

Creating Adobe Pdf Files from SAS Graph Output

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Introduction

As more companies and individuals move online, the demand for reporting information electronically will continue to increase. The need to provide information electronically is confounded by the variety of hardware and software platforms in use. This variability in systems can result in files being reformatted for a particular device or resolution, preventing a standard presentation of the information to the audience. Adobe Portable Document Format (Pdf) provides a method for ensuring standard presentation of information across the different hardware and software used by the end users. This paper discusses the different methods for creating Adobe Pdf files from SAS Graph output. For this paper, all files and graphs were created on a Windows NT 4.0 system with Adobe Acrobat and Reader 4.0 installed.

PDF files, what are they good for?

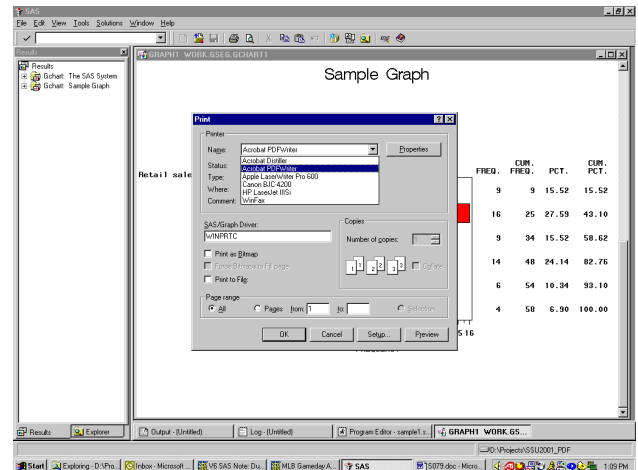
Pdf files are used with increasing frequency for on-line forms, documents, manuals and reports. They can be found in many places including the SAS Online Documentation and IRS Tax forms and publications. The Adobe Portable Document Format provides a platform for ensuring the standard presentation of information across different hardware and software systems. Once created, the Pdf file retains all of the fonts, graphics, colors and formatting regardless of the platform. By downloading and installing the free Adobe Acrobat Reader, most anyone can open Pdf files. The Adobe Acrobat Reader is available for systems such as Windows, Macintosh, Linux, Solaris, Unix, IBM AIX, OS2, Sun SPARCstation and the recently released version for Palm OS 3.1 or higher. The ability to provide individual users with the same file regardless of their system saves time and money and greatly simplifies the publishing process.

Creating Pdfs using SAS Version 6

Version 6 does not include any Pdf drivers, requiring a multi-step process for generating Pdf files from SAS Graph output. Both of the processes discussed here require the installation of Adobe Acrobat, software used to generate Pdf files from other systems. Once installed, Adobe Acrobat provides two methods for placing SAS Graphs into Pdf files, the Adobe PDFWriter print driver and the Adobe Acrobat Distiller.

Creating Single Page PDF files

For creating single page file from a single SAS Graph, the process includes running the graph, selecting File/Print from the SAS menu bar, then selecting the Adobe PDFWriter under the printer name list, and providing a path and filename when prompted.



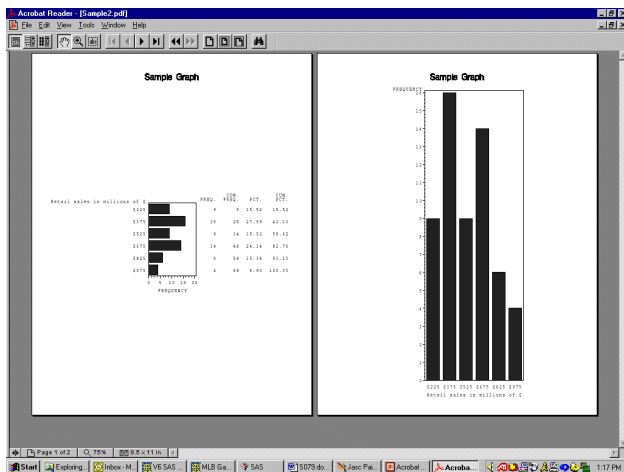
If you have several single page Graphs to process, this can take some time to do and for large scale processing, it is not an efficient process.

Creating Multi-Page PDF Files

Creating a single Pdf file from multiple SAS Graphs requires a different process. This method may also be used if the job requires numerous single page files, making the above method too time consuming. This requires the graphs to be saved as Postscript files and then translated into Pdf files using the Adobe Distiller. The following program creates two graphs from SASHELP.RETAIL with the output being saved to a Postscript file named Sample2.ps. The filename statement assigns a Graphics Stream File destination for the output and the GACCESS option directs the output to the postscript file. GSFNAME may be substituted for GACCESS. The GSF file will contain the SAS Graphs exported in the format specified by the device listed in the goptions statement. In this case, the graphs are being exported using the 300 DPI Postscript Driver. In order to export multiple graphs to a single file, GSFMODE must be set to APPEND.

```
filename gsfname 'd:\projects\ssu2001_pdf\Sample2.ps';
goptions device=ps300 gaccess=gsfname gsfmode=append;
proc gchart data=sashelp.retail;
  title 'Sample Graph';
  hbar sales;
  vbar sales;
run;
quit;
```

Once the graphs have been export to the Postscript file, Adobe Distiller can be used to translate the Postscript into a multi-page Pdf file like the one below.



This method requires Adobe Distiller, part of the Adobe Acrobat package but it provides a powerful tool for generating numerous Pdfs from SAS Graph output, either single page or multi-page by dynamically creating the filerefs for storing the exported graphs. The following macro creates three two-page postscript files by using the macro variable FILENAME to assign the fileref for each file.

```
%macro graphs(filename);
  filename gsf "d:\projects\ssu2001_pdf\&filename..ps";
  goptions dev=ps300 gaccess=gsf gsfmode=append;
  proc gchart data=sashelp.retail;
    title "&filename";
    hbar sales;
    vbar sales;
    run;
  quit;
%mend;
%graphs(sample2a);
%graphs(sample2b);
%graphs(sample2c);
```

Once this program is run and the postscript files created, the Adobe Distiller can be set to watch the folder and it will process all postscript files within the folder. The advantage to this is that hundreds or thousands of postscript files can be created and the Adobe Distiller can translate them to Pdfs during off hours.

Creating Pdfs using SAS Version 7

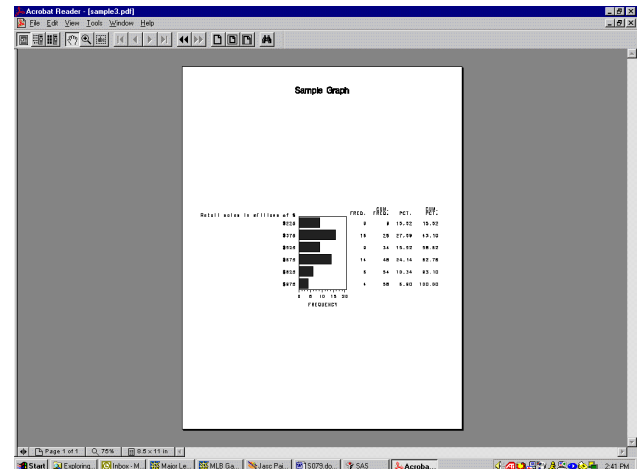
Version 7 of SAS introduces the PDF and PDFC (color) device drivers for creating Pdf output directly from SAS. Instead of specifying the postscript driver for the device, specify either of the two PDF drivers to create the file or files.

Creating Single Page PDF files

The following code creates a single page Pdf file from a single SAS Graph. The program is the same for the single postscript file but the device is set to PDF instead of PS300 and the file extension is PDF instead of PS.

```
filename gsf "d:\projects\ssu2001_pdf\sample3.pdf";
options gaccess=gsf dev=pdf;
proc gchart data=sashelp.retail;
  title 'Sample Graph';
  hbar sales;
  run;
quit;
```

The resulting Pdf file looks like:

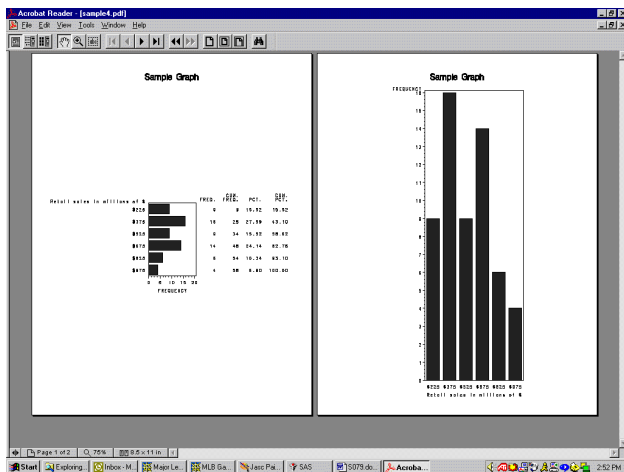


Creating Multi-Page PDF Files

The method for creating a multi-page Pdf from more than one SAS Graph is the same with one exception.

```
filename gsf "d:\projects\ssu2001_pdf\sample4.pdf";
options reset=all gaccess=gsf dev=pdf target=ps300
gsfmode=append;
proc gchart data=sashelp.retail;
  title 'Sample Graph';
  hbar sales;
  vbar sales;
  run;
quit;
```

In this situation, a target device must be specified and it must contain a value other than Pdf. In the above example, the target device is the 300 DPI Postscript driver. If the target device is not specified or the target device is set to Pdf, an error will occur when viewing the second page and it will appear blank. Using the above code to create a two page Pdf file from the two graphs with the device target set to PS300 results in the following Pdf file. This method works when the graphs are produced under the same SAS Graph procedure.



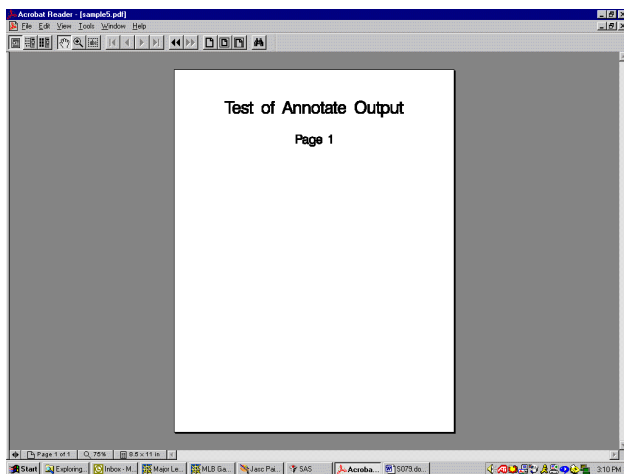
An exception to the rule: SAS Graph Output from Multiple SAS Graph Procedures

There is a problem with using the Pdf device driver to create multi-page Pdf files from multiple SAS Graph Procedures. The following program creates a single page Graph output using one Proc Gslide procedure to display simple Annotate graphics.

```
filename gsf 'd:\projects\ssu2001_pdf\sample5.pdf';
%annomac;
options reset=all device=pdf target=ps300 gaccess=gsf
gsfmode=append ;
```

```
data temp;
length text $100 function color style $8;
retain xsys ysys '3';
%label(50,95,'Test of Annotate Output',black,0,0,2,swiss,5);
%label(50,85,'Page 1',black,0,0,1.5,swiss,5);
run;
proc gslide anno=temp;
run;
quit;
```

Below is the result of this program.

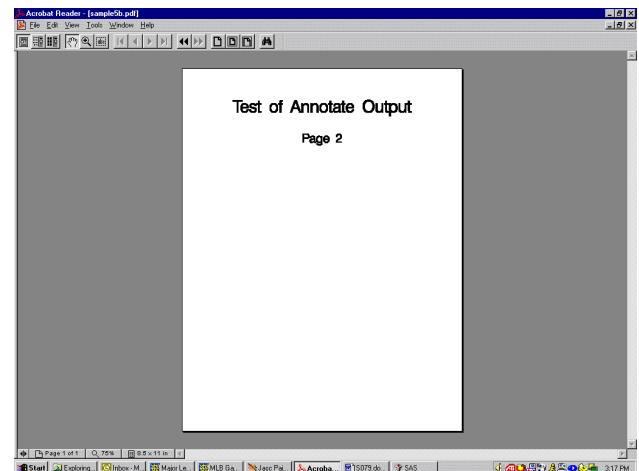


The problem arises when the output from more than one SAS Graph procedures are exported to the same Graphics Stream File using the PDF driver. If we put the code above into a macro and run the Proc Gslide twice to

create a two page Pdf file, only the last page is created in the file.

```
filename gsf 'd:\projects\ssu2001_pdf\sample5b.pdf';
%annomac;
options reset=all device=pdf target=ps300 gaccess=gsf
gsfmode=append ;
%macro test(page);
data temp;
length text $100 function color style $8;
retain xsys ysys '3';
%label(50,95,'Test of Annotate Output',black,0,0,4,swiss,5);
%label(50,85,'Page '||left(trim("&page")),black,0,0,3,swiss,5);
run;
proc gslide anno=temp;
run;
quit;
%mend;
%test(1);
%test(2);
```

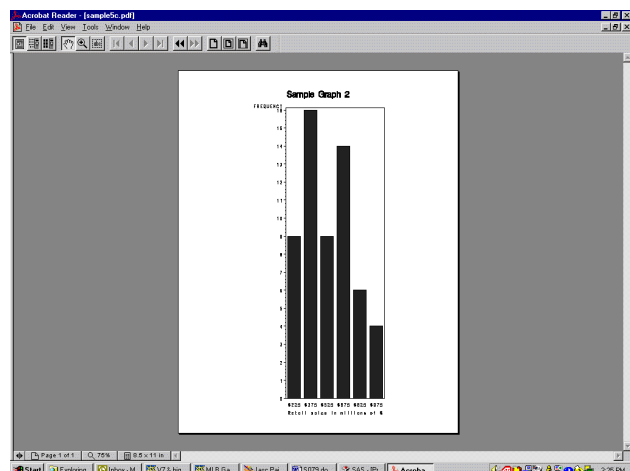
This programs creates two pages but only the second page is viewable in the Pdf file.



Likewise, running two different SAS Graph Procedures and exporting the results to the same Graphics Stream File produces the same result, only the last page is saved. For example,

```
filename gsf 'd:\projects\ssu2001_pdf\sample5c.pdf';
options reset=all gaccess=gsf dev=pdf target=ps300
gsfmode=append ;
proc gchart data=sashelp.retail;
title 'Sample Graph 1';
hbar sales;
run;
quit;
proc gchart data=sashelp.retail;
title 'Sample Graph 2';
vbar sales;
run;
quit;
```

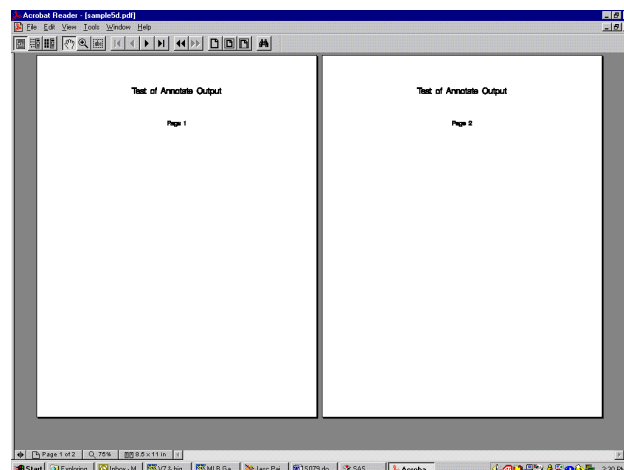
This program results in a Pdf file that only contains the vertical bar chart run in the second procedure.



SAS Note SN-000918 deals with this issue and provides a solution to the problem.

```
filename gsasfile 'd:\projects\ssu2001_pdf\sample5c.pdf';
%annomac;
goptions reset=all;
goptions nodisplay device=pdf ;
%macro annotest(page);
data temp;
length text $100 function color style $8;
retain xsys ysys '3';
%label(50,95,'Test of Annotate Output',black,0,0,2,swiss,5);
%label(50,85,'Page '||left(trim("&page")),black,0,0,1.5,swiss,5);
run;
proc gslide anno=temp;
run;
quit;
%mend;
%annotest(1);
%annotest(2);
goptions display gaccess=gsasfile gsfmode=append;
proc greplay nofs;
igout work.gseg;
replay _all_;
run;
quit;
```

In this situation, the output from the two separate Gslide procedures are stored in the work.gseg catalog and then replayed to the Graphics Stream File using a single SAS Graph Procedure, Proc Greplay. This allows both pages to be created correctly in the Pdf file.



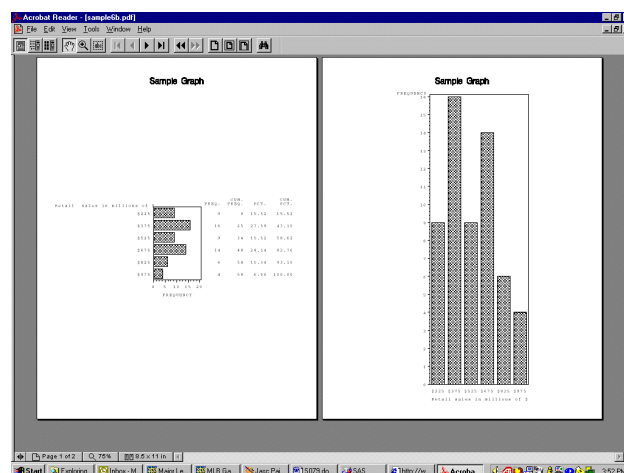
The caution here is that if multiple files are to be created using this method, the work.gseg catalog needs to be deleted before each file is created otherwise the next file will contain the graph output from the current output as well as the previous output.

Creating Pdfs using SAS Version 8.01

The major difference between Version 7 and Version 8.01 is that for creating multi page files from a single SAS Graph Procedure, the target device is no longer needed. The two page Pdf file can be created without specifying the target device.

```
filename gsasfile 'd:\projects\ssu2001_pdf\sample6b.pdf';
goptions reset=all gaccess=gsasfile dev=pdf gsfmode=append ;
proc gchart data=sashelp.retail;
title 'Sample Graph';
hbar sales;
vbar sales;
run;
quit;
```

Taking out the target=PS300 has no effect on the exporting of the graphics output except that the bars are shaded instead of solid.



As in Version 7, if the graphics output is generated by multiple SAS Graph procedures, the Proc Greplay method described above must be used.

Creating Pdfs using SAS Version 8.2

In Version 8.2, the multiple SAS Graph Procedure output to a single Graphics Stream File problem using the Pdf driver still exists. The Adobe Distiller method or the Proc Greplay method are still options in Version 8.2 using the Pdf driver.

Last but not least, ODS

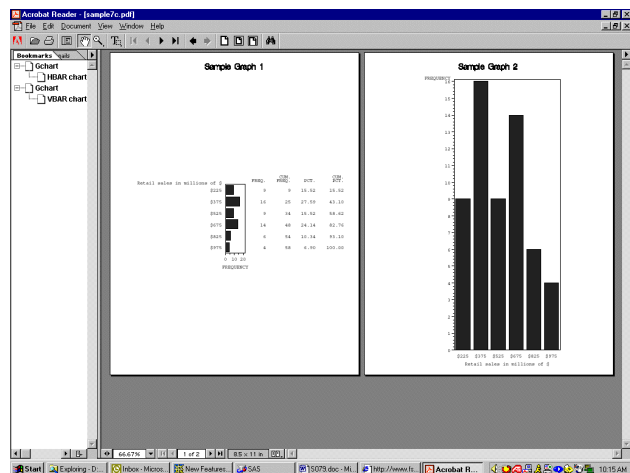
In Version 8.1, ODS provided a method for exporting output to Pdf files using ODS PRINTER PDF but only under certain conditions. This was experimental in 8.1 but is production in Version 8.2. This method allows for the exporting of output from multiple SAS Graph Procedures to a single Pdf file.

```
ods printer pdf file='d:\projects\ssu2001_pdfs\sample7c.pdf';  
goptions target=winprtg;
```

```
proc gchart data=sashelp.retail ;  
  title 'Sample Graph 1';  
  hbar sales ;  
run;  
quit;
```

```
proc gchart data=sashelp.retail ;  
  title 'Sample Graph 2';  
  vbar sales ;  
run;  
quit;  
ods printer close;
```

This program creates the following file.



There are a couple of details worth mentioning. In order to force the bars to be black, the goptions statement with target=winprtg was added to format the output based on the Windows gray scale print driver. The second detail to note is when ODS creates the Pdf file, it also creates bookmarks, which are located in the far left column of the file above. In Pdf files, the bookmarks allow for moving from page to page by clicking on any given bookmark. The bookmark display can be hidden in Adobe Reader under Window>Hide Bookmarks. ODS PRINTER PDF provides a method for the direct creation of multipage Pdf files from multiple SAS Graph Procedures.

Conclusion

This paper provides a simple overview of creating Pdf files from SAS Graph Output. The ability to create Pdf files from SAS Graph Output provides a powerful tool for distributing information electronically in a consistent format. The flexibility and power of SAS linked with the universal nature of the Portable Document Format provides a way to generate thousands of documents that can be made available on the web or distributed in other electronic medium.

References

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