

## SG Procedure Notes

Statistical graphics procedures use the following:

- standard TITLE, FOOTNOTE, BY, LABEL, FORMAT, and WHERE statements
- ODS GRAPHICS statement for image name, image type, and size
- ODS destination statement for output type (HTML, PDF, etc.), style, and image resolution

Statistical graphics procedures do not use the following:

- SAS/GRAPH<sup>®</sup> AXIS, LEGEND, NOTE, SYMBOL, PATTERN, and GOPTIONS statements

ODS Graphics has no connection to traditional device-based GRSEG graphics infrastructure.

## SAS Windowing Environment

If you are using the SAS windowing environment, view your graphs in the HTML destination.

## Output Destinations

Use ODS statements to open and close destinations:

```
ods html <options>;
ods listing <options>;
ods pdf <options>;
ods rtf <options>;
ods document <options>;
```

## Modifying Your Graphs

Although ODS Graphics is designed to automate the creation of high-quality statistical graphics, on occasion you might need to modify your graphs. You can make permanent changes by modifying the graph template. You can make immediate, ad hoc changes by using the ODS Graphics Editor, which provides a point-and-click interface. You can enable editing with this command:

```
ods listing sge=on;
```

## PLOTS= Option

Each statistical procedure that supports ODS Graphics has a PLOTS= option that you can use to select graphs and specify options. The PLOTS= option has a common overall syntax for all statistical procedures, but the specific global plot options, plot requests, and plot options vary across procedures. The syntax is as follows:

```
PLOTS <(global-plot-options)>
      <= plot-request <(options)>>
PLOTS <(global-plot-options)>
      <= (plot-request <(options)>
      <... plot-request <(options)>>>
```

Here are some examples:

```
plots=all
plots=none
plots=residuals
plots(only)=residuals
plots(unpack)=diagnostics
plots=diagnostics(unpack)
plots=residuals(smooth)
plots=(trace autocorr)
plots(unpack)
```

Most graphical details are controlled either by graph templates or by styles, not by the PLOTS= option.

For more information, see the following:

*Basic ODS Graphics Examples*

<http://support.sas.com/documentation/prod-p/grstat/9.4/en/PDF/odsbasicg.pdf>

*Advanced ODS Graphics Examples*

<http://support.sas.com/documentation/prod-p/grstat/9.4/en/PDF/odsadvq.pdf>

For complete information, see the SAS 9.4 documentation at

<http://support.sas.com/documentation/>.



# ODS Graphics Tip Sheet

This tip sheet collects frequently used information in one place so you don't have to search through the online documentation. It also gives you examples to take home and try.

ODS Graphics is an extension of ODS (the Output Delivery System). ODS manages procedure output and displays it in a variety of destinations, such as HTML and RTF. With ODS Graphics, statistical procedures produce integrated output that includes both graphs and tables. Procedures that support ODS Graphics create graphs, some by default and some when you specify procedure options.

Three Base SAS<sup>®</sup> statistical graphics procedures (SGPLOT, SGSCATTER, and SGPANEL) use ODS Graphics and provide a convenient syntax for creating a variety of graphs from raw data or from procedure output. With PROC TEMPLATE, the Graph Template Language, and PROC SGRENDER, you can create custom graphs by using a powerful and detailed syntax.

This tip sheet presents the most common procedures, statements, and options that are used to create graphs with ODS Graphics and SAS<sup>®</sup> 9.4.

# SAS<sup>®</sup> ODS Graphics Tip Sheet

## ODS Graphics Overview

You can enable ODS Graphics by specifying the following statement:

```
ods graphics on;
```

ODS Graphics remains enabled until you disable it with the following statement:

```
ods graphics off;
```

- The ODS destination specifies where you see your graphs.
- A graph template determines how a specific graph is constructed. A graph template is a SAS program written in the Graph Template Language (GTL) that provides instructions for creating the graph.
- An ODS style controls the overall appearance of the graph.
- A style template is a program that sets the colors, fonts, and overall appearance of the graph.

## Example Statements and Options

```
ods trace output notes; /* trace output in log */
ods graphics on; /* enable ODS Graphics */
reset=all; /* reset all options */
antialias=on; /* cleaner edges */
antialiasmax=1000; /* max antialias points */
height=4.8in; /* default image height */
width=6.4in; /* default image width */
imagename='graph'; /* image name prefix */
ods html; /* open HTML destination */
path='C:\mydir'; /* HTML and images path */
(url=none); /* all can move together */
file='sasoutput.htm'; /* filename for HTML */
image_dpi=300; /* image resolution */
style=HMTLBlue; /* output style */
proc reg plots=all; /* create all graphs */
model weight = height;
quit;
ods _all_ close; /* close all destinations */
```

## PROC SGPLOT

PROC SGPLOT creates single-cell plots.

```
proc sgplot <options>;
band x=x-var upper=u-var lower=l-var /
<options>;
block x=x-var block=block-var / <options>;
bubble y=y-var x=x-var block=b-var / <options>;
density var / <type=type> <options>;
dot var / <response=r-var> <stat=stat>
<options>;
dropline y=y-var | x=x-var / <options>;
ellipse y=y-var x=x-var / <options>;
fringe var / <options>;
gradlegend <name> / <options>;
[hv]bar var / <response=r-var> <stat=stat>
<options>;
[hv]barbasic var / <options>;
[hv]barparm <category=c-var>
<response=r-var> / <options>;
[hv]box var / <category=c-var> <options>;
heatmap y=y-var x=x-var / <options>;
heatmapparm y=y-var x=x-var
colorgroup=c-var / <options>;
highlow y=y-var x=x-var
high=h-var low=l-var / <options>;
histogram var / <options>;
[hv]line var / <response=r-var> <stat=stat>
<options>;
inset inset-text / <options>;
keylegend names / <options>;
loess y=y-var x=x-var / <options>;
needle y=y-var x=x-var / <options>;
pbspline y=y-var x=x-var / <options>;
refline value / axis=x|y <options>;
reg y=y-var x=x-var / <group=g-var>
<degree=d> <options>;
scatter y=y-var x=x-var / <options>;
series y=y-var x=x-var / <options>;
step y=y-var x=x-var / <options>;
styleattrs options;
symbolchar name=identifier
char='hex-string' | keyword / <options>;
symbolimage name=identifier
image='file' / <options>;
text y=y-var x=x-var text=t-var / <options>;
vector y=y-var x=x-var / <options>;
waterfall category=c-var
response=r-var / <options>;
[xy]axis<2> options;
run;
```

## PROC SGSCATTER

PROC SGSCATTER creates a rectangular display of graphs.

```
proc sgscatter <options>;
compare y=y-var-list x=x-var-list / <options>;
matrix var-list / <options>;
plot y-var * x-var / <options>;
run;
```

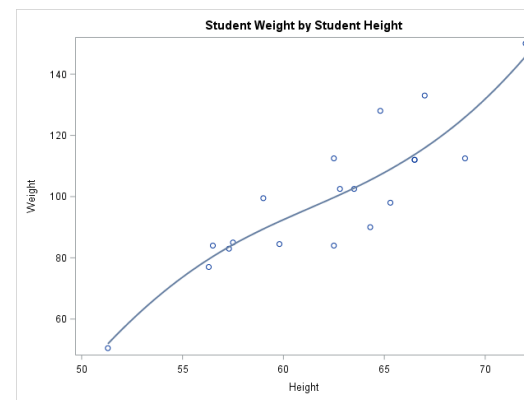
## PROC SGPANEL

PROC SGPANEL creates a matrix of graphs, with one graph for each combination of levels of a list of classification variables.

```
proc sgpanel <options>;
panelby var-list / <options>;
many-proc-sgplot-statements
run;
```

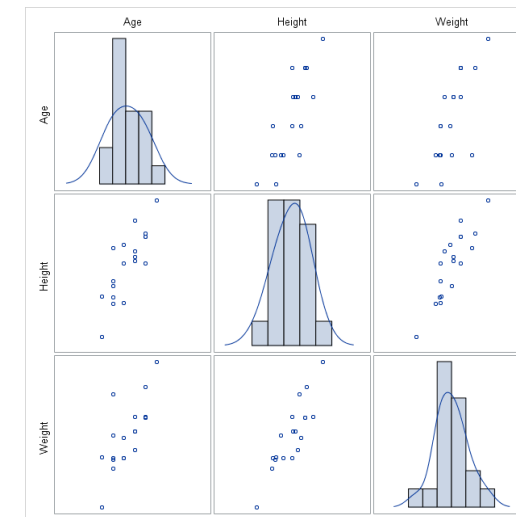
## SG Procedure Examples

```
title 'Student Weight by Student Height';
proc sgplot data=sashelp.class noautolegend;
pbspline y=weight x=height;
run;
```



## SG Procedure Examples

```
proc sgscatter data=sashelp.class;
matrix _numeric_ /
diagonal=(kernel histogram);
run;
```



```
title 'Cars by Make';
proc sgpanel data=sashelp.cars;
panelby make / rows=2 columns=3;
scatter x=mpg_city y=mpg_highway;
run;
```

