,007</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Corn</td>
<td>8,223</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
<td>49,860</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>.</td>
</tr>
<tr>
<td>United States</td>
<td>Corn</td>
<td>187,300</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
<td>7,888</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>59,494</td>
</tr>
</tbody>
</table>

Example 2: Creating a Printable Table of Contents

Features:
ODS PDF statement option:
  BOOKMARKLIST=
  CONTENTS=
  FILE=
OPTIONS statement
PROC FREQ
PROC PRINT

Details
By default, ODS PDF does not create a printable table of contents, only a clickable bookmark tree. This example shows you how to create a printable table of contents.

Program

ods html close; /* Not needed if using SAS Studio */
title "Create a Table of Contents";
options nodate;
ods pdf file="MyDefaultToc.pdf" contents=yes bookmarklist=hide;

proc freq data=sashelp.cars;
  tables origin*type;
run;

proc print data=sashelp.cars;
run;

ods pdf close; /* Not needed if using SAS Studio */
ods html;

Program Description

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.

ods html close; /* Not needed if using SAS Studio */

Specify a title and set the SAS system options.

    title "Create a Table of Contents";
    options nodate;

Open the PDF destination and specify the ODS PDF statement options. The ODS PDF statement opens the PDF destination and the FILE= option specifies PDF filename. The CONTENTS=YES option specifies that a table of contents is created. Because you are creating a table of contents, you might not need the bookmark tree. The BOOKMARKLIST=HIDE option specifies that a bookmark tree is created but hidden.

    ods pdf file="MyDefaultToc.pdf" contents=yes bookmarklist=hide;

Create the procedure output.

    proc freq data=sashelp.cars;
      tables origin*type;
    run;

    proc print data=sashelp.cars;
    run;

Close the PDF destination and open the HTML destination. The ODS PDF close statement closes the PDF destination and all of the files that are associated with it. You must close the destinations before you can view the output with a browser or before you can send the output to a physical printer. The ODS HTML statement opens the HTML destination and returns SAS to the default ODS destination.

    ods pdf close; /* Not needed if using SAS Studio */
    ods html;
PDF Output

Output 6.7  Printable Table of Contents for PDF Output

<table>
<thead>
<tr>
<th>Table of Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Freq Procedure</td>
</tr>
<tr>
<td>Table Origin &amp; Type</td>
</tr>
<tr>
<td>Cross-Tabular Freq Table</td>
</tr>
<tr>
<td>The Print Procedure</td>
</tr>
<tr>
<td>Data Set SASHELP.CARS</td>
</tr>
</tbody>
</table>

Example 3: Customizing the Table of Contents

Features:
- ODS PDF statement option
  - FILE=
  - STYLE=
- PROC TEMPLATE options:
  - DEFINE statement
  - PARENT= statement
  - CLASS statement
  - PRETEXT= style attribute
  - ContentTitle style element
- ODS PROCLABEL
- ODS HTML
- OPTIONS statement
- PROC FREQ
- PROC PRINT

Details
This example shows you how to customize the table of contents with the following tasks:

- PROC TEMPLATE is used to change the table of contents title text.
- ODS PROCLABEL is used to change the first-level node text for the PROC FREQ and PROC PRINT output.
- The CONTENTS= option is used in the TABLES statement in PROC FREQ to eliminate the second node of text for the PROC FREQ crosstab table.
- The CONTENTS= option is used in the PROC PRINT statement to change the text of the second node created by the PROC PRINT table.

This example requires some knowledge of style templates, style elements, and style attributes.

- For complete documentation about styles, see “Understanding Styles, Style Elements, and Style Attributes” in SAS Output Delivery System: Procedures Guide.
- For a table of style attributes, see “Style Attributes Tables” in SAS Output Delivery System: Advanced Topics.
For a table of style elements affecting pages, see “Style Elements Affecting Pages” in *SAS Output Delivery System: Advanced Topics*.

For a table of style elements affecting the table of contents, see “Style Elements Affecting Tables of Contents” in *SAS Output Delivery System: Advanced Topics*.

### Program

```sas
ods html close;  /* Not needed if using SAS Studio */
proc template;
  define style Styles.CustomTitle;
  parent=Styles.pearl;
    class ContentTitle from ContentTitle /
      pretext='My Customized Title';
  end;
run;

title "Create a Custom Table of Contents";
options nodate;

ods pdf file="CustomTOC.pdf" style=Styles.CustomTitle;
ods proclabel "Crosstab of SASHELP.CARS";
proc freq data=sashelp.cars;
  tables origin*type / contents="";
run;
ods proclabel "All variables: SASHELP.CARS";
proc print data=sashelp.cars contents="Second level";
run;

ods pdf close;  /* Not needed if using SAS Studio */
ods html;
proc template;
delete Styles.CustomTitle;
run;
```

### Program Description

**Close the HTML destination so that no HTML output is produced.** The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.

```sas
ods html close;  /* Not needed if using SAS Studio */
```

**Create a style to change the table of contents title text.** The first step in using PROC TEMPLATE to modify the title text is to create a new style. The DEFINE STYLE statement in PROC TEMPLATE specifies that CustomTitle is the name of the new style, and that it is stored in the Styles item store. The PARENT= statement specifies that all style elements and attributes are inherited from the style Styles.Pearl, which is the PDF default style.

```sas
proc template;
```
define style Styles.CustomTitle;
parent=Styles.pearl;

Specify the text for the custom title. The ContentTitle style element controls the appearance of the contents title. The CLASS statement specifies that the style element ContentTitle is going to be modified. The PRETEXT= style attribute specifies the new text for the table of contents title.

    class ContentTitle from ContentTitle /
        pretext='My Customized Title';
    end;
run;

Specify a title and set the SAS system options.

title "Create a Custom Table of Contents";
options nodate;

Open the PDF destination and specify the ODS PDF statement options. The ODS PDF statement opens the PDF destination and the FILE= option specifies PDF filename. The STYLE= option specifies that the custom style Styles.CustomTitle is applied to the output.

    ods pdf file="CustomTOC.pdf" style=Styles.CustomTitle;

For PROC FREQ, change the text for the first-level node and suppress the second-level node. The ODS PROCLABEL statement specifies that the text "Crosstab of SASHELP.CARS" overrides the default procedure label, which is used as the first-level node. The PROC FREQ option CONTENTS=" " suppresses the text for the second-level node.

    ods proclabel "Crosstab of SASHELP.CARS";
    proc freq data=sashelp.cars;
        tables origin*type / contents="";
    run;

For PROC PRINT, change the text for both the first-level node and the second-level node. The ODS PROCLABEL statement specifies that the text "All variables: SASHELP.CARS" overrides the default procedure label, which is used as the first-level node. The PROC PRINT option CONTENTS= specifies custom text for the second-level node.

    ods proclabel "All variables: SASHELP.CARS";
    proc print data=sashelp.cars contents="Second level";
    run;

Close the PDF destination and open the HTML destination. The ODS PDF CLOSE statement closes the PDF destination and all of the files that are associated with it. You must close the destinations before you can view the output with a browser or before you can send the output to a physical printer. The ODS HTML statement opens the HTML destination and returns SAS to the default ODS destination.

    ods pdf close;   /* Not needed if using SAS Studio */
    ods html;

After your output is produced, you can remove the custom style. If you no long want to keep the new style, you can use the DELETE statement in PROC TEMPLATE to remove the custom style.

    proc template;
Example 4: Customizing BY Lines

Features:
- ODS PDF statement option
  FILE=
- ODS HTML
- ODS LISTING statement
- ODS OUTPUT statement
- PROC DOCUMENT
- OPTIONS statement
- PROC PRINT
- PROC SORT
- PROC TABULATE
- DATA step
- MACRO language

Details
The use of BY variables sometimes results in more text than is desired in the tables of contents. The following example shows the use of ODS, PROC DOCUMENT, and the MACRO language to do the following:
Step 1: Create an ODS Document

```sas
ods html close;
ods pdf file="DefaultTOC.pdf";
proc sort data=sashelp.cars out=cars;
   by origin;
run;
ods document name=Reorder (write);
proc tabulate data=cars;
   title "#byval1";
   by origin;
   class cylinders;
   var mpg_highway;
   table cylinders, mpg_highway*mean;
run;
ods _all_ close;
```

Program Description

The first step is to create an ODS document to store your PROC TABULATE output. You only have to create the procedure output one time and save it in an ODS document. This document, named Reorder, is used to manipulate the output from this point on.

**Close the HTML destination and open the PDF destination.** The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output. The ODS PDF statement opens the PDF destination and names the file the PDF output is written to.

```sas
ods html close;
ods pdf file="DefaultTOC.pdf";
```

**Sort the data set Sashelp.Cars by the variable ORIGIN**

```sas
proc sort data=sashelp.cars out=cars;
   by origin;
run;
```

**Create the ODS document Reorder.** The ODS DOCUMENT statement opens the DOCUMENT destination and specifies the name of a new document, Reorder. Reorder contains the PROC TABULATE output objects. This example uses Reorder in the new step to manipulate the TOC entries using PROC DOCUMENT.

```sas
ods document name=Reorder (write);
```
Create the **TABULATE** procedure output.

```
proc tabulate data=cars;
  title "#byval1";
  by origin;
  class cylinders;
  var mpg_highway;
  table cylinders, mpg_highway*mean;
run;
```

Close all open destinations.

```
ods _all_ close;
```

The following output shows the Bookmark list in the PDF file. The same text will show in the printable table of contents, if CONTENTS=YES is specified.

**Output 6.10  Default Table of Contents**

---

**Step 2: Create a DATA Set**

```
ods output properties=Props;
proc document name=reorder;
  list / levels=all;
run;
quit;

ods listing;
proc print data=props;
run;
ods listing close;
```

**Program Description**

Next, move the contents of the Reorder document into a DATA set. This enables you to automate the logic in step 3.
Create the Props data set. The ODS OUTPUT statement creates a data set name Props.

```sas
ods output properties=Props;
```

List the contents of the REORDER document and save them into the Props data set. The PROC DOCUMENT statement opens the document Reorder. The LIST statement lists the contents of Reorder. The contents are saved in the data set Props.

```sas
proc document name=reorder;
list / levels=all;
run;
quit;
```

Print the Props data set to see the document level names. At this point you might want to look at the contents of the Props data set. You can use the PROC PRINT and ODS LISTING statement to view the document level names.

```sas
ods listing;
proc print data=props;
run;
ods listing close;
```

Notice that some of the levels are directories (Dir) and some are tables (Table).

**Output 6.11  Document Level Names in LISTING Output**

<table>
<thead>
<tr>
<th>Obs</th>
<th>Path</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>\Tabulate#1</td>
<td>Dir</td>
</tr>
<tr>
<td>2</td>
<td>\Tabulate#1\ByGroup1#1</td>
<td>Dir</td>
</tr>
<tr>
<td>3</td>
<td>\Tabulate#1\ByGroup1#1\Report#1</td>
<td>Dir</td>
</tr>
<tr>
<td>4</td>
<td>\Tabulate#1\ByGroup1#1\Report#1\Table#1</td>
<td>Table</td>
</tr>
<tr>
<td>5</td>
<td>\Tabulate#1\ByGroup2#1</td>
<td>Dir</td>
</tr>
<tr>
<td>6</td>
<td>\Tabulate#1\ByGroup2#1\Report#1</td>
<td>Dir</td>
</tr>
<tr>
<td>7</td>
<td>\Tabulate#1\ByGroup2#1\Report#1\Table#1</td>
<td>Table</td>
</tr>
<tr>
<td>8</td>
<td>\Tabulate#1\ByGroup3#1</td>
<td>Dir</td>
</tr>
<tr>
<td>9</td>
<td>\Tabulate#1\ByGroup3#1\Report#1</td>
<td>Dir</td>
</tr>
<tr>
<td>10</td>
<td>\Tabulate#1\ByGroup3#1\Report#1\Table#1</td>
<td>Table</td>
</tr>
</tbody>
</table>

Step 3: Customize the Table of Contents

```sas
data _null_;  
set props end=last;  
if type in("Table") then do;  
count+1;  
call symputx('pathi'|trim(left(count)),pathi);  
end;  
call symput('total',count);  
run;

%macro order;  
proc document name=work.reorder;  
%do i=1 %to &total;  
setlabel &pathi+1 "#byval1";  
move &pathi+1 to ^;
```
Program Description

Now you can start modifying your table of contents. PROC DOCUMENT syntax changes the text and structure of the table of contents. The macro language enables you to automate the process.

**Place the table entries into macro variables.** This DATA step selects only the entries labeled Table. It then places path values into the macro variables PathtN and Total. These macro variables are used in a later %DO loop with macro logic.

```sas
data _null_; set props end=last; if type in('Table') then do; count+1; call symputx('patht'||trim(left(count)),path); end; call symputx('total',count); run;
```

**Reorder and rename the table of contents, and begin the macro definition.** The %MACRO statement creates the macro definition name Order. The MOVE statement moves the contents of the variable Path to the current working directory. This creates one node for each table in the table of contents. The SETLABEL statement renames the node entries to the name of the By variable.

```sas
%macro order; proc document name=work.reorder; %do i=1 %to &total; setlabel &&patht&i "#byval1"; move &&patht&i to ^; %end;
```

**Replay the output to the ODS PDF destination.** Create the PDF output by replaying the output to the PDF destination.

```sas
ods pdf file="replayed.pdf"; replay ; run; ods pdf close;
```
Show the modified document entries in the LISTING destination and end the macro definition. You can view all of the modified entries using the LIST statement and the ODS LISTING destination. The %MEND statement ends the macro definition.

```sas
ods listing;
    list / levels=all;
run;
ods listing close;
quit;
%mend;
```

Invoke the macro %ORDER. Now that your program is stored in a macro, invoke the macro %ORDER in order to create the output.

```sas
%order
```

**Output 6.12  Customized BY Line in PDF Output**

**Output 6.13  Modified Document Entries**

<table>
<thead>
<tr>
<th>Obs</th>
<th>Template</th>
<th>Label</th>
<th>Page</th>
<th>Break</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>The Tabulate Procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Origin=Asia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Cross-tabular summary report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Origin=Europe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Cross-tabular summary report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Origin=USA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Cross-tabular summary report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Bywall</td>
<td>Before</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Bywall</td>
<td>Before</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Bywall</td>
<td>Before</td>
<td></td>
</tr>
</tbody>
</table>

**Example 5: Combining a Table and Image on the Same Page**

**Features:**
- ODS PDF statement option
  - FILE=
  - NOTOC
  - STARTPAGE=NO
ODS NOPROCTITLE statement

ODS HTML

OPTIONS statement

PROC MEANS

PROC SGPLOT

Details

ODS PDF will paginate according to the individual procedures' behavior. For example, PROC PRINT will generate a new page break for every BY group if the PAGEBY statement is used. PROC REPORT will generate a new page break for every BY group if a BY statement is used; it will also generate a new page if a BREAK statement (after or before) includes the PAGE option. SAS/GRAPH and ODS GRAPHICs procedures will place one image on a page then produce a page break. To override this behavior, the STARTPAGE= option is available in the ODS PDF statement.

Program

```sas
ods html close; /* Not needed if using SAS Studio */
title "Eliminating Page Breaks";
options nodate;
ods pdf file="file.pdf" notoc startpage=no nogtitle;
ods noproctitle;
proc means data=sashelp.cars;
   class cylinders;
   var mpg_city mpg_highway;
run;
ods graphics / reset noborder width=6in;
proc sgplot data=sashelp.cars;
   scatter x=cylinders y=mpg_highway;
   scatter x=cylinders y=mpg_city;
   yaxis label="";
   keylegend / noborder;
run;
ods pdf close; /* Not needed if using SAS Studio */
ods html;
```

Program Description

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.

ods html close; /* Not needed if using SAS Studio */

Specify a title and set the SAS system options.
Open the PDF destination and specify the ODS PDF statement options. The ODS PDF statement opens the PDF destination and the FILE= option specifies the PDF filename. The NOTOC option specifies that no table of contents is created. The STARTPAGE=NO option specifies that no new pages are inserted at the beginning of each procedure, or within certain procedures, even if new pages are requested by the procedure code. The NOGTITLE option specifies that the title is not inserted into the graphic image. The ODS NOPROCTITLE statement suppresses the writing of the procedure title that produces the results.

```sas
ods pdf file="file.pdf" notoc startpage=no nogtitle;
ods noproctitle;
```

Create the MEANS procedure output.

```sas
proc means data=sashelp.cars;
   class cylinders;
   var mpg_city mpg_highway;
run;
```

Create a scatter plot with ODS graphics.

```sas
ods graphics / reset noborder width=6in;
proc sgplot data=sashelp.cars;
   scatter x=cylinders y=mpg_highway;
   scatter x=cylinders y=mpg_city;
   yaxis label=" ";
   keylegend / noborder;
run;
```

Close the PDF destination and open the HTML destination. The ODS PDF CLOSE statement closes the PDF destination and all of the files that are associated with it. You must close the destinations before you can view the output with a browser or before you can send the output to a physical printer. The ODS HTML statement opens the HTML destination and returns SAS to the default ODS destination.

```sas
ods pdf close; /* Not needed if using SAS Studio */
ods html;
```
PDF Output

Output 6.14  PDF Output with No Page Breaks

Example 6: Adding Text That Imitates a System Title

Features:
- ODS PDF statement option
  - FILE=
  - NOTOC
  - STARTPAGE=NO

Eliminating Page Breaks

<table>
<thead>
<tr>
<th>Cylinders</th>
<th>N</th>
<th>Variable</th>
<th>Label</th>
<th>N</th>
<th>Mean</th>
<th>Std Dev</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>1</td>
<td>60.00000000</td>
<td>.</td>
<td>60.00000000</td>
<td>60.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>1</td>
<td>66.00000000</td>
<td>.</td>
<td>66.00000000</td>
<td>66.00000000</td>
</tr>
<tr>
<td>4</td>
<td>136</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>136</td>
<td>24.84117653</td>
<td>5.2093430</td>
<td>18.00000000</td>
<td>59.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>136</td>
<td>31.86970593</td>
<td>4.6544333</td>
<td>23.00000000</td>
<td>51.00000000</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>7</td>
<td>19.85714297</td>
<td>0.8997354</td>
<td>18.00000000</td>
<td>21.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>7</td>
<td>26.85714297</td>
<td>1.0690450</td>
<td>25.00000000</td>
<td>28.00000000</td>
</tr>
<tr>
<td>6</td>
<td>190</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>190</td>
<td>18.51579859</td>
<td>1.7630130</td>
<td>14.00000000</td>
<td>23.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>190</td>
<td>25.55263195</td>
<td>3.1697760</td>
<td>17.00000000</td>
<td>32.00000000</td>
</tr>
<tr>
<td>8</td>
<td>87</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>87</td>
<td>15.87356332</td>
<td>1.8912585</td>
<td>10.00000000</td>
<td>18.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>87</td>
<td>21.86502575</td>
<td>3.5771789</td>
<td>12.00000000</td>
<td>28.00000000</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>2</td>
<td>11.00000000</td>
<td>1.4142136</td>
<td>10.00000000</td>
<td>12.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>2</td>
<td>16.50000000</td>
<td>4.9487475</td>
<td>13.00000000</td>
<td>20.00000000</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>MPG_City</td>
<td>MPG (City)</td>
<td>3</td>
<td>12.66666667</td>
<td>0.5773503</td>
<td>12.00000000</td>
<td>13.00000000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MPG_Highway</td>
<td>MPG (Highway)</td>
<td>3</td>
<td>19.00000000</td>
<td>0</td>
<td>15.00000000</td>
<td>18.00000000</td>
</tr>
</tbody>
</table>

Example 6: Adding Text That Imitates a System Title
Details

SAS titles and footnotes are displayed once per page in the PDF destination. Therefore, when the STARTPAGE= option is set to NO (OFF) and output from more than one procedure or DATA _NULL_ step is routed to ODS PDF, only the first set of titles and footnotes are written to the output file. This example shows how to use the TEXT= option to mimic an interim title, displayed above the second procedure output. PROC TEMPLATE is used to create a custom style template that mimics the style of the Systemtitle element. Systemtitle is the style element that controls the appearance of titles.

This example requires some knowledge of style templates, style elements, and style attributes.

- For complete documentation about styles, see “Understanding Styles, Style Elements, and Style Attributes” in SAS Output Delivery System: Procedures Guide.
- For a table of style attributes, see “Style Attributes Tables” in SAS Output Delivery System: Advanced Topics.
- For a table of style elements affecting pages, see “Style Elements Affecting Pages” in SAS Output Delivery System: Advanced Topics.
- For a table of style elements affecting the table of contents, see “Style Elements Affecting Tables of Contents” in SAS Output Delivery System: Advanced Topics.

Program

```sas
ods html close;
options nodate;

proc template;
   define style styles.mimictitle;
   parent=styles.pearl;
   class usertext from systemtitle /
      just=c;
   end;
run;

ods pdf file="file.pdf" notoc startpage=no style=styles.mimictitle;
```
title "Overriding the Default Procedure Title";
ods noproctitle;
proc means data=sashelp.cars;
   class cylinders;
   var mpg_city mpg_highway;
run;

ods text="My Custom PROC PRINT Output Title";
proc print data=sashelp.cars noobs;
   where mpg_highway gt 45;
run;

ods pdf close;
ods html;
proc template;
delete Styles.Mimictitle;
run;

Program Description

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.

ods html close;

Set the SAS system options.

options nodate;

Create a custom style template. The Usertext style element controls the appearance of user text, which includes text specified by the TEXT= option. The Systemtitle style element controls the appearance of the default SAS titles, which include the text specified by the TITLE= statement. This PROC TEMPLATE step creates a new style named Styles.Mimictitle, which contains all of the style elements and style attributes that Styles.Pearl contains. However, the CLASS statement modifies the Usertext style element to produce center-justified text, just as the Systemtitle style element does. This ensures that text specified by the TEXT= option will look the same as the text specified by the TITLE= statement.

proc template;
   define style styles.mimictitle;
      parent=styles.pearl;
      class usertext from systemtitle /
         just=c;
   end;
run;

Open the PDF destination and specify the ODS PDF statement options. The ODS PDF statement opens the PDF destination and the FILE= option specifies the PDF filename. The NOTOC option specifies that no table of contents is created. The STARTPAGE=NO option specifies that no new pages are inserted at the beginning
of each procedure, or within certain procedures, even if new pages are requested by
the procedure code. The STYLE= option specifies the style to use for the output,
which is Styles.Mimictitle in this example.

```sas
ods pdf file="file.pdf" notoc startpage=no style=styles.mimictitle;
```

**Specify a title.**

```sas
title "Overriding the Default Procedure Title";
```

**Create the MEANS procedure output and suppress the procedure title.** The
ODS NOPROCTITLE statement suppresses the writing of the procedure title that
produces the results.

```sas
ods noproctitle;
proc means data=sashelp.cars;
   class cylinders;
   var mpg_city mpg_highway;
run;
```

**Specify the text to use as the second procedure title.** The TEXT= option
specifies the text that appears above the PRINT procedure output. Because the
custom style Styles.Mimictitle was specified in the ODS PDF statement, this text will
look like a title specified by the TITLE= statement.

```sas
ods text="My Custom PROC PRINT Output Title";
```

**Create the PRINT procedure output.**

```sas
proc print data=sashelp.cars noobs;
   where mpg_highway gt 45;
run;
```

**Close the PDF destination and open the HTML destination.** The ODS PDF
CLOSE statement closes the PDF destination and all of the files that are associated
with it. You must close the destinations before you can view the output with a
browser or before you can send the output to a physical printer. The ODS HTML
statement opens the HTML destination and returns SAS to the default ODS
destination.

```sas
ods pdf close;
ods html;
```

**After your output is produced, you can remove the custom style.** The DELETE
statement in PROC TEMPLATE removes the custom style.

```sas
proc template;
delete Styles.Mimictitle;
run;
```

---

**PDF Output**

The following image shows the text “My Custom PROC PRINT Output Title” above
the PROC PRINT table in the same style as the title.
Example 7: Toggling Page Breaks

Features:
- ODS PDF statement option
  - FILE=
  - NOTOC
  - STARTPAGE=NO
  - STARTPAGE=NOW
- ODS GRAPHICS statement
- ODS HTML
- FOOTNOTE statement
- OPTIONS statement
- PROC REPORT
- PROC SGPLOT
- TITLE statement

Details

After pagination is turned off with STARTPAGE=NO, the setting stays in effect until it is overridden. If pagination is needed immediately and only once, the STARTPAGE=NOW setting is helpful. In the following example, PROC REPORT and PROC SGPLOT results are grouped onto two separate pages. The first REPORT table and SGPLOT image are on one page, and the second REPORT table and SGPLOT image are placed each on the next page. Each page has a different title and footnote.
Program

ods html close; /* Not needed if using SAS Studio */
options nodate;
ods pdf file="file.pdf" notoc startpage=no ;

title "Top of the First Page Title";
footnote "Bottom of the first page footnote";

proc report data=sashelp.cars ;
   col origin enginesize mpg_city;
   where mpg_highway gt 45;
run;

title;
footnote;
ods graphics on / reset noborder;
proc sgplot data=sashelp.cars;
   where mpg_highway gt 45;
   scatter x=enginesize y=mpg_city;
run;
ods pdf startpage=now;

title "Top of the Second Page Title";
footnote "Bottom of the second page footnote";

proc report data=sashelp.cars ;
   col make model type;
   where mpg_highway gt 45;
run;

title;
footnote;
proc sgplot data=sashelp.cars;
   where mpg_highway gt 45;
   scatter x=enginesize y=mpg_highway;
run;

ods pdf close; /* Not needed if using SAS Studio */
ods html;

Program Description

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.
Set the SAS system options.
options nodate;

Open the PDF destination and specify the ODS PDF statement options. The ODS PDF statement opens the PDF destination and the FILE= option specifies PDF filename. The NOTOC option specifies that no table of contents is created. The STARTPAGE=NO option specifies that no new pages are inserted at the beginning of each procedure, or within certain procedures, even if new pages are requested by the procedure code.

    ods pdf file="file.pdf" notoc startpage=no ;

Specify the title and footnote for the first page of output. The title and footnote specified in this step are displayed at the top and bottom of the first page of output.

    title "Top of the First Page Title";
    footnote "Bottom of the first page footnote";

Create the REPORT procedure output for the first page.

    proc report data=sashelp.cars ;
        col origin enginesize mpg_city;
        where mpg_highway gt 45;
    run;

Clear the title and footnote. Specifying a blank TITLE statement prevents the title from printing before the SGPLOT procedure output. Specifying a blank FOOTNOTE statement prevents the footnote from printing after the SGPLOT procedure output.

    title;
    footnote;

Create the SGPLOT procedure output for the first page.

    ods graphics on / reset noborder;
    proc sgplot data=sashelp.cars;
        where mpg_highway gt 45;
        scatter x=enginesize y=mpg_city;
    run;

Begin a new page and specify a title and footnote for the page. The STARTPAGE=NOW option forces the immediate insertion of a new page. The TITLE and FOOTNOTE statements specify a title and footnote for the new page.

    ods pdf startpage=now;

    title "Top of the Second Page Title";
    footnote "Bottom of the second page footnote";

Create the REPORT procedure output for the second page.

    proc report data=sashelp.cars ;
        col make model type;
        where mpg_highway gt 45;
    run;
Clear the title and footnote. Specifying a blank TITLE statement prevents the title from printing before the SGPLOT procedure output. Specifying a blank FOOTNOTE statement prevents the footnote from printing after the SGPLOT procedure output.

title;
footnote;

Create the SGPLOT procedure output for the second page.

proc sgplot data=sashelp.cars;
  where mpg_highway gt 45;
  scatter x=enginesize y=mpg_highway;
run;

Close the PDF destination and open the HTML destination. The ODS PDF CLOSE statement closes the PDF destination and all of the files that are associated with it. You must close the destinations before you can view the output with a browser or before you can send the output to a physical printer. The ODS HTML statement opens the HTML destination and returns SAS to the default ODS destination.

ods pdf close; /* Not needed if using SAS Studio */
ods html;

PDF Output

If you had used STARTPAGE=YES instead of STARTPAGE=NOW in this example, a three-page PDF file is created with second SGPLOT output on the third page.
Example 8: Suppressing a Page Break

Features:
- ODS PDF statement option:
  - FILE=
  - NOTOC
  - STARTPAGE=NO
- ODS GRAPHICS statement
- ODS HTML
- FOOTNOTE statement
- OPTIONS statement
- PROC REPORT
- PROC SGSCATTER
- TITLE statement

Details

The following example illustrates a basic behavior of the STARTPAGE= option. The STARTPAGE= option does not have to be specified on the first ODS PDF statement. In this example, the STARTPAGE=NO setting is made after the first PROC step and takes effect immediately to combine the PROC SGSCATTER results on the first page.

Also, this example illustrates that populated title and footnotes are included in the PROC SGSCATTER portion of the next example. Title and footnote text is embedded in any image created by SAS/GRAph and ODS GRAPHICS output.
ods html close; /* Not needed if using SAS Studio */
options nodate;
ods pdf file="file.pdf" notoc;

title "Top Of the Page Title";
footnote "Bottom of the page footnote";

proc report data=sashelp.cars (obs=15);
col origin enginesize mpg_city mpg_highway type cylinders ;
run;

ods pdf startpage=no;
ods graphics on / reset noborder;
title "Title Embedded In the Image";
footnote "Footnote embedded in the image";
proc sgscatter data=sashelp.cars;
plot mpg_highway*weight mpg_city*weight;
run;

ods pdf close; /* Not needed if using SAS Studio */
ods html;

Program Description

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML CLOSE statement closes the HTML destination to conserve resources. If the destination were left open, then ODS would produce both HTML and PDF output.

ods html close; /* Not needed if using SAS Studio */

Set the SAS system options.

options nodate;

Open the PDF destination and specify a title and footnote. The ODS PDF statement opens the PDF destination and the FILE= option specifies the PDF filename. The NOTOC option specifies that no table of contents is created. The TITLE and FOOTNOTE statements specify a title and footnote for the top and bottom of the page.

ods pdf file="file.pdf" notoc;

title "Top Of the Page Title";
footnote "Bottom of the page footnote";

Create the REPORT procedure output.

proc report data=sashelp.cars (obs=15);
col origin enginesize mpg_city mpg_highway type cylinders ;
run;
**Prevent a page break.** The STARTPAGE=NO option specified in the ODS PDF statement prevents a page break.

```sas
ods pdf startpage=no;
```

**Create the SGSCATTER procedure output and specify a title and footnote.** The title and footnote specified before an ODS graphics procedure step are embedded in the image.

```sas
ods graphics on / reset noborder;
title "Title Embedded In the Image";
footnote "Footnote embedded in the image";
proc sgscatter data=sashelp.cars;
    plot mpg_highway*weight mpg_city*weight;
run;
```

**Close the PDF destination and open the HTML destination.** The ODS PDF CLOSE statement closes the PDF destination and all of the files that are associated with it. You must close the destinations before you can view the output with a browser or before you can send the output to a physical printer. The ODS HTML statement opens the HTML destination and returns SAS to the default ODS destination.

```sas
ods pdf close;  /* Not needed if using SAS Studio */
ods html;
```
Output 6.17  Preventing a Page Break in PDF Output

**Top Of the Page Title**

<table>
<thead>
<tr>
<th>Origin</th>
<th>Engine Size (L)</th>
<th>MPG (City)</th>
<th>MPG (Highway)</th>
<th>Type</th>
<th>Cylinders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>3.5</td>
<td>17</td>
<td>23</td>
<td>SUV</td>
<td>6</td>
</tr>
<tr>
<td>Asia</td>
<td>2</td>
<td>24</td>
<td>31</td>
<td>Sedan</td>
<td>4</td>
</tr>
<tr>
<td>Asia</td>
<td>2.4</td>
<td>22</td>
<td>29</td>
<td>Sedan</td>
<td>4</td>
</tr>
<tr>
<td>Asia</td>
<td>3.2</td>
<td>20</td>
<td>28</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Asia</td>
<td>3.5</td>
<td>18</td>
<td>24</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Asia</td>
<td>3.2</td>
<td>17</td>
<td>24</td>
<td>Sports</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>1.8</td>
<td>22</td>
<td>31</td>
<td>Sedan</td>
<td>4</td>
</tr>
<tr>
<td>Europe</td>
<td>1.8</td>
<td>23</td>
<td>30</td>
<td>Sedan</td>
<td>4</td>
</tr>
<tr>
<td>Europe</td>
<td>3</td>
<td>20</td>
<td>28</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>3</td>
<td>17</td>
<td>25</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>3</td>
<td>18</td>
<td>25</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>3</td>
<td>20</td>
<td>27</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>3</td>
<td>18</td>
<td>25</td>
<td>Sedan</td>
<td>6</td>
</tr>
<tr>
<td>Europe</td>
<td>3</td>
<td>20</td>
<td>27</td>
<td>Sedan</td>
<td>6</td>
</tr>
</tbody>
</table>

**Title Embedded In the image**

**Footnote embedded in the image**

**Bottom of the page footnote**
Example 9: How to Use Drill-Down and Link to a Target in a PDF File

Features:

ODS PDF statement option:
- FILE=
- ANCHOR=
- STYLE=

PROC GCHART
GOPTIONS statement
FOOTNOTE statement
PROC SORT
TITLE statement

Details

Starting in SAS 9.4m5, ODS PDF supports linking (drilling down) to targets or destinations in PDF documents. For an explanation how to link to graphs generated using SAS/GRAPH, see "Adding Drill-Down Graphs in Your PDF File" in SAS/GRAPH: Reference.

Program

```sas
%let outpath=.;
data cars;
  length url $60;
  set sashelp.cars;
  url="/cars.pdf#" || strip(origin);
run;
proc sort data=cars;
  by origin;
run;
ods _all_ close; /* Not needed if using SAS Studio */
goptions reset=all border vsize=350pt hsize=420pt;
ods pdf style=daisy anchor="#BYVAL" file="\cars.pdf";
proc gchart data=cars;
  pie type / sumvar=mpg_highway type=mean;
    by origin;
run;
quit;
ods _all_ close; /* Not needed if using SAS Studio */
title "Mean Highway MPG and Vehicle Origin";
footnote "Click a bar for details";
ods pdf style=daisy file="\sales.pdf";
proc gchart data=cars;
  vbar origin / sumvar=mpg_highway type=mean url=url;
run;
quit;
ods pdf close; /* Not needed if using SAS Studio */
goptions reset=all;
```
Program Description

Specify the data set.

```sas
%let outpath=.;
data cars;
  length url $60;
  set sashelp.cars;
  url="/cars.pdf#" || strip(origin);
run;
```

Sort the data.

```sas
proc sort data=cars;
  by origin;
run;
```

ods _all_ close;   /* Not needed if using SAS Studio */

Generate a PDF with target graphs.

```sas
goptions reset=all border vsize=350pt hsize=420pt;
ods pdf style=daisy anchor="#BYVAL" file="\cars.pdf";
proc gchart data=cars;
  pie type / sumvar=mpg_highway type=mean;  by origin;
run;
quit;
ods _all_ close;   /* Not needed if using SAS Studio */
```

Define the target URLs for the drill-down graph The URL= option in the VBAR statement specifies the column in the plot data that provides the drill-down URLs for the bars. The data provides a unique URL for each origin, which, in this case, links to a named target in the target PDF file. In the resulting bar chart, each bar is a hotspot that is linked to its assigned URL.

```sas
title "Mean Highway MPG and Vehicle Origin";
footnote "Click a bar for details";
ods pdf style=daisy file="\sales.pdf";
proc gchart data=cars;
  vbar origin / sumvar=mpg_highway type=mean url=url;
run;
quit;
ods pdf close;   /* Not needed if using SAS Studio */
```

PDF Drill-Down Output

The bar graph values shown in the image below contain URLs that link to more detailed pie graphs about the respective values.
The Asia value in the bar graph links to the Asia pie graph shown below.
See Also

Other ODS Features

- "DOCUMENT Procedure" in SAS Output Delivery System: Procedures Guide
- For complete documentation about styles, see "Understanding Styles, Style Elements, and Style Attributes" in SAS Output Delivery System: Procedures Guide.
- For a table of style attributes, see "Style Attributes Tables" in SAS Output Delivery System: Advanced Topics.

Statements


ODS RTF Statement

Opens, manages, or closes the RTF destination, which produces output written in Rich Text Format for use with Microsoft Word.

Valid in: Anywhere
Category: ODS: Third-Party Formatted
Default: The default style for the RTF destination is RTF.
Restriction: When a table that is generated using SAS is copied and pasted into or imported into a Word document, it is assigned the Word style "Normal". As a result, most of the custom ODS formatting is lost, and the output does not display as expected.
Interactions: By default, when you execute a procedure that uses the FORMCHAR system option (for example, PROC PLOT or PROC CHART), ODS formats the output in SAS Monospace font. If you are creating output that will be viewed in an operating environment that does not have SAS software installed, this output will not be displayed correctly. The SAS Monospace font is not recognized if SAS is not installed. For the correct display of your document, include the following statement before your SAS program:

```sas
OPTIONS FORMCHAR="|----|+|---+=|-/<>*/";
```

To change the page orientation of the RTF output, specify the system option ORIENTATION=. To change the orientation, you will need to trigger the change by issuing the ODS RTF statement after the global options statement. See “Example 3: RTF Interaction with the ORIENTATION= System Option” on page 195 for details.

Tips: When producing large tables, use the ODS TAGSETS.RTF statement. For detailed information, see “ODS TAGSETS.RTF Statement” in SAS Output Delivery System: User’s Guide.

Starting in SAS 9.4, cellx values are computed for all ODS destinations based on CSS standards. In the RTF destination, an attempt is made to honor the cellx value of 1440 twips to 1 inch. The final cellx value takes into account the text width, the accumulated border widths and accumulated padding. An additional 2% fontpadding is added to the text measurement when an explicit dimension has not been provided.
Syntax

**ODS RTF** `<(<ID=> identifier)> action;`

**ODS RTF** `<(<ID=> identifier)> <options> ;`

**Summary of Optional Arguments**

**(ID= identifier)**
Open multiple instances of the same destination at the same time

**ANCHOR= 'anchor-name'**
Specify a unique base name for the anchor tag that identifies each output object in the current body file

**AUTHOR= 'author-text'**
Specify the text string that identifies the author. This text string is inserted into the metadata of a file.

**BASE= 'base-text'**
Specify text to use as the first part of all links and references that ODS creates in output files

**BODYTITLE**
Specify that the titles and footnotes are to be placed into the body of the RTF document and not into the header and footer sections

**BODYTITLE_AUX**
Specify that the titles and footnotes are to be placed into the body of the RTF document and not into the header and footer sections. The titles and footnotes are also placed into cells or tables

**BOX_SIZING=(CONTENTBOX | BORDERBOX)**
Specify how to measure the width of cells. Use to override the default value of BOX_SIZING for a destination

**COLUMNS=n | MAX**
Specify the number of columns to create on each page of output

**CONTENTS**
Specify whether to produce a table of contents page

**CSSSTYLE= 'file-specification'<(media-type-1<…media-type-10>)>**
Specify a cascading style sheet to apply to your output

**DEVICE= device-driver**
Specify a device for the RTF output destination

**DOM<="external-file">**
Specify that the ODS document object model is written to the SAS log or to an external file

**ENCODING= local-character-set-encoding**
Override the encoding for input or output processing (transcodes) of external files

**EXCLUDE exclusion(s) | ALL | NONE**
Exclude output objects from the destination

**FILE= 'external-file' | fileref**
Open the ODS RTF destination and specify the name of the file to which to write information

**GFOOTNOTE**
**NOGFOOTNOTE**
Specify the location where footnotes are printed in the graphics output

**GTITLE**
NOGTITLE
  Control the location where titles are printed in the graphics output

IMAGE_DPI
  Specify the image resolution for the graphical output

KEEPN
NOKEEPN
  Control where tables split on a page

NEWFILE= starting-point
  Create a new body file at the specified starting point

NOTOC_DATA
  Specify whether contents data is inserted into the RTF file

NOTRKEEP
  Control whether table rows can be split by a page break

OPERATOR= 'text-string'
  Insert the text that you specify into the metadata of the RTF file

PACKAGE <package-name>
  Specify that the output from the destination be added to an ODS package

PATH= aggregate-file-storage-specification | fileref (URL= | libref.catalog 'Uniform-Resource-Locator' | NONE)
  Specify the location of an aggregate storage location or a SAS catalog for all RTF files

PREPAGE= 'text-string'
  Specify a text string that occurs before a table on a page

RECORD_SEPARATOR= 'alternative-separator' | NONE
  Specify an alternative character or string to separate lines in the output files

SASDATE
  Write to the RTF file the time and date that you started your SAS session

SELECT selection(s) | ALL | NONE
  Select output objects for the destination.

SHOW
  Write to the SAS log the current selection or exclusion list for the destination

STARTPAGE= BYGROUP | YES | NO | NOW
  Control page breaks

STYLE= style-template
  Specify a style template to use in writing the RTF files

TEXT= 'text-string'
  Insert text into your RTF output

TITLE= 'title-text'
  Insert the text string that you want as your title into the metadata of a file

TOC_DATA
  Specify whether contents data is inserted into the RTF file

TRANTAB= translation-table
  Specify a translation table to use when you transcode a file for output
Actions

The following actions are available for the ODS RTF statement:

**EXCLUDE exclusion(s) | ALL | NONE**
excludes one or more output objects from the destination.

- **Default**: NONE
- **Restriction**: A destination must be open for this action to take effect.
- **See**: “ODS EXCLUDE Statement” in SAS Output Delivery System: Procedures Guide

**SELECT selection(s) | ALL | NONE**
selects output objects for the specified destination.

- **Default**: ALL
- **Restriction**: A destination must be open for this action to take effect.
- **See**: “ODS SELECT Statement” in SAS Output Delivery System: Procedures Guide

**SHOW**
writes the current selection list or exclusion list for the destination to the SAS log.

- **Restriction**: The destination must be open for this action to take effect.
- **Tip**: If the selection or exclusion list is the default list (SELECT ALL), then SHOW also writes the entire selection or exclusion list. For information about selection and exclusion lists, see “Selection and Exclusion Lists” in SAS Output Delivery System: User’s Guide.
- **See**: “ODS SHOW Statement” in SAS Output Delivery System: User’s Guide

Optional Arguments

**ANCHOR= 'anchor-name'**
specifies the base name for the RTF anchor tag that identifies each output object in the current file.

Each output object must have an anchor tag to which other files link or reference. The references, which ODS automatically creates, point to the name of an anchor. Therefore, each anchor name in a file must be unique.

- **anchor-name** is the base name for the RTF anchor tag that identifies each output object in the current file.

  ODS increments the name that you specify and creates unique anchor names. For example, if you specify ANCHOR= 'tabulate', then ODS names the first anchor tabulate. The second anchor is named tabulate1; the third is named tabulate2, and so on.

- **Requirement**: You must enclose anchor-name in quotation marks.
- **Alias**: NAMED_DEST= | BOOKMARK=
Tips

It is useful to specify new anchor names at various points in your program when you want other RTF files to link to specific parts of your RTF output. Because you can control where the anchor name changes, you know in advance what the anchor name is at those points.

You can change anchor names as often as you want by submitting the ANCHOR= option in an ODS RTF statement anywhere in your program. After you specify an anchor name, it remains in effect until you specify a new one.

**AUTHOR= ‘author-text’**

inserts the text string that you specify as the author into the metadata of a file.

*author-text*

is the text in the metadata of an open file that indicates the author.

**Requirement**

You must enclose *author-text* in quotation marks.

**BASE= ‘base-text’**

specifies the text to use as the first part of references that ODS creates in the output file.

*base-text*

is the text that ODS uses as the first part of all references that ODS creates in the file. Consider this specification:

BASE=’http://www.your-company.com/local-url’

In this case, ODS creates links that begin with the string http://www.your-company.com/local-url/.

**Requirement**

You must enclose *base-text* in quotation marks.

**BODYTITLE**

specifies that SAS titles and footnotes are placed into the body of the RTF document instead of into the headers and footers section of the RTF document.

**Restriction**

The BODYTITLE option can be specified only when you create a new RTF file.

**Interactions**

When you set the STARTPAGE= option to YES (the default), ODS inserts a new page at the start of each procedure. ODS relies on Word to place headers and footers correctly before and after the procedures. When you specify BODYTITLE, titles and footnotes are removed from the header and footer sections of the RTF document. Titles and footnotes are then placed into the body of the document, and are appended to every TABLE. Therefore, when you set the STARTPAGE= option to YES and specify the BODYTITLE option, the titles and footnotes might not repeat on every page. For example, if there is a table that spans multiple pages, the title is on the first page only, and the footnote is on the last page only.

When you specify the BODYTITLE option, Microsoft Word no longer controls the placement of the header and footer text. However, Microsoft Word still controls other header and footer information, such as page number and date.

**Tip**

The background is not honored on the title cells.
See BODYTITLE_AUX option. Use the BODYTITLE_AUX option when you want titles and footnotes placed in tables in the body of the RTF document.

BODYTITLE_AUX

specifies that SAS titles and footnotes be placed into the body of the RTF document instead of into the headers and footers section of the RTF document. These titles and footnotes are put into cells, which allows titles and footnotes to be centered, left-justified, or right-justified.

Restriction You can specify the BODYTITLE_AUX option only when you are creating a new RTF file.

Interactions When you set the STARTPAGE= option to YES (the default), ODS inserts a new page at the start of each procedure. ODS relies on Word for the correct placement of headers and footers before and after the procedures. When you specify BODYTITLE_AUX, titles and footnotes are removed from the header and footer sections of the RTF document. Titles and footnotes are then placed into the body of the document, and they are appended to every TABLE. Therefore, when you set the STARTPAGE= option to YES and you specify the BODYTITLE_AUX option, the titles and footnotes might not repeat on every page. For example, if there is a table that spans multiple pages, then the title is placed on the first page only, and the footnote is placed on the last page only.

When you specify the BODYTITLE_AUX option, Microsoft Word no longer controls the placement of the header and footer text. However, Microsoft Word still controls other header and footer information, such as page number and date.

See BODYTITLE option

Example "Example 2: Justifying Title and Footnotes When You Specify the BODYTITLE_AUX Option" on page 193

BOX_SIZING=(CONTENTBOX | BORDERBOX)

specifies how to measure the width of cells. This option overrides the default value of BOX_SIZING for a destination. The default value is set at the time of installation.

BOX_SIZING is defined by the WC3 specification, the CSS3 Module. For more information, refer to the CSS3 Box Model specification at http://www.w3.org/TR/2002/WD-css3-box-20021024/#box-sizing.

COLUMNS=n | MAX

specifies the number of columns to place across each page of output.

n

is the number of one-inch columns that you want on the page.

MAX

specifies the maximum number of columns for the paper size and margin setting. This value is dependent upon the paper size and page orientation.

Default The number of columns that fit on the page

Interaction When you specify the COLUMNS= option, the STARTPAGE=NO option is not honored.
Tips

Titles are considered tables and not RTF instructions in Measured RTF (ODS TAGSETS.RTF statement). When you use the COLUMNS= option with Measured RTF, titles appear at the top of each column. However, ODS truncates the titles to fit the column width.

If you specify a value greater than the maximum number of columns that can fit on the page, a note is written to the SAS log that states what the maximum value can be for that page.

CONTENTS

produces a table of contents page for RTF documents that are opened in Microsoft Word. The table of contents page contains a Table of Contents field, which puts all of the contents information that is embedded in the document into a table of contents. To expand the table of contents, right-click under the title in Microsoft Word and select Update Field from the selection list.

Restriction

Do not use the CONTENTS option with the NEWFILE option.

Tips

To go to a specific topic in the document, you can double-click or hold down the Ctrl key and click on the topic in the table of contents. You might have to configure Microsoft Word to use the Ctrl + click method by selecting Tools ⇒ Options ⇒ Edit and checking Use Ctrl + Click to follow hyperlink.

You must specify the TOC_DATA option to view the text that is captured in the Table of Contents. If not, the Table of Contents page displays the error message "Error! No table of contents entries found." NOTOC_DATA is the default option that is used.

See

TOC_DATA option

Example

“Example 1: Creating a Table of Contents from Embedded Data” on page 189

CSSSTYLE= 'file-specification' (media-type-1<…media-type-10>)

specifies a cascading style sheet to apply to your output.

file-specification

specifies a file, fileref, or URL that contains CSS code.

file-specification is one of the following:

"external-file"

is the name of the external file.

Requirement

You must enclose external-file in quotation marks.

fileref

is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

See

For information about the FILENAME statement, see “FILENAME Statement” in SAS Global Statements: Reference.

"URL"

is a URL to an external file.

Requirement

You must enclose URL in quotation marks.
(media-type-1<.. media-type-10>)
specifies one or more media blocks that correspond to the type of media that your output is rendered on. CSS uses media type blocks to specify how a document is to be presented on different media: on the screen, on paper, with a speech synthesizer, with a braille device, and so on.

The media block is added to your output in addition to the CSS code that is not contained in any media blocks. By using the media-type suboption, in addition to the general CSS code, you can import the section of a CSS file intended only for a specific media type.

Default
If no media-type is specified in your ODS statement, but you do have media types specified in your CSS file, then ODS uses the Screen media type.

Range
You can specify up to ten different media types.

Requirements
You must enclose media-type in parentheses.

Tip
If you specify multiple media types, all of the style information in all of the media types is applied to your output. However, if there is duplicate style information in different media blocks, then the styles from the last media block are used.

Restriction
The CSSSTYLE= option does not affect SAS/GRAPH output.

Requirement
CSS files must be written in the same type of CSS produced by the ODS HTML statement. To view the CSS code that ODS creates, you can do one of the following:
- specify the ODS TRACE DOM statement
- specify the DOM option

Interaction
If both the STYLE= option and the CSSSTYLE= option are specified in an ODS statement, the option specified last is the option that is used.

See
For complete documentation about ODS and Cascading Style Sheets, see SAS Output Delivery System: Advanced Topics

Example

DEVICE= device-driver
specifies the name of a device driver. ODS automatically selects an optimal default device for each open output destination.

The following table lists the default devices for the most common ODS output destinations. These default devices are used when graphics are created using SAS/GRAPH or ODS Graphics. In the third maintenance release of SAS 9.4, EPUB3 is the default EPUB destination. EPUB2 was the default EPUB version in prior releases of SAS 9.4. This default is set in the Registry. For a complete list of supported devices and file types, see “Supported File Types for Output Destinations” in SAS ODS Graphics: Procedures Guide.
Table 6.5  Default Devices for ODS Output Destinations

<table>
<thead>
<tr>
<th>Output Destination</th>
<th>Default Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPUB2</td>
<td>PNG</td>
</tr>
<tr>
<td>EPUB3 (EPUB)</td>
<td>SVG</td>
</tr>
<tr>
<td>Excel</td>
<td>PNG</td>
</tr>
<tr>
<td>HTML</td>
<td>PNG</td>
</tr>
<tr>
<td>HTML5</td>
<td>SVG</td>
</tr>
<tr>
<td>LISTING</td>
<td>PNG</td>
</tr>
<tr>
<td>Measured RTF</td>
<td>EMF</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>PNG</td>
</tr>
<tr>
<td>RTF</td>
<td>EMF</td>
</tr>
<tr>
<td>Markup Tagsets</td>
<td>PNG</td>
</tr>
</tbody>
</table>

Tip  Specifying a device on the ODS DEVICE= option takes precedence over the SAS global option and the graphics option.


DOM<="external-file"> specifies that the ODS document object model is written to the SAS log or an external file.

external-file is the name of an external output file.

Requirement  You must enclose external-file in quotation marks.

See  For complete documentation about the ODS document object model, see “Working with the ODS Document Object Model” in SAS Output Delivery System: Advanced Topics.

ENCODING= local-character-set-encoding overrides the encoding for input or output processing (transcodes) of external files.

See  For information about the ENCODING= option, see SAS National Language Support (NLS): Reference Guide.
FILE= 'external-file' | fileref
opens the RTF destination and specifies the RTF file or SAS catalog to which to write. This file remains open until you do one of the following actions:
- Close the RTF destination with ODS RTF CLOSE or ODS _ALL_ CLOSE.
- Specify a different file to which to write.

external-file
is the name of an external file to which to write.

Requirement You must enclose external-file in quotation marks.

fileref
is a file reference that has been assigned to an external file. Use the FILENAME statement to assign a fileref.

Restriction You cannot use the FILE=fileref option with the NEWFILE= option.

See The section on statements in SAS Global Statements: Reference for information about the FILENAME statement.

Alias BODY=

Interaction In an ODS RTF statement that refers to an open RTF destination, the FILE= option forces ODS to close the destination and all files that are associated with it. ODS then opens a new instance of the destination. For more information, see “Opening and Closing the RTF Destination” on page 188.

See NEWFILE= option

GFOOTNOTE | NOGFOOTNOTE
controls the location of the footnotes that are defined by the graphics program that generates the RTF output.

GFOOTNOTE
includes all of the currently defined footnotes within the graphics output.

NOGFOOTNOTE
prevents all of the currently defined footnotes from appearing in the graphics file. Instead, they become part of the RTF file.

Default GFOOTNOTE

Restriction This option applies only to SAS programs that produce one or more device-based graphics, or graphics created by the SGPLOT procedure, the SGPANEL procedure, or the SGSCATTER procedure.

GTITLE | NOGTITLE
controls the location of the titles that are defined by the graphics program that generates the RTF output.

GTITLE
includes all of the currently defined titles within the graphics output that is called by the body file.
NOGTITLE
prevents all of the currently defined titles from appearing in the graphics output. Instead, the titles become part of the RTF file.

Default: GTITLE

Restriction: This option applies only to SAS programs that produce one or more device-based graphics, or graphics created by the SGPLOT procedure, the SGPANEL procedure, or the SGSCATTER procedure.

(ID= identifier)
enables you to run multiple instances of the same destination at the same time. Each instance can have different options.

identifier specifies another instance of the destination that is already open. identifier is numeric or a series of characters that begin with a letter or an underscore. Subsequent characters can include letters, underscores, and numeric characters.

Restriction: If identifier is numeric, it must be a positive integer.

Requirement: You must specify the ID= option immediately after the destination name.

Tip: You can omit the ID= option and instead use a name or a number to identify the instance.

Example: “Example 1: Opening Multiple Instances of the Same Destination at the Same Time” on page 140

IMAGE_DPI
specifies the image resolution for graphical output.

Alias: DPI=

Default: 200

CAUTION: When the PDF contains an embedded image and you are using high DPI= or DPI_IMAGE= values (values over 1000), you might need to increase memory allocations. To increase memory, set the MEMSIZE= system option to 500M or higher. You can also decrease the DPI= value to ensure that you do not run out of memory.

KEEPN | NOKEEPN
controls where tables split on a page.

KEEPN: ODS allows table splits only if the entire table cannot fit on one page.

NOKEEPN: ODS lets a table split at a page break.

Tip: Although KEEPN minimizes page breaks in tables, it might use substantially more paper than NOKEEPN. This is because the KEEPN option issues a page break before starting to print any table that does not fit on the remainder of the page.
NEWFILE= **starting-point**
creates a new file at the specified **starting-point**.

**starting-point** can be one of the following:

**BYGROUP**
starts a new file for the results of each BY group.

**NONE**
writes all output to the body file that is currently open.

**OUTPUT**
starts a new file for each output object. For SAS/GRAPH this means that ODS creates a new file for each SAS/GRAPH output file that the program generates.

Alias **TABLE**

**PROC**
starts a new file each time you start a new procedure.

Default **NONE**

**Restriction**
You cannot use the NEWFILE= option with the FILE=fileref option.

**Tip**
If you end the filename with a number, then ODS begins incrementing with that number. In the following example, ODS names the first body file MAY5.XML, and names additional body files MAY6.XML, MAY7.XML, and so on.

**NOTOC_DATA**
See the description of TOC_DATA in this section.

**NOTRKEEP**
specifies that the table row is not kept together and can be split by a page break.

Default **TRKEEP**

**OPERATOR= 'text-string'**
inserts the text that you specify into the metadata of the RTF file.

**text-string**
is the text in the metadata of a file that indicates the author.

**Requirement**
You must enclose **text-string** in quotation marks.

**PACKAGE <package-name>**
specifies that the output from the destination be added to a package.

**package-name**
specifies the name of a package that was created with the ODS PACKAGE statement. If no name is specified, then the output is added to the unnamed package that was opened last.

PATH="aggregate-file-storage-specification" | fileref (URL= | libref.catalog "Uniform-Resource-Locator" | NONE)
specifies the location of an aggregate storage location or a SAS catalog for all RTF files. If the GPATH= option is not specified, all graphics output files are written to the "aggregate-file-storage-specification" or libref.

'aggregate-file-storage-location'
specifies an aggregate storage location such as directory, folder, or partitioned data set.

Requirement You must enclose aggregate-file-storage-location in quotation marks.

fileref
is a file reference that has been assigned to an aggregate storage location. Use the FILENAME statement to assign a fileref.

Interaction If you use a fileref in the PATH= option, then ODS does not use information from PATH= when it constructs links.

See “FILENAME Statement” in SAS Global Statements: Reference.

libref.catalog
specifies a SAS catalog to write to.

See “LIBNAME Statement” in SAS Global Statements: Reference.

URL= 'Uniform-Resource-Locator' | NONE
specifies a URL for the file-specification.

Uniform-Resource-Locator
is the URL that you specify. ODS uses this URL instead of the filename in all the links and references that it creates to the file.

NONE
specifies that no information from the PATH= option appears in the links or references.

Tip This option is useful for building output files that can be moved from one location to another. The links from the contents and page files must be constructed with a single-name URL, and the contents, page, and body files must be in the same location.

Interaction If you use the BODY= or FILE= external file option in conjunction with the PATH= option, the external file specification should not include path information.

PREPAGE='text-string'
specifies a text string that occurs before a table on a page.

text-string
is the text at the top of the table, after the titles. The text is placed before any tables created by the procedure.

Requirement You must enclose text-string in quotation marks.

RECORD_SEPARATOR= 'alternative-separator' | NONE
specifies an alternative record separator. This separator is a character or string that separates lines in the output files.
Different operating environments use different separator characters. If you do not specify a record separator, ODS formats the RTF files for the environment in which you run the SAS job. However, if you are generating files in one operating environment to view in another operating environment that uses a different separator character, you can specify a record separator that is appropriate for the target environment.

*alternative-separator*

represents one or more characters in hexadecimal or ASCII format. For example, the following option specifies a record separator of a carriage-return character and a linefeed character (on an ASCII file system):

```
RECORD_SEPARATOR= '0D0A'x
```

Operating Environment Information: In a mainframe environment, the following option specifies a record separator for a carriage-return character and a linefeed character for use with an ASCII file system:

```
RECORD_SEPARATOR= '0D25'x
```

Requirement You must enclose *alternative-separator* in quotation marks.

*NONE*

produces RTF output that is appropriate for the environment in which you run the SAS job.

Operating Environment Information: In many operating environments, using a value of NONE has the same result as omitting the RECORD_SEPARATOR option.

Operating Environment Information: In a mainframe environment, by default, ODS produces a binary file that contains embedded record-separator characters. This approach means that the file is not restricted by the line-length restrictions on ASCII files. However, this also means that the lines are concatenated if you view the file in an editor. If you want to format the RTF files in a manner that enables you to read them with an editor, use RECORD_SEPARATOR= NONE. In this case, ODS writes one line of RTF at a time to the file. When you use a value of NONE, the logical record length of the file to which you are writing must be at least as long as the longest line that ODS produces. Otherwise, RTF might wrap to another line at an inappropriate place.

**Aliases**

RECSEP=

RS=

**SASDATE**

writes to the RTF file the time and the date that you started your SAS session.

Restriction You can specify SASDATE only when you open a new file. If you specify the option at any other time, ODS writes a warning message to the SAS log.

Interaction To reset the SAS session time that is input into the RTF file, use the DTRESET system option.

See For information about the DTRESET system option, see SAS System Options: Reference.
STARTPAGE= BYGROUP | YES | NO | NOW
controls page breaks.

BYGROUP
specifies to insert page breaks after each BY group.

YES
inserts a new page at the start of each procedure and within certain procedures, as is requested by the procedure code.

Alias ON

Interactions When the STARTPAGE= option is set to YES (the default), ODS inserts a new page at the start of each procedure. ODS relies on Word for the correct placement of headers and footers before and after the procedures. When you specify BODYTITLE, titles and footnotes are removed from the header and footer sections of the RTF document. Titles and footnotes are then placed into the body of the document, and they are appended to every TABLE. Therefore, when you set the STARTPAGE= option to YES and you specify the BODYTITLE option, the titles and footnotes might not repeat on every page. For example, if there is a table that spans multiple pages, the title appears on only the first page, and the footnote appears on only the last page.

Note that when you specify the BODYTITLE option, Microsoft Word no longer controls the placement of the headers and footers text. However, Word still controls other header and footer information, such as page number and date.

NO
instructs ODS not to insert any new pages at the start of each procedure or within certain procedures, even if the procedure code requests new pages. A new page begins only when a page is filled or when you specify STARTPAGE= NOW.

Alias NEVER

Interaction When you specify the COLUMNS= option, the STARTPAGE=NO option is not honored.

NOW
forces the immediate insertion of a new page.

Tip This option is useful primarily when the current value of the STARTPAGE= option is NO. Otherwise, each new procedure forces a new page automatically.

Default YES

Tip Specifying STARTPAGE= NO prevents forced page breaks. You can turn on forced page breaking again by specifying STARTPAGE= YES. You can insert a page break at any time by specifying STARTPAGE= NOW.

STYLE= style-template
specifies the style template for ODS to use to write the RTF files.
style-template
describes how to display the presentation aspects (color, font face, font size, and so on) of your SAS output. A style template determines the overall appearance of the documents that use that style template. Each style template consists of style elements.

Note
If you are using SAS Studio, you do not need to specify the STYLE= option. You can go to Preferences \(\Rightarrow\) Results and change the style from the drop-down list for your selected destination.

See
For a complete discussion of style templates, see “TEMPLATE Procedure: Creating a Style Template” in SAS Output Delivery System: Procedures Guide.

Default
If you do not specify a style template, ODS uses the file that is specified in the SAS registry subkey: ODS \(\Rightarrow\) DESTINATIONS \(\Rightarrow\) RTF. By default, this value specifies RTF for traditional RTF and Measured RTF.

Restriction
Do not use the function syntax for ODS ESCAPECHAR to produce superscripts with the ODS RTF destination. Instead, use the traditional ODS ESCAPECHAR syntax. For example, use the following statement:

```
proc report style(report)=[posttext="SuperScript test \super 2"];
```

instead of this statement:

```
proc report style(report)=[posttext="SuperScript test ^{super 2}" ];
```

**TEXT= 'text-string'**
inserts text into your RTF output.

**text-string**
is the text that you want to insert into your RTF output. You can also use TEXT= to annotate other output.

Requirement
You must enclose a text-string in quotation marks.

Tips
A better way to add text to your RTF output is to use the ODS TEXT= statement or the PROC ODSTEXT statement.

To add text and start a new page, use the ODS TEXT= statement and the ODS TAGSETS.RTF statement with the STARTPAGE=NOW option instead of using ODS TAGSETS.RTF TEXT= and STARTPAGE= options.

Example
"Using the ODS TEXT= statement to Add Text to RTF OUTPUT" in SAS Output Delivery System: User’s Guide

**TITLE= 'title-text'**
inserts the text string that you specify as the title into the metadata of a file.

**title-text**
is the text in the metadata of a file that indicates the title.

Requirement
You must enclose a title-text in quotation marks.

**TOC_DATA | NOTOC_DATA**
specifies whether contents data is embedded in the RTF file as hidden text.
NOTOC_DATA
instructs ODS not to insert contents data into the RTF file.

TOC_DATA
instructs ODS to insert contents data into the RTF file.

Tip Insertion of table of contents data can be resumed in the middle of a SAS program by including the following statement:
ods rtf toc_data;

Default NOTOC_DATA

Tip To create a visible table of contents from the inserted table of contents data, specify the CONTENTS option.

See CONTENTS option

TRANTAB= translation-table
specifies the translation table for ODS to use when it transcodes a file for output.

See For more information, see “TRANTAB= System Option” in SAS National Language Support (NLS): Reference Guide.

Details
Opening and Closing the RTF Destination
You can modify an open RTF destination with many ODS RTF options. However, the FILE= option performs the following actions on an open RTF destination:

- close the open destination referred to in the ODS RTF statement
- close any files associated with the open RTF destination
- open a new instance of the RTF destination

If you use the FILE= option, you should explicitly close the destination yourself.

Understanding How RTF Formats Output
RTF produces output for Microsoft Word. Although other applications can read RTF files, the RTF output might not work successfully with the other applications.

The RTF destination enables you to view and edit the RTF output. ODS does not define the vertical measurement, which means that SAS does not determine the optimal place to position each item on the page. For example, page breaks are not always fixed because you do not want your RTF output tables to split at inappropriate places when you edit your text. Your tables remain intact on one page, or break where you specify.

However, Microsoft Word needs to know the widths of table columns; and Microsoft Word cannot adjust tables if they are too wide for the page. Therefore, ODS measures the width of the text and tables (horizontal measurement). All of the column widths can be set properly by SAS and the table can be divided into panels if it is too wide to fit on a single page.

In short, when producing RTF output for input to Microsoft Word, SAS determines the horizontal measurement and Microsoft Word controls the vertical measurement. Because Microsoft Word can determine how much room there is on the page, your tables are displayed consistently even after you modify your RTF file.
However, in SAS version 9.2, the ODS Measured tagset is introduced. This tagset enables users to specify how and where page breaks occur and when to place titles and footnotes into the body of a page. For information about using Measured RTF, see "ODS TAGSETS.RTF Statement" in SAS Output Delivery System: User’s Guide.

Note: Complex tables that contain a large number of observations can reduce system efficiencies and take longer to process.

ODS RTF and Graphics

ODS RTF produces output in rich text format, which supports three formats for graphics that Microsoft Word can read.

Table 6.6 Graphics Formats Supported by ODS RTF

<table>
<thead>
<tr>
<th>Format for Graphics</th>
<th>Corresponding SAS Graphics Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>emfblips</td>
<td>EMF</td>
</tr>
<tr>
<td>pngblips</td>
<td>PNG</td>
</tr>
<tr>
<td>jpegblips</td>
<td>JPEG</td>
</tr>
</tbody>
</table>

When you do not specify a target device, the default target is EMF. You can also use the ACTIVEX, ACTXIMG, JAVAIMG graphics drivers to generate graphics in your RTF documents. The ACTIVEX driver generates an ActiveX control. The ACTXIMG and JAVAIMG drivers generate PNG files with the ACTIVEX Control or JAVA Applets appropriately. For more information about graphics devices, see SAS/GRAPH: Reference.

Examples:

Example 1: Creating a Table of Contents from Embedded Data

Features:
- ODS RTF statement action: CLOSE
- ODS RTF statement options:
  - CONTENTS
  - NOTOC_DATA
  - TOC_DATA
- #BYVAL parameter in titles
- NOBYLINE|BYLINE system option
- OPTIONS statement
- PROC FORMAT
- PROC PRINT
- PROC SORT
- PROC REPORT
- PROC TABULATE
TITLE statement

The following example creates a table of contents page that contains embedded table of contents data for some procedures but not for others. The insertion of the table of contents data can be turned on and off in the middle of a program.

Program

proc sort data=Grain_Production;
  by year country type;
run;
ods html close;  /* Not needed if using SAS Studio */
ods rtf file='Grain.Rtf' contents toc_data;
options nobyline;
title 'Leading Grain-Producing Countries';
title2 'for #byval(year)';
proc report data=Grain_Production nowindows;
  by year;
  column country type kilotons;
  define country  / group width=14 format=$cntry.;
  define type     / group 'Type of Grain';
  define kilotons / format=comma12.;
  footnote 'Measurements are in metric tons.';
run;
options byline;
title2;
ods rtf notoc_data;
proc tabulate data=Grain_Production format=comma12.;
class year country type;
var kilotons;
table year,
country*type,
kilotons*sum=' ' / box_page_ misstext='No data';
  format country $cntry.;
  footnote 'Measurements are in metric tons.';
run;
ods rtf toc_data;
proc print data=Grain_Production;
run;
ods rtf close;  /* Not needed if using SAS Studio */
ods html;

Program Description

Sort the data set Grain_Production. PROC SORT sorts the data, first by values of the variable Year, then by values of the variable Country, and finally by values of the variable Type.
proc sort data=Grain_Production;
  by year country type;
run;

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML statement closes the HTML destination to conserve resources.

ods html close; /* Not needed if using SAS Studio */

Create RTF output and create a new body file for each page of output. The ODS RTF statement opens the RTF destination and creates RTF output. The CONTENTS option creates a table of contents page that contains a Table of Contents field. All of the contents information that is embedded in the document is placed in the table of contents. However, the table of contents information is not embedded by default into your RTF file. The default is NOTOC_DATA. The embedded TOC data is not shown until you specify the option TOC_DATA.

ods rtf file='Grain.Rtf' contents toc_data;

Replace the default BY line with a new value in the BY line. The NOBYLINE option suppresses the default BY line variable. The #BYVAL parameter specification inserts the current value of the BY variable Year into the title.

options nobyline;
  title 'Leading Grain-Producing Countries';
  title2 'for #byval(year)';

Produce a report. This PROC REPORT step produces a report on grain production. Each BY group produces a page of output, and ODS creates a new body file for each BY group. The NOWINDOWS option instructs PROC REPORT to run without the REPORT window and to send its output to the open output destinations.

proc report data=Grain_Production nowindows;
  by year;
  column country type kilotons;
  define country / group width=14 format=$cntry.;
  define type     / group 'Type of Grain';
  define kilotons / format=comma12.;
  footnote 'Measurements are in metric tons.';
run;

Restore the default BY line and clear the second TITLE statement. The BYLINE option restores the default BY line. The TITLE2 statement clears the second TITLE statement.

options byline;
  title2;

Suppress the insertion of table of contents data into the RTF file. The NOTOC_DATA option instructs ODS not to insert the table of contents data into the RTF file. There will be no entry for the TABULATE procedure in the table of contents page.

ods rtf notoc_data;

The TABLE statement in the PROC TABULATE step uses three dimensions. Year defines pages, Country and Type define the rows, and Kilotons defines the columns. Therefore, PROC TABULATE explicitly produces one page of output for 1995 and one page for 1996, based on the years specified in the Grain_Production data set. ODS also starts a new body file for each page.
proc tabulate data=Grain_Production format=comma12.;
class year country type;
var kilotons;
table year,
country*type,
kilotons*sum=' ' / box=_page_ misstext='No data';
format country $cntry.;
footnote 'Measurements are in metric tons.';
run;

Enable the insertion of table of contents data into the RTF file. The TOC_DATA option instructs ODS to insert the table of contents data into the RTF file. There will be an entry for the PRINT procedure in the table of contents page.

ods rtf toc_data;

Print the Grain_Production data set.

proc print data=Grain_Production;
run;

Close the RTF destination. The ODS RTF CLOSE statement closes the RTF destination and all the files that are associated with it. If you do not close the destination, you cannot view the files in a browser window.

ods rtf close; /* Not needed if using SAS Studio */
ods html;

RTF Output

By default the table of contents is collapsed on the table of contents page. To expand the table of contents, right-click under the title in Microsoft Word and select Update Field from the selection list.

The table of contents contains only entries for PROC REPORT and PROC PRINT. By default the table of contents data is not embedded in the RTF document. To embed the table of contents data, specify the TOC_DATA option, which results in an entry for PROC REPORT. If you specify the NOTOC_DATA option before the
TABULATE procedure, ODS does not insert contents information into the RTF document, and no entry for PROC TABULATE appears in the table of contents. If you specify the TOC_DATA option before the PRINT procedure, ODS inserts contents data, and an entry for PROC PRINT appears in the table of contents.  

Example 2: Justifying Title and Footnotes When You Specify the BODYTITLE_AUX Option

Features:

ODS RTF statement action:
CLOSE

ODS RTF statement options:
BODYTITLE_AUX

FILE=

OPTIONS statement
PROC PRINT

TITLE statement

When you want to place the titles and footnotes in the body of the RTF output, you usually specify the BODYTITLE option. However, to center your titles and footnotes or to justify them, you need to specify the BODYTITLE_AUX option. The preferred way to accomplish this functionality is to use the measured ODS TAGSETS.RTF statement. For more information, see "ODS TAGSETS.RTF Statement" in SAS Output Delivery System: User's Guide.

Program

OPTIONS NODATE NOSTIMER LS=78 PS=60;
ods html close; /* Not needed if using SAS Studio */
ods rtf file="bodytitle_aux.rtf" bodytitle_aux;
proc print data=sashelp.class;
run;
title j=l "left" j=c "center" j=r "right";
Program Description

The following example shows how to left-justify, right-justify, and center titles and footnotes in the body of the output.

Specify the layout of the output. Instruct ODS not to print the date or time on the page and not to write any SAS statistics to the SAS log. Set the page size to 60 and the line size to 78.

```sas
OPTIONS NODATE NOSTIMER LS=78 PS=60;
```

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML statement closes the HTML destination to conserve resources.

```sas
ods html close; /* Not needed if using SAS Studio */
```

Create RTF output. The ODS RTF statement opens the RTF destination and creates RTF output. The BODYTITLE_AUX option tells SAS to place the titles and footnotes in the body of the output. In addition, this option places the titles and footnotes into cells.

```sas
ods rtf file="bodytitle_aux.rtf" bodytitle_aux;
```

Print the Sashelp.Class data set.

```sas
proc print data=sashelp.class;
run;
```

Add titles and footnotes to the output. Because you have specified the BODYTITLE_AUX option, ODS adds the titles and footnotes to the body of the output and places the text into cells. The J= style specifies the position of the title and footnote text on the page: left, center, or right.

```sas
title j=l "left" j=c "center" j=r "right";
title2 j=l "left";
title3 j=c "center";
title4 j=r "right";
footnote j=l "left" j=c "center" j=r "right";
run;
```

Close the RTF destination. The ODS RTF CLOSE statement closes the RTF destination and all the files that are associated with it. If you do not close the destination, you cannot view the files in a browser window.

```sas
ods rtf close; /* Not needed if using SAS Studio */
ods html;
```

The following output shows how ODS places the titles and footnotes into the body of the output when you specify the BODYTITLE_AUX option. The text of the titles and footnotes are then placed into cells and tables. The JUSTIFY style element is then used to center, right-justify, or left-justify the title and footnote text.
Example 3: RTF Interaction with the ORIENTATION= System Option

Features:

ODS RTF statement action:
CLOSE

ODS RTF statement option:
FILE=

OPTIONS statement: ORIENTATION option

PROC PRINT
TITLE statement

When you want to change the page orientation for RTF, specify the ORIENTATION= system option. To activate or trigger this change of the page orientation, the ODS RTF statement needs to follow the ORIENTATION= option. The following example provides example code for specifying a page orientation change within an RTF file.

Program

OPTIONS NODATE NOSTIMER LS=78 PS=60;
ods html close; /* Not needed if using SAS Studio */
title 'Page Orientation';
Specify the layout of the output. Instruct ODS not to print the date or time on the page and not to write any SAS statistics to the SAS log. Set the page size to 60 and the line size to 78.

**OPTIONS NODATE NOSTIMER LS=78 PS=60;**

Close the HTML destination so that no HTML output is produced. The HTML destination is open by default. The ODS HTML statement closes the HTML destination to conserve resources.

**ods html close; /* Not needed if using SAS Studio */**

Add titles and footnotes to the output. Add a title for the overall file output and then titles that describe the changing orientation.

**title 'Page Orientation';**
**title2 'Default';**

Create RTF output. The ODS RTF statement opens the RTF destination and creates RTF output. In this case, the statement also triggers the change in the page orientation from the default.

**ods rtf file="ChgOrientation.rtf";**

Print the Sashelp.Class data set with only one observation. The page orientation is the default orientation, which is portrait.

**proc print data=sashelp.class (obs=1);**
**run;**

Add a title to change the page orientation in the output file. Add a title to change the page orientation to landscape.

**title 'Page Orientation';**
**title2 'Landscape';**

Specify the system option that changes the page orientation.

**options orientation=landscape;**

Trigger the page orientation change. This RTF statement triggers the change of the page orientation from portrait to landscape.

**ods rtf;**

```sas
/* Not needed if using SAS Studio */
```
Print the Sashelp.Class data set with only one observation.

```sas
proc print data=sashelp.class (obs=1);
run;
```

**Close the RTF destination.** The ODS RTF CLOSE statement closes the RTF destination and all the files that are associated with it. If you do not close the destination, you cannot view the files in a browser window.

```sas
ods rtf close; /* Not needed if using SAS Studio */
ods html;
```

**RTF Output**

The following shows the RTF output for the first page. The orientation is portrait, which is the default.

The following shows the RTF output for the second page. The orientation was changed to landscape.
Example 4: RTF Using NOTRKEEP Option

The default behavior when a single cell does not fit on a page is for Microsoft Word to truncate the cell. When the NOTRKEEP option is specified, the cell splits at a page break and continues on the next page. The following example provides example code for specifying the NOTRKEEP option within an ODS RTF statement.

Program

```sas
data test;
  length string $ 4010;
  string=repeat('1',1000)||repeat('2',1000)||repeat('3',1000)||repeat('4',1000)||'END';
  output;
  string='ABC';
  output;
  run;
ods rtf body="NOTRKEEP.rtf" NOTRKEEP ;
proc print data=test;
  run;
ods rtf close;  /* Not needed if using SAS Studio */
```

Program Description

Load the data set.

```sas
data test;
  length string $ 4010;
  string=repeat('1',1000)||repeat('2',1000)||repeat('3',1000)||repeat('4',1000)||'END';
  output;
  string='ABC';
```
Specify the NOTRKEEP option in the ODS RTF statement to enable a page break.

```sas
ods rtf body="NOTRKEEP.rtf" NOTRKEEP ;
proc print data=test;
run;
```

Close the RTF destination.

```sas
ods rtf close; /* Not needed if using SAS Studio */
```

**RTF Output**

The following ODS RTF output illustrates the use of the NOTRKEEP option. Microsoft Word uses the next page to display the full value of the STR variable.
The following ODS RTF output illustrates the default of the NOTRKEEP option (TRKEEP).

<table>
<thead>
<tr>
<th>Obs</th>
<th>STRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>A BC</td>
</tr>
</tbody>
</table>
### The SAS System

<table>
<thead>
<tr>
<th>Obx</th>
<th>STRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>ABC</td>
</tr>
</tbody>
</table>
SAS Statement That Controls ODS Graphics Processing

Graphics Processing and Environment Options

The ODS GRAPHICS Statement enables or disables ODS Graphics processing and sets graphics environment options. ODS Graphics is enabled by default, unless you are running SAS in batch mode. For detailed information, see “ODS GRAPHICS Statement” in SAS ODS Graphics: Procedures Guide.
Using the FONTREG Procedure

Register fonts in the SAS registry with the FONTREG procedure, to augment those TrueType and Type1fonts that come installed with SAS. These system fonts can be used in SAS output. For more information, see “Registering Fonts” on page 39.

Using the OPTIONS Procedure

The OPTIONS procedure is a discovery tool that lists the current settings of SAS system options. The SAS log displays the results. For details about the SAS procedure that discovers SAS system option settings, see the “OPTIONS Procedure” in SAS System Options: Reference.

Using the PRTDEF Procedure

A system administrator uses this procedure with its USESASHELP option to create printer definitions in the Sashelp library and make these printers available to an individual or to all SAS users at your site. The PRTDEF procedure can be used to do printer management activities. It is especially useful if you use SAS in batch mode.
An individual user can create personal printer definitions in their Sasuser library by using the PRTDEF procedure. In either case, one is required to provide a SAS data set that contains printer attribute variable values. For details and examples, see "Managing Universal Printers Using the PRTDEF Procedure" on page 17 and the "PRTDEF Procedure" in Base SAS Procedures Guide.

### Using the QDEVICE Procedure

This procedure is useful for viewing universal printer definitions for a specific printer, such as PDF. You can also use the QDEVICE procedure to view the list of fonts installed for a device or a printer. Or use it to determine whether the printer that you are using supports font embedding. For more information, see “QDEVICE Procedure” in Base SAS Procedures Guide.

### Using the REGISTRY Procedure

The REGISTRY procedure is useful in maintaining the SAS registry. For example, you can import, validate, diagnose, or uninstall registry files. Use this procedure to view the list of available Universal Printers and printer prototypes that SAS provides. For more information, see “REGISTRY Procedure” in Base SAS Procedures Guide.