

# Changes in SAS 9.2 SAS/GRAPH® Software

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There are many changes in SAS/GRAPH software for SAS 9.2, and we hope you will love them all! If you are a SAS/GRAPH power user and have written SAS programs with graphical output that is already exactly the way you like it, some of your graphs might have a new look in SAS 9.2. The purpose of this paper is to help you understand the changes so that you can make informed decisions as to which of the changes you would like to embrace, and which you might want to override.

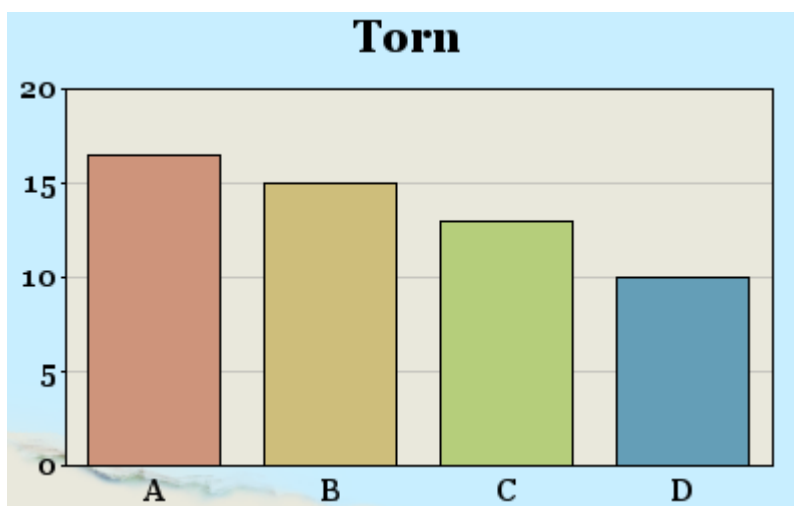
Note: This paper does not cover all the changes and enhancements in SAS 9.2 SAS/GRAPH, only those that might cause the output from your existing SAS/GRAPH programs to change. The examples in this paper were intentionally crafted to trigger the SAS 9.2 changes and differences in the most extreme way, so that you can easily see the differences. You should not see changes quite this dramatic in your output.

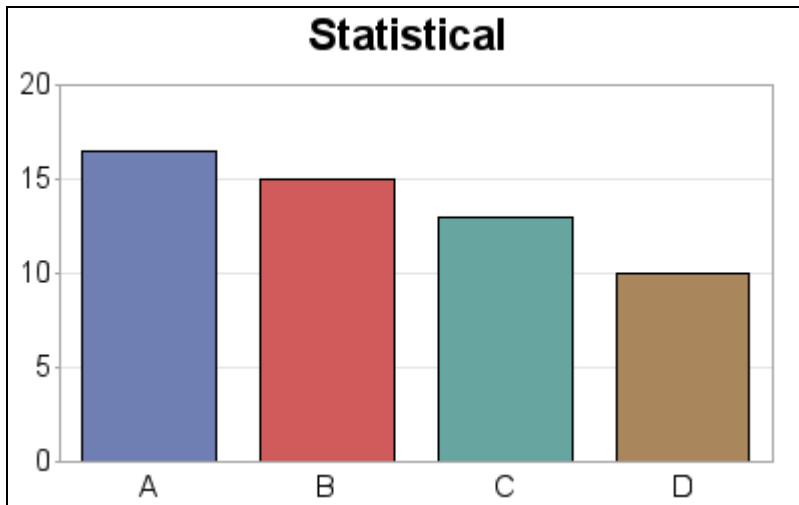
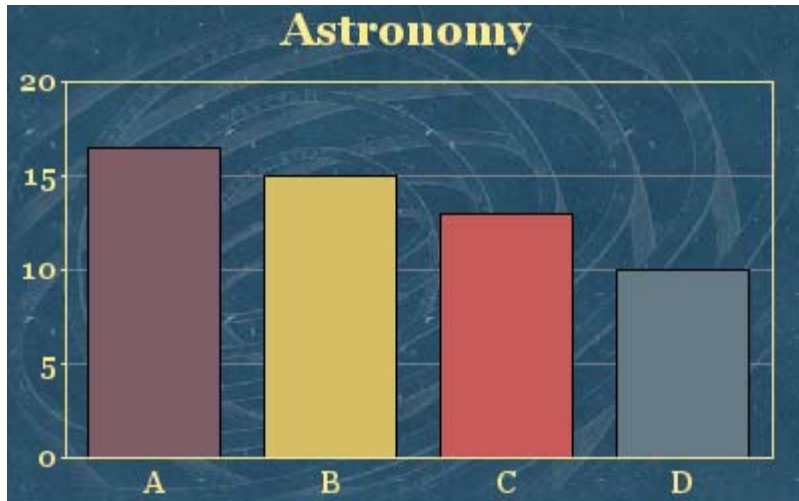
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## Graph Styles

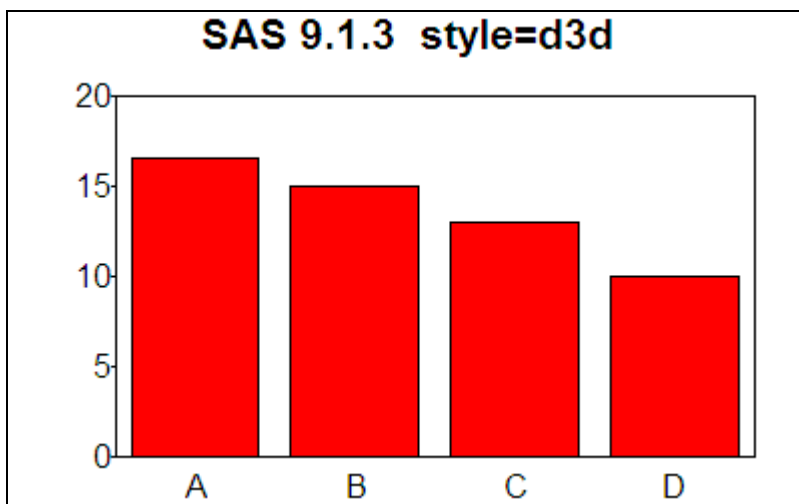
Prior to SAS 9.2, SAS/GRAPH devices such as GIF and PNG only supported the ODS border around the graphs for the graph styles; the graph styles did not affect the text, colors, or the 'look' of the graph. Styles only changed the look of graphs generated with the ACTIVEX and JAVA SAS/GRAPH device drivers. In SAS 9.2, all device drivers now support the SAS/GRAPH styles, including GIF and PNG. Graphics output that writes to the ODS LISTING or ODS HTML destination uses Styles.Default as its default style. Graphics output that writes to the ODS RTF destination uses Styles.RTF as its default style. Graphics output that writes to the ODS PDF destination uses Styles.Printer as its default style.

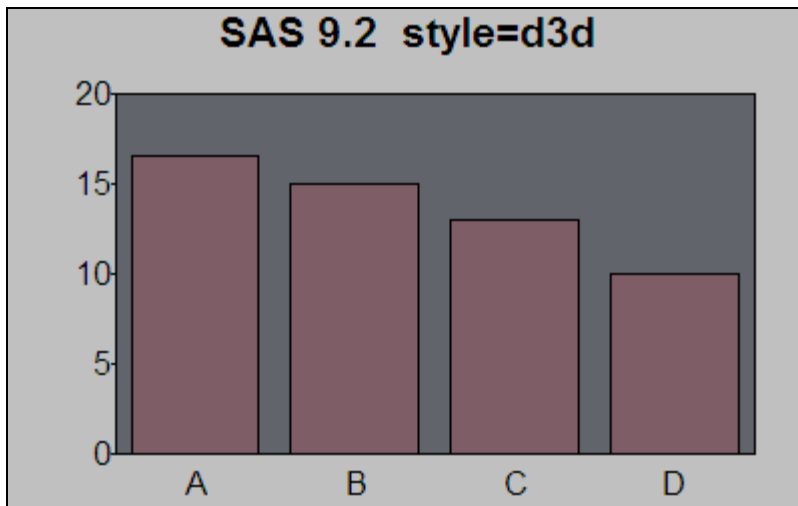
The new SAS/GRAPH styles (such as Torn, Astronomy, Seaside, Meadow, Banker, and Watercolor) are an easy way to choose pleasing color combinations for the background, the text, the axes, and the chart elements (such as bars, plot lines, and map areas) on your graph. They also control the font of the text, and some include a decorative background image. Below are some examples of graphs generated in SAS 9.2 using various styles with the PNG device driver. The name of the style is in the title of the graph.





Even the 'old' styles, such as D3D, Brick, and Minimal, which only affected the HTML border around the GIF and PNG graphs prior to SAS 9.2, now affect the default chart colors in SAS 9.2.





You can obtain a complete list of all the ODS graph styles by submitting the following SAS code:

```
PROC TEMPLATE;
  LIST STYLES;
RUN;
```

The list of styles will be written to the Listing destination (Output window).

If you have specified graphics options using a GOPTIONS statement, and/or various procedure options in your SAS program, then those specific options will override the graph styles, and those aspects of your graphs will look the same as they did prior to SAS 9.2. For example, the FTITLE= and FTEXT= graphics options override the style's font. The CBACK= graphics option overrides the background color. The COUTLINE= option in PROC GCHART and PROC GMAP overrides the style's outline color for the bars and map areas. The CFRAME= option in PROC GPLOT overrides the style's frame color (inside the axes). SYMBOL and PATTERN statements override the style's default colors for bars, lines, and map areas. You can also specify the IBACK= graphics option to override the style's background image.

To override the overall default use of styles in SAS 9.2, specify the following to remove the styles and revert to pre-SAS 9.2 behavior:

```
OPTIONS NOGSTYLE;
```

## Default Graph Device with ODS HTML

If you created a graph using ODS HTML prior to SAS 9.2, writing the results to a file, the GIF device driver was used by default. In SAS 9.2, the new default device driver is PNG. The results should look very similar; however, if you have scripts or URLs that refer to the .GIF file name, you will need to change them to point to the .PNG file name instead.

To override this change, you can use the GIF device driver rather than taking the new PNG default by specifying the following:

```
GOPTIONS DEVICE=GIF;
```

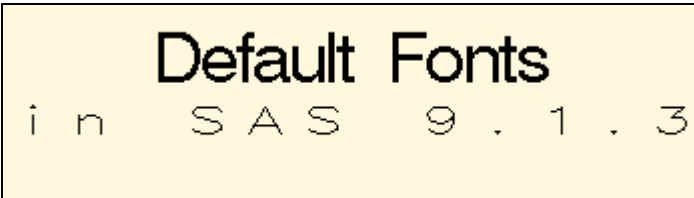
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## Graph Fonts

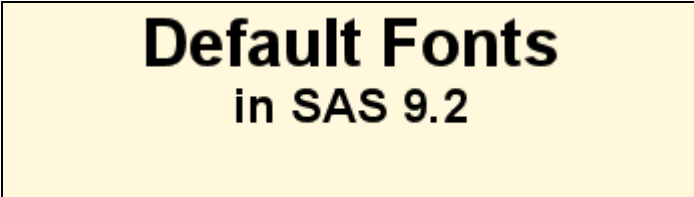
SAS/GRAPH software fonts were used as the default font on graphs prior to SAS 9.2. For SAS 9.2, SAS bought redistribution rights for several attractive fonts from the font foundry called 'Monotype Imaging'. The new fonts should make it much easier to produce higher quality graphs on UNIX and Mainframe systems, and also make it easier to reuse the same SAS code on Windows, UNIX, and Mainframes, without having to change the font. The Albany AMT font is used as the default font for graphs in most cases in SAS 9.2. This font looks very similar to the Windows Arial font.

To override this change, you can use the SAS/GRAPH software fonts via the GOPTIONS statement, such as:

```
GOPTIONS FTITLE=SWISS FTEXT=SIMPLEX;
```



**Default Fonts**  
in SAS 9.1.3



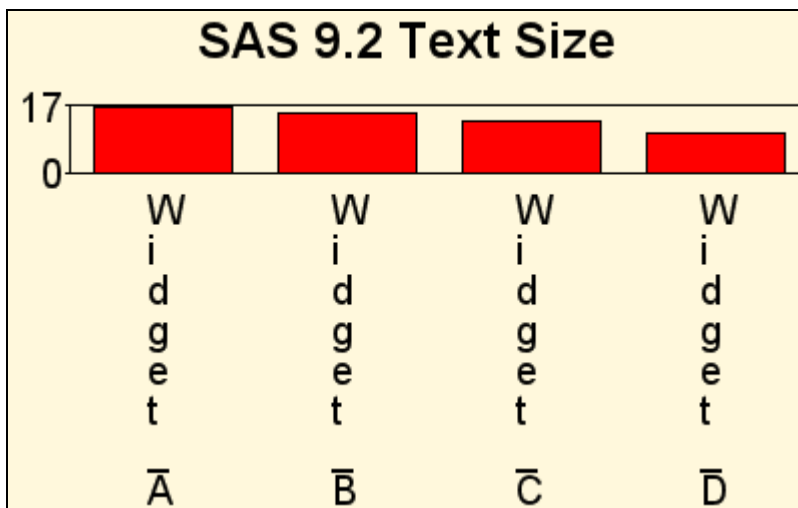
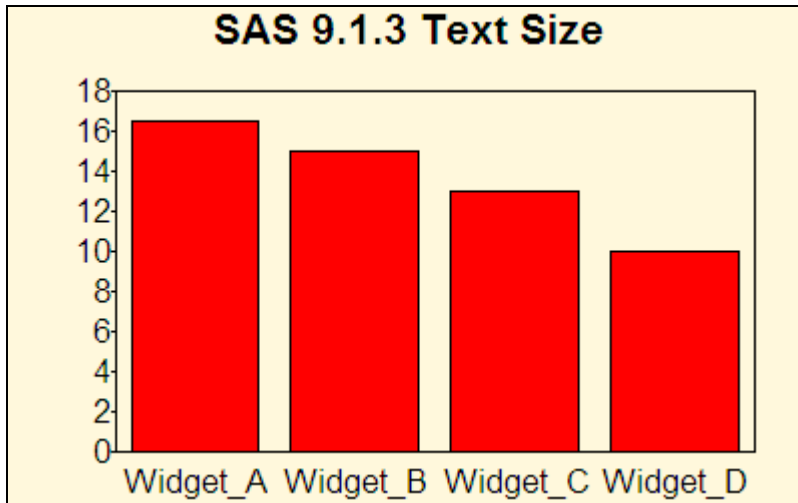
**Default Fonts**  
**in SAS 9.2**

In conjunction with the new default fonts in SAS 9.2, the default font rendering technique has also changed from Host font rendering to Freetype font rendering. While making this change, developers also fixed a bug that had previously caused fonts to render slightly smaller than the specified font size. Now in SAS 9.2, the fonts are rendered in the correct size, which is slightly larger than in prior releases. If the spacing of the text in your graphs is very tight (especially in bar charts), this change might cause the axis text values to no longer fit in SAS 9.2, and they might auto-rotate, as shown in the example below.

You can specify the following OPTIONS statement, along with using the GIF device driver on a GOPTIONS statement, to override this change and render the text in the same size it was prior to SAS 9.2:

```
OPTIONS FONTRENDERING=HOST_PIXELS;
```

You can also use the ZGIF device driver on a GOPTIONS statement, which automatically uses FONTRENDERING=HOST\_PIXELS.



Prior to SAS 9.2, when 'host font rendering' was the default, if you installed additional fonts on your PC after SAS Software was installed, you could automatically use those fonts in SAS/GRAPH. However, since Freetype font rendering is the default in SAS 9.2, if you install fonts on your PC after SAS is installed, you will have to manually "register" these fonts into the SAS registry by running PROC FONTREG before using them with SAS/GRAPH. For example:

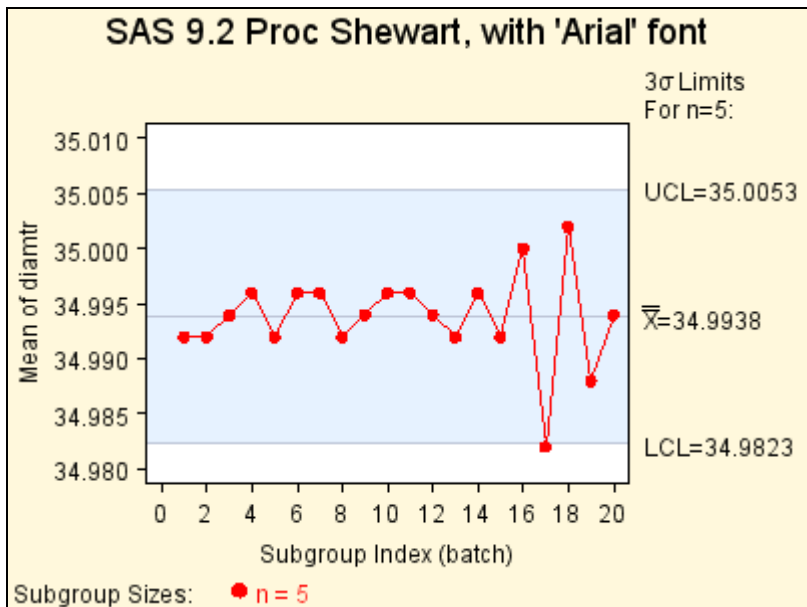
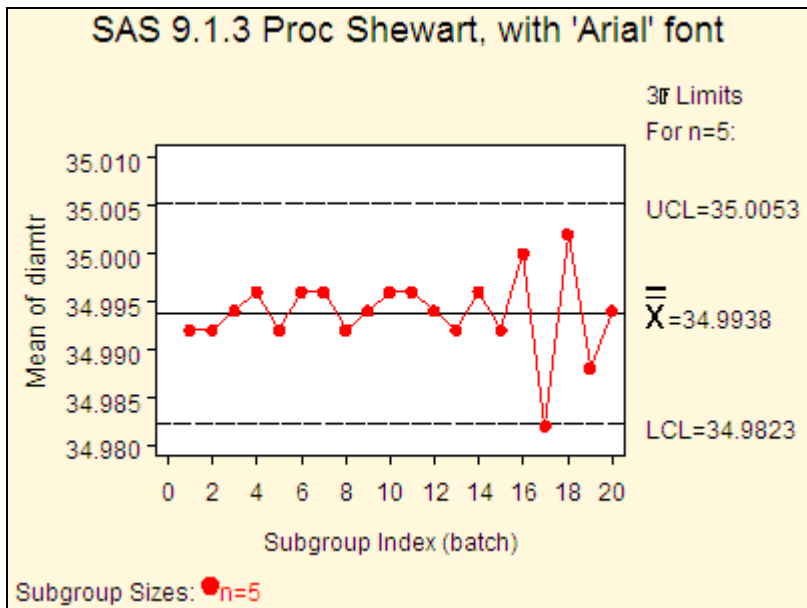
```
PROC FONTREG;
  FONTPATH "C:\WINNT\Fonts";
RUN;
```

To override this change, you can specify the following to get the pre-SAS 9.2 behavior:

```
OPTIONS FONTRENDERING=HOST_PIXELS;
```

The new SAS 9.2 fonts also help to improve the output for some non-SAS/GRAPH procedures that use SAS/GRAPH technology to draw graphs. For example, in SAS 9.1.3, PROC SHEWHART required you to use the SAS/GRAPH software fonts in order to display statistical characters, such as 'sigma', on the graph correctly. If you specified a nice, smooth-edged font such as Arial, then the sigma character (near the top right of the graph below) did not look smooth. With the new fonts in SAS 9.2, the special statistical characters should

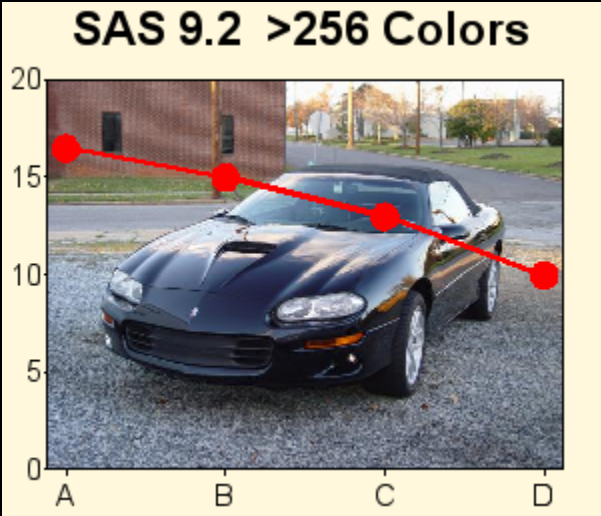
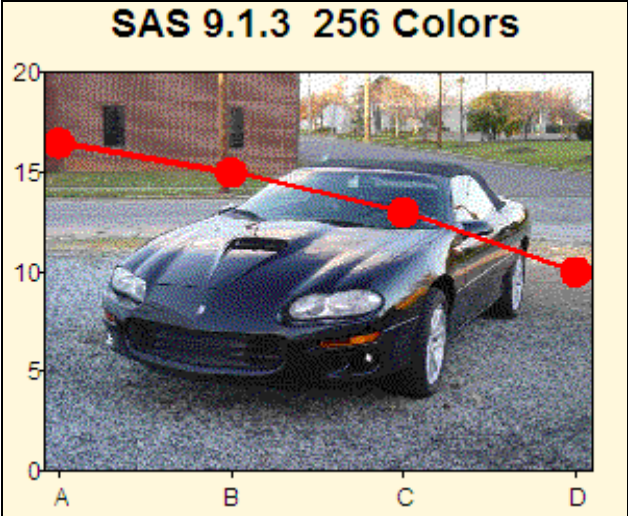
always look good, no matter which font you specify. This enhancement will greatly help in producing publication-quality output from these procedures.



## Color Support

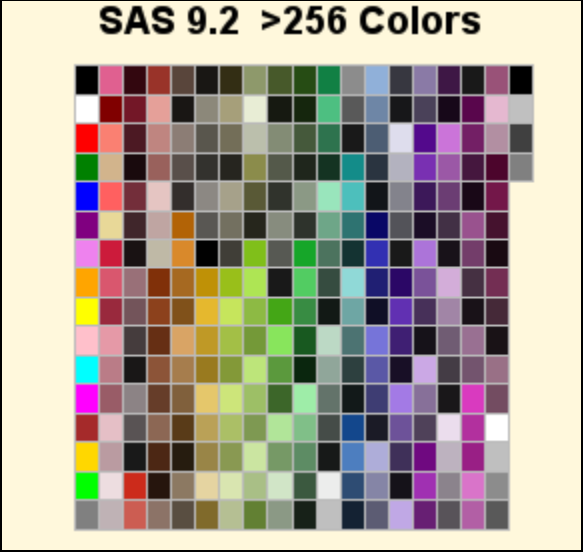
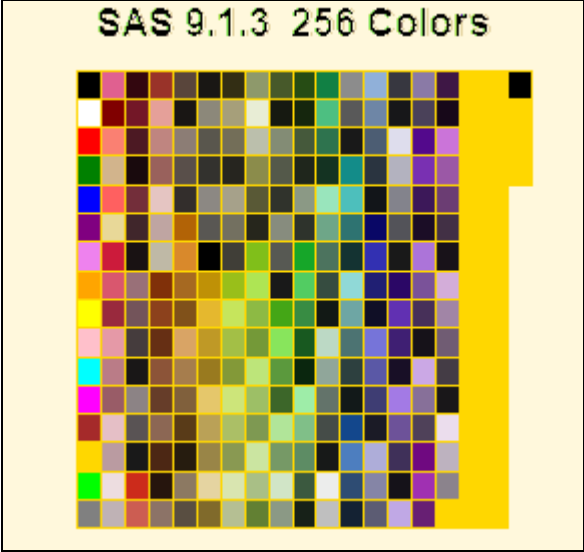
In SAS 9.2, SAS/GRAPH has been enhanced to support over 16 million colors! SAS/GRAPH had a limit of 256 colors prior to SAS 9.2. This is a very exciting change which will have a profound impact on the quality of your graphics output. This increase in colors is only supported in certain SAS/GRAPH device drivers, such as PNG. The GIF device driver, for example, will never support more than 256 colors in SAS/GRAPH because the GIF standard itself does not support more than 256 colors.

With more colors, your output can look better because more color shades are available for better text anti-aliasing (edge smoothing), and when images or photos are incorporated into graphs, they have a more true, undithered look, as demonstrated by the examples below:



If you need your output to be exactly like it was in SAS 9.1.3, or if you want to limit yourself to 256 colors, you can use the GIF device driver rather than taking the new PNG default for SAS 9.2.

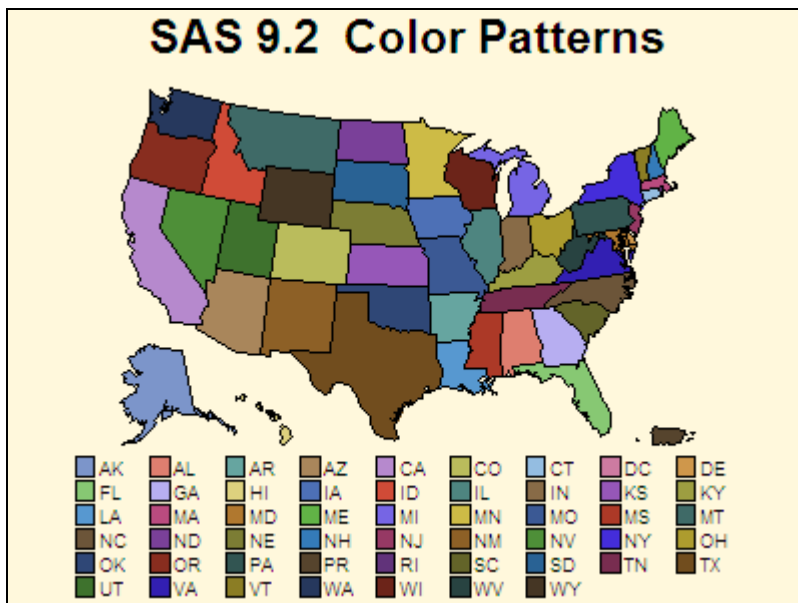
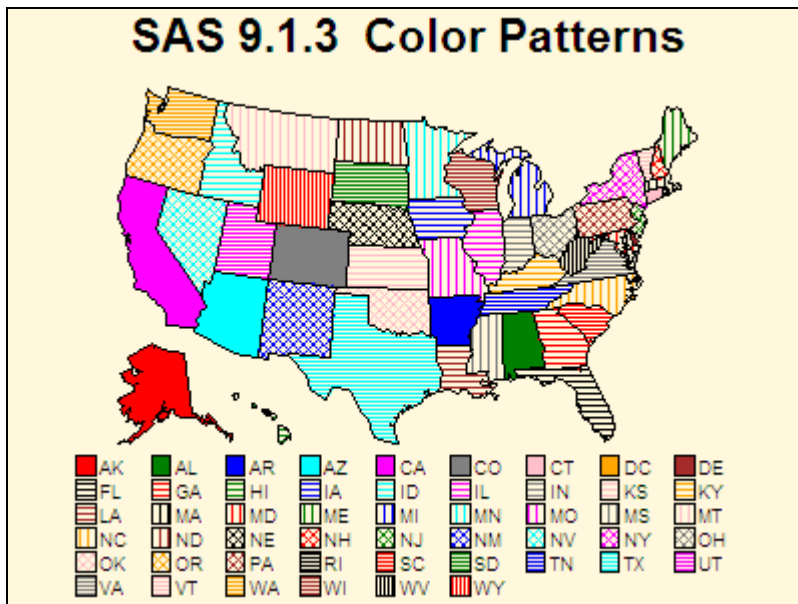
Also, when SAS/GRAPH only supported 256 colors, it was unable to display all of the 292 "named" SAS/GRAPH colors, as demonstrated in the first graph (left) below. After it ran out of colors in SAS 9.1.3, SAS/GRAPH used dark yellow for the additional color swatches and the outlines around the annotated color rectangles (in this particular example), and the anti-aliasing around the edges of the title text looks unclear. In SAS 9.2, all 292 named SAS/GRAPH colors can be displayed in a single graph, and the anti-aliasing around the title text looks much crisper.



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## Pattern Colors

Prior to SAS 9.2, if you did not specify colors in your PATTERN statements, the default color list was used. After the color list was exhausted, the same colors were reused with various crosshatch patterns. In SAS 9.2 with the new graph styles, the default color lists are much longer, and generally contain non-primary colors. Once the color list has been exhausted in SAS 9.2, the various shades of the color list are used rather than crosshatch patterns of the same colors. The specific colors vary, depending on which graph style is being used.



You can override the new SAS 9.2 default pattern colors by specifying PATTERN statements with a color and pattern.



To override the overall default use of styles in SAS 9.2, specify the following to remove the style and revert to pre-SAS 9.2 behavior:

```
OPTIONS NOGSTYLE;
```

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## Long File Names

The NAME= option for SAS/GRAPH procedures has been enhanced to allow you to specify file names up to 256 characters in length for graphics output files such as GIF or PNG. The previous limit was eight characters.

Using name='some\_long\_name' in SAS 9.1.3  
some\_lon.gif

Using name='some\_long\_name' in SAS 9.2  
some\_long\_name.gif

Your existing SAS/GRAPH programs will not be affected by this change, unless you were previously specifying names longer than eight characters (which were being truncated - and in SAS 9.2 they will not be truncated). In this scenario, if you had scripts or URLs that referred to the GIF output file by name, then you will need to update them to refer to the longer name.

The NAME= option also allows the use of #BYVAL in the name, which now allows you to use values from the data to easily produce longer, more meaningful file names when using a BY statement.

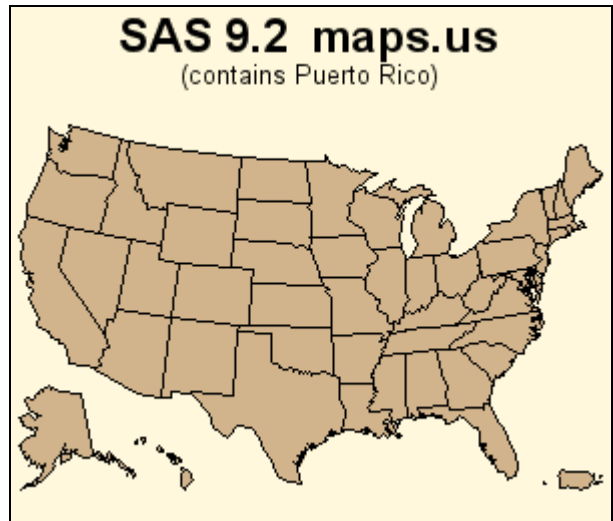
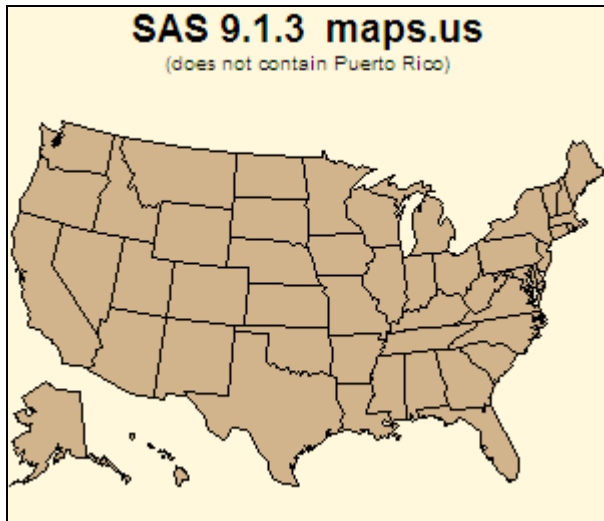
In a related issue, in SAS 9.2, the GRSEG name is still limited to eight characters. Therefore, if you specify a NAME= longer than eight characters, the GRSEG and the file name will no longer match. This is not likely to cause problems for your existing SAS/GRAPH programs, but it could cause some confusion for the programmer who was accustomed to seeing the names match in previous releases of SAS.

There is no method available in SAS 9.2 to return to the earlier file name truncation behavior.

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## MAPS.US now includes Puerto Rico

In previous releases of SAS Software, the MAPS.US map data set only contained the 50 states of the United States, along with Washington DC. In SAS 9.2, Puerto Rico is included in the MAPS.US map data set. This can affect your pre-existing programs in several ways. For example, if you were shading all 50 states plus Washington DC by specifying REPEAT=51 in a PATTERN statement, you now have 52 map areas rather than 51. Also, if you were generating a map of the continental US by excluding Alaska and Hawaii, you now need to also exclude Puerto Rico.



To use the new SAS 9.2 MAPS.US map data set and exclude Puerto Rico, use code similar to the following in your PROC GMAP statement:

```
PROC GMAP MAP=MAPS.US(WHERE=(STATE NE STFIPS('PR'))) DATA=response_data_set;
```

If you want your programs to run exactly like they used to without having to modify your code, you will need to replace the SAS 9.2 MAPS.US with the SAS 9.1.3 MAPS.US data set (the file name is US.SAS7BDAT).

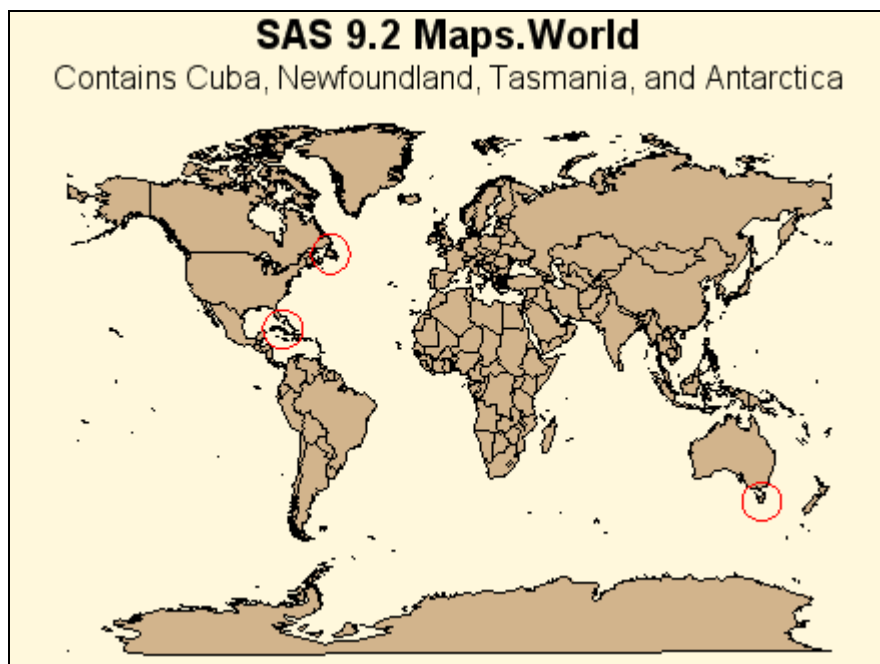
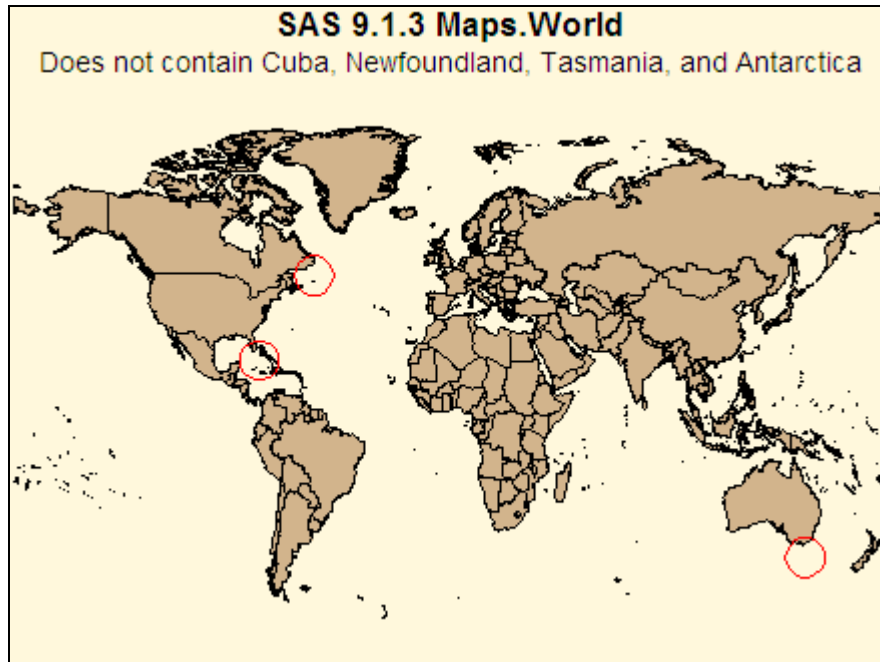
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## MAPS.WORLD Changes

There have been several changes to the MAPS.WORLD map data set. For example, Cuba, Newfoundland, Tasmania, and Antarctica have been added to the map. The addition of Cuba, Newfoundland, and Tasmania should not cause any problems for your existing SAS/GRAPH programs, but the addition of Antarctica will change the look and spacing of your map. If you want to use the new SAS 9.2 MAPS.WORLD map but exclude Antarctica, you can exclude it with a WHERE statement, such as in the following example:

```
DATA WORLD;  
  SET MAPS.WORLD;  
  WHERE CONT NE 97;  
RUN;
```

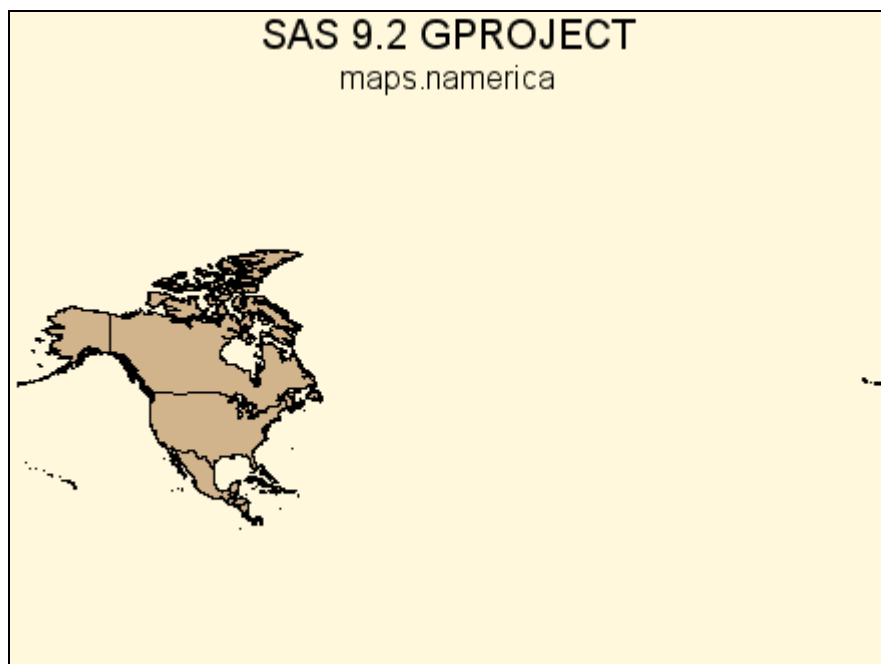
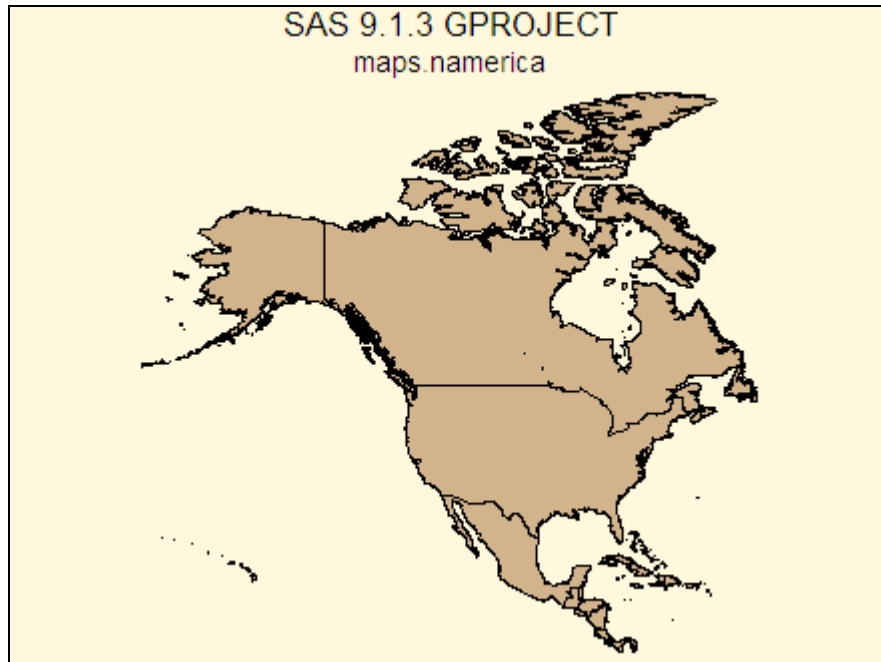
You can also use the SAS 9.1.3 WORLD.SAS7BDAT data set in SAS 9.2 so that your map will look exactly as it did prior to SAS 9.2.



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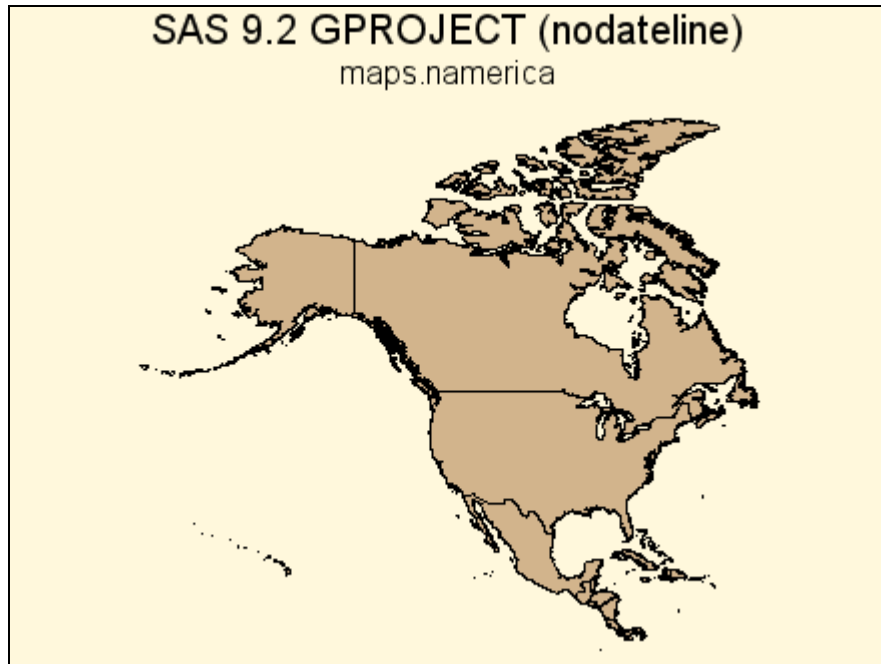
## PROC GPROJECT Changes

There have been some changes to PROC GPROJECT, and also to the maps themselves, that might cause some of your maps to look different in SAS 9.2. In particular, maps that cross the international dateline will be affected. The examples below show the differences in MAPS.NAMERICA (North America) between SAS 9.1.3 and SAS 9.2:



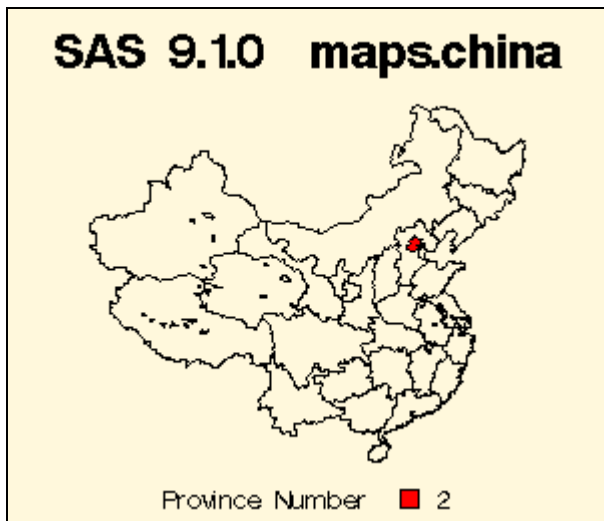
To return to the SAS 9.1.3 behavior, you will need to specify the new NODATELINE option in PROC GPROJECT in your SAS 9.2 programs, as in the following example:

```
PROC GPROJECT DATA=MAPS.NAMERICA OUT=NEWMAP NODATELINE;  
  ID CONT ID;  
RUN;
```



### Other Map Data Set Changes

There have been several other changes to various SAS/GRAPH map data sets in SAS 9.2 that might cause some of your maps to look different. For example, there are new province names and ID values in the MAPS.CHINA, MAPS.SPAIN, and MAPS.INDIA map data sets. In most cases, the old ID values were arbitrarily assigned, and the new ID values attempt to use international standards for the province numbers. This should make it much easier and more logical to associate your response data with map areas in your maps.



Please see the "What's New in SAS 9.2" section in the SAS/GRAPH documentation for a complete list of changes to all the map data sets.

You will need to check these lists for changes affecting the map data sets you use. Otherwise, when you run your existing SAS/GRAPH programs at SAS 9.2, the output could be incorrect. For example, if the ID values change and correspond to different areas in SAS 9.2, the data, colors, patterns, or bars will be showing up on a different map area. To guarantee that your programs will run the same in SAS 9.2 as they did before, you will need to use the SAS 9.1.3 maps, or modify your SAS programs and/or response data to correspond with the ID values in the new map data sets.

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