SG Procedure Notes

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

Statistical Graphics procedures do not use:
- SAS/GRAPH AXIS, LEGEND, NOTE, SYMBOL, PATTERN, or 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 and the LISTING destination, view your graphs from the Results window by double-clicking the graph icons. Graphs are displayed in the default viewer that is configured on your computer.

Output Destinations

Use ODS statements to open and close destinations:

```plaintext
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:

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

**PLOTS= Option**

Each statistical procedure that supports ODS Graphics has a PLOTS= option that is used 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. Syntax:

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

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

Examples:

```plaintext
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:
support.sas.com/publishing/authors/kuhfeld.html

For complete information, see the SAS® 9.2 documentation at http://support.sas.com/v9doc

ODS Graphics Tip Sheet

This tip sheet presents the most common procedures, statements, and options used in creating graphs with ODS Graphics and SAS 9.2.
**ODS Graphics Overview**

You can enable ODS Graphics by specifying the following statement:

```sas
ods graphics on;
```

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

```sas
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.
- A style template is a program that sets colors, fonts, and overall appearance.

**Example Statements and Options**

```sas
ods trace output notes; /* trace output in log */
ods graphics on /* enable ODS Graphics */
reset=all /* reset all options */
antialias=on /* cleaner edges, default */
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 & images path */
(url=none) /* all can move together */
file='sasoutput.html' /* file name for HTML */
image_dpi=300 /* image dots per inch */
style=statistical /* 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 with a variety of plot and chart types.

```sas
proc sgplot < options >;
  band x=x-var upper=u-var lower=l-var / < options >;
  density var / <type=type> < options >;
  dot var / <response=r-var> <stat=stat> < options >;
  ellipse y=y-var x=x-var / < options >;
  hbar var / <response=r-var> <stat=stat> < options >;
  hbox var / <category=c-var> < options >;
  histogram var / < options >;
  hline 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 >;
  pspline y=y-var x=x-var / < options >;
  refline value / axis=x < 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 >;
  vbar var / response=r-var stat=stat / < options >;
  vbox var / <category=c-var> < options >;
  vline var / <response=r-var> <stat=stat> < options >;
  xaxis options;
  xaxis2 options;
  yaxis options;
  yaxis2 options;
run;
```

**PROC SGSCATTER**

PROC SGSCATTER creates a rectangular display of graphs.

```sas
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.

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

**SG Procedure Examples**

**PROC SGSCATTER**

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

**PROC SGPANEL**

```sas
proc sgpanel data=sashelp.cars;
  panelby make / rows=2 columns=3;
run;
```

**Example Graphs**

- **Cars by Make**
- **Student Weight by Student Height**

**Output Display**

- **Cars by Make**
  - Make = Audi
  - Make = BMW
  - Make = Cadillac
  - Make = Chrysler

- **Student Weight by Student Height**
  - Weight
  - Height

- **Cars by Make**
  - Make = Audi
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