

## Graphs In a Minute

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### ABSTRACT

Software from SAS Institute provides multiple ways of producing attractive graphics quickly using simple and intuitive user interfaces. This paper focuses on the Graph-N-Go® application in Version 8.0 of The SAS® System and the Graph tasks in Enterprise Guide™ Version 1.0. Using the point-and-click interfaces of these applications, you can visualize data quickly using a variety of chart and plot types and include your results into your documents and reports.

### INTRODUCTION

In the past, it was necessary to write code to access the power of SAS/GRAPH® procedures like GCHART, GMAP, or GPLOT, but now much of the functionality in those procedures can be obtained through intuitive point-and-click interfaces. In Version 8.0 of the SAS System there are several ways of producing graphs quickly and easily. Because getting results is faster and easier, you can explore your data more readily and try alternative graphing techniques or chart types. Graphs are also more easily transferred to web pages or other documents than ever before—they can be exported in many image formats. Results can be interactive or “live” when they are created as web pages using the SAS/GRAPH® ActiveX® Control or Graph Applet.

In this paper the following three approaches are described for creating “graphs in a minute:”

- The Graph-N-Go Application
- Enterprise Guide Software
- Enterprise Reporter Version 2.5

### THE GRAPH-N-GO APPLICATION

Graph-N-Go is part of the SAS System Version 8.0 as part of SAS/GRAPH® software. You start the application by selecting **Solutions → Reporting → Graph-N-Go** from the pull-down menus of any SAS window. You then see the Graph-N-Go window, as shown in Figure 1, which contains two sub-windows, or work areas, both of which are initially empty. The upper window will contain icons representing data models you can use for graphs, and the lower window will contain the graphs that you create.

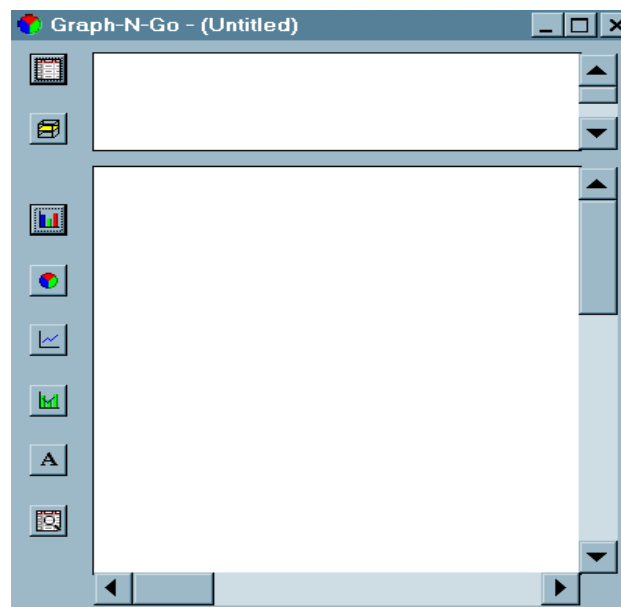


Figure 1. Layout of Graph-N-Go Window.

There are four steps in creating a graph in Graph-N-Go:

1. Getting a data model.
2. Setting up a graph to display the data.
3. Customizing the appearance of the graph.
4. Saving the results.

#### GETTING A DATA MODEL

You select data for graphing by clicking on the dataset icon to the left of the upper work area in the Graph-N-Go window. From the selector, you can choose data in an existing SAS library or define a new SAS library for data sets that exist on your computer. When you have selected a dataset, an icon representing it will be shown in the upper work area.

#### PICK A CHART TYPE

There are three icons on the left side of the Graph-N-Go window that represent different chart types: Bar, Pie, and Plots. To create a chart, select one of the icons and drag the outline rectangle that appears to the location in the work area where you would like to show the graph. The chart will appear with default data. You can select the chart by clicking on it and then use the handles around the outline of the graph to grow or shrink the graph to the desired size.

Next, you associate the data model with the graph by dragging from the data model icon to the graph. The graph will choose variables from the data to display, but they may not be the variables you intend. You can change them using the properties dialog which is accessed by clicking with the right mouse button to bring up the popup menu and then selecting **Properties**. Use the **Data** tab on the dialog to set the Column Roles. Figure 3 shows how the properties dialog looks when charting sales for each department from the SASUSER.TOTALS data set in a pie chart.

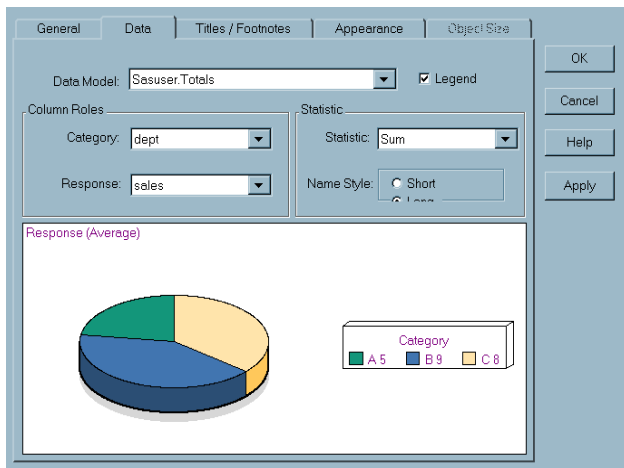


Figure 2. Property Sheet for setting Column Roles in Graph-N-Go

### MODIFY THE APPEARANCE OF THE CHART

After the data model columns are assigned to the chart, you can modify the appearance of the chart to suite your tastes. Using the property sheet you can add titles and footnotes, change colors, legend, and other visual properties. You can also add additional charts and data models to the work area if you need multiple charts for comparison. A sample result is shown in Figure 3.

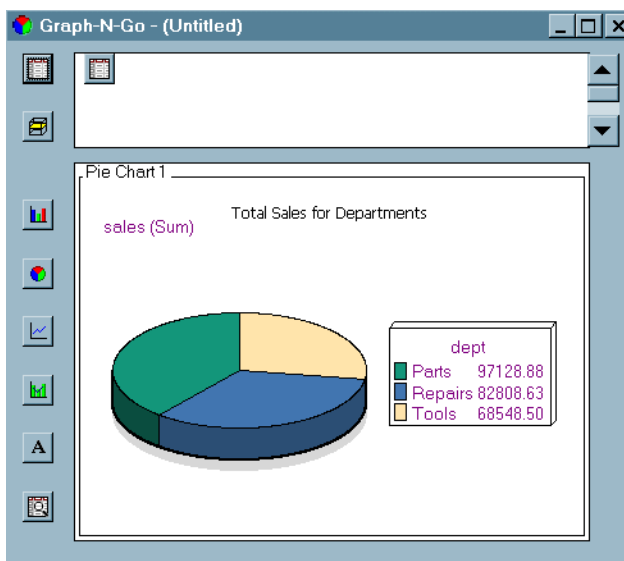


Figure 3. Resulting Pie chart in Graph-N-Go

If the appearance of the chart is suitable, you can print it from the Graph-N-Go window. You can also export it in a wide variety of image formats to a file and use the image in web pages or other documents. For example, we have inserted the image file (in this case a GIF format) into this paper, which was originally formatted as a Microsoft Word 97 document. The result is shown in Figure 4.

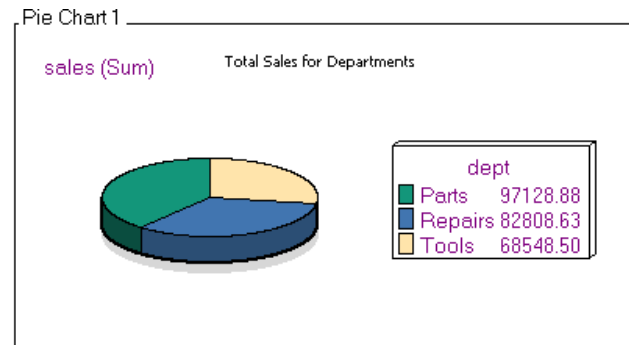


Figure 4. Image file inserted into document.

### YOU CAN EXPORT AND RUN SOURCE

Perhaps you would like to have a SAS/GRAPH program that can be used to recreate the graph. This is possible in Graph-N-Go by exporting the graph to a source file. To do this, use the right mouse button popup menu, select **Export** → **Source File**, and then specify the name of the file or SAS source catalog entry where you want to save the source code.

You can also generate the graph as a web page by exporting it to an HTML file, which you can view using a web browser. To do this, use the right mouse button popup menu and select **Export** → **HTML File**. You then specify one of three possible formats for the graph within the web page, either GIF, ActiveX Control, or Java Applet. In figure 5 the pie chart is about to be exported as an html file that will use the Java applet.

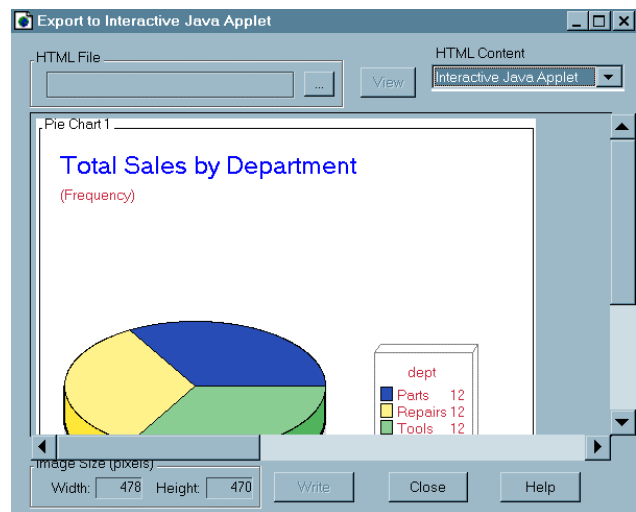


Figure 5. Exporting HTML content from Graph-N-Go.

From the dialog in figure 5 is possible to preview the resulting web page by selecting the **View** button. If the ActiveX Control or Java Applet is selected as the output format, the chart will be interactive in the web page, as shown in figure 6, in which the Java Applet's popup menus are being used. Use the Java Applet if you need your results to be portable *and* interactive. Use the ActiveX Control when the web page will be viewed only on Windows® using Internet Explorer.

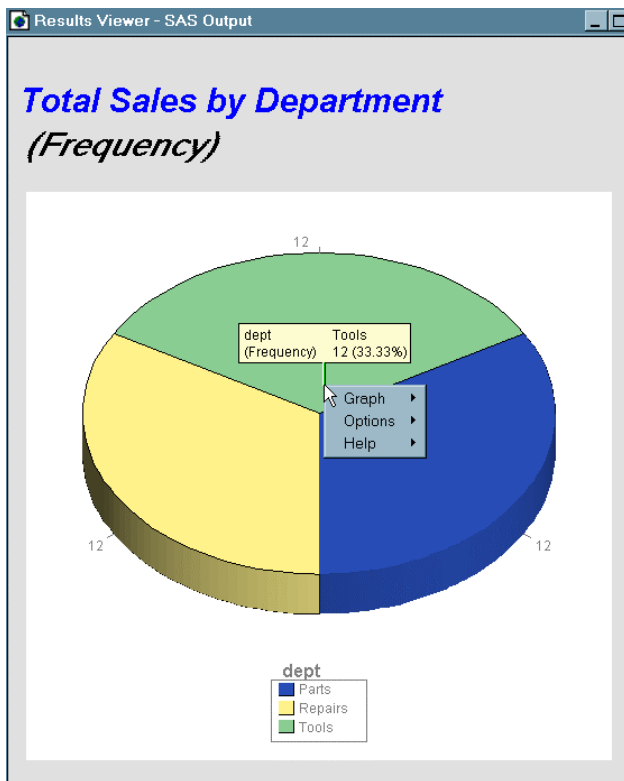


Figure 6. Interactive Java Applet results created by exporting to HTML file from Graph-N-Go.

## GRAPHS IN ENTERPRISE GUIDE

If you are using a computer running Windows® 95, 98, or NT 4.0, a powerful alternative for graphing is Enterprise Guide Version 1.0. It provides an intuitive Windows interface to the SAS System, including many of the capabilities of SAS/GRAPH software. Enterprise Guide is a separate product from the SAS System and is able to communicate with a SAS System server running on the local PC or on some other server on your network.

The first thing you do when starting up Enterprise Guide is create a project. (You can also open an existing project that you have saved previously.) In order to create a graph, you need data, so the next step is to insert a data set into the project. This is done by selecting **Insert->Data** from the main menu bar and then selecting a data set, as shown in figure six.

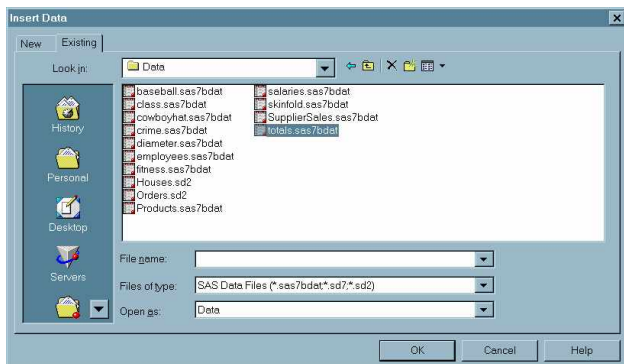


Figure 6. Inserting a data set into a project in Enterprise Guide.

To start creating a graph of your data, you select the **Graph→** option from the main menu, and then the type of graph you want (Bar, Pie, etc.) A dialog window leads you through the steps of defining the graph. Figure 7 shows the first tab of the dialog, which lets you choose from a gallery of various charts styles.

Here we select the 3D Colored Bars style.

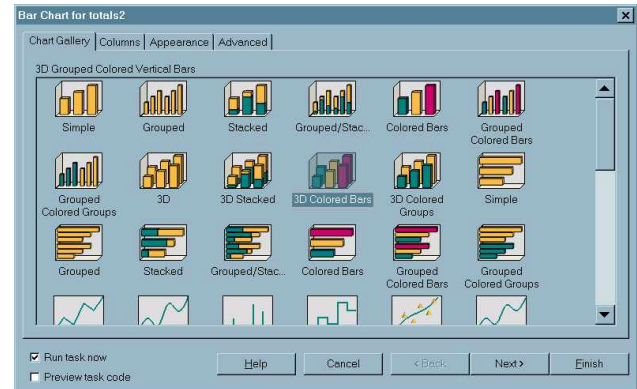


Figure 7. Chart Gallery in Enterprise Guide.

We select the **Next>** button to move to the **Columns** tab of the dialog, which is shown in figure 8. Here we define how the columns of data are assigned to the chart roles of the graph. We are going to make a bar chart that shows sales summarized by the variables **dept** and **site**. To assign the roles, we drag the icons representing the columns, and drop them on the roles.

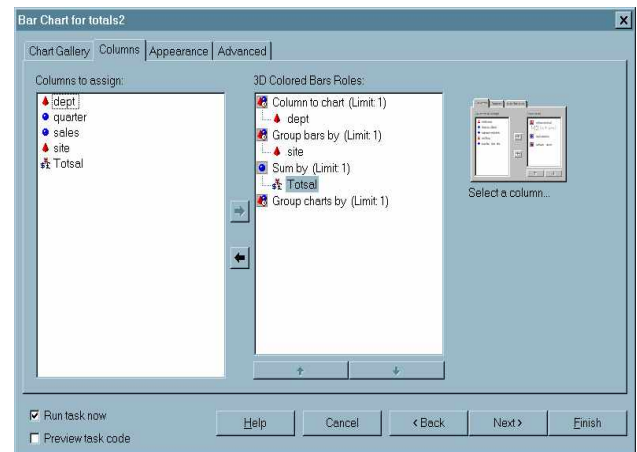


Figure 8. Assigning columns to charting roles in Enterprise Guide.

Selecting the **Next>** button takes us to the **Appearance** tab of the graph dialog, where we can modify a wide variety of options for the bar chart, titles and footnotes, legend, and axes.

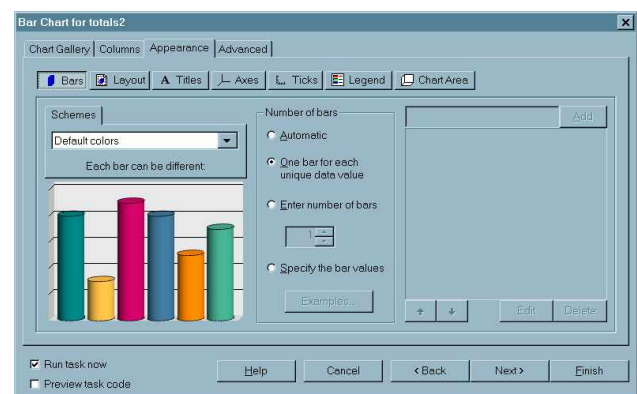


Figure 9. Setting appearance options for bar charts in Enterprise Guide.

When we select the **Finish** button, Enterprise Guide generates

code for SAS/GRAPH statements and procedures, submits the code to the SAS server, and displays the resulting output (which is in HTML format) in the Results window, as shown in figure 10.

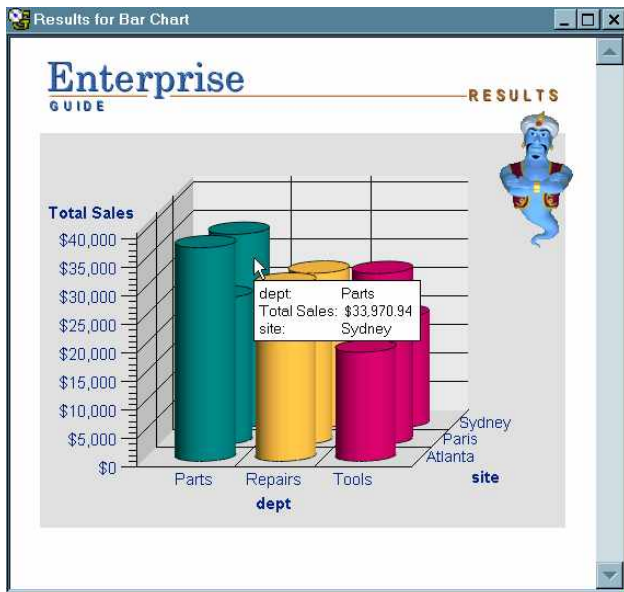


Figure 10. Riser chart in Enterprise Guide using ActiveX Control and showing interactive chart tips.

There are multiple output formats for graphs in Enterprise Guide, just as there are when exporting results to HTML in Graph-N-Go. The graph can be embedded in the output as GIF image, ActiveX Control, or Java Applet. The GIF image is a static picture on the page, and the ActiveX Control and Java Applet are interactive.

Enterprise Guide provides for a wide variety of charts and plots, covering much of the functionality of the GCHART, GPLOT, G3D, and GMAP procedures in SAS/GRAPH. Figures 11, 12, and 13 show results for a three-dimensional scatter plot with needles, a surface plot, and a prism map. Figure 11 shows only the results window and figures 12 and 13 show the results within main window of Enterprise Guide. Note that the output is interactive—the map is showing a “data tip” revealing the robbery value for Nevada as the cursor is moved over the state.

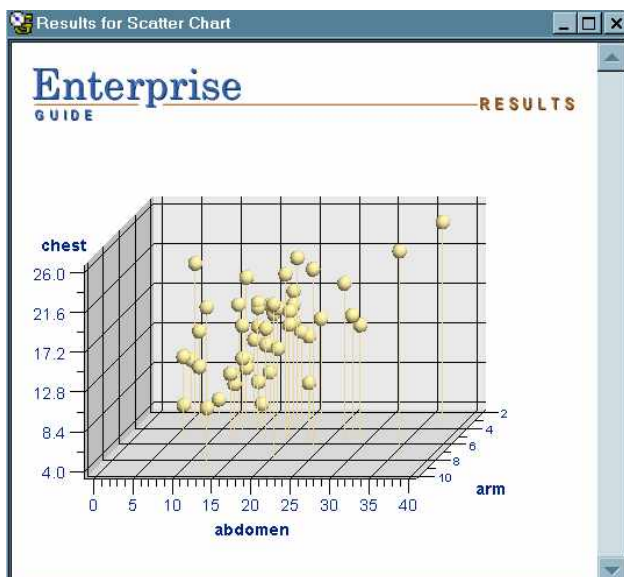


Figure 11. Three dimensional scatter plot in Enterprise Guide using ActiveX Control.

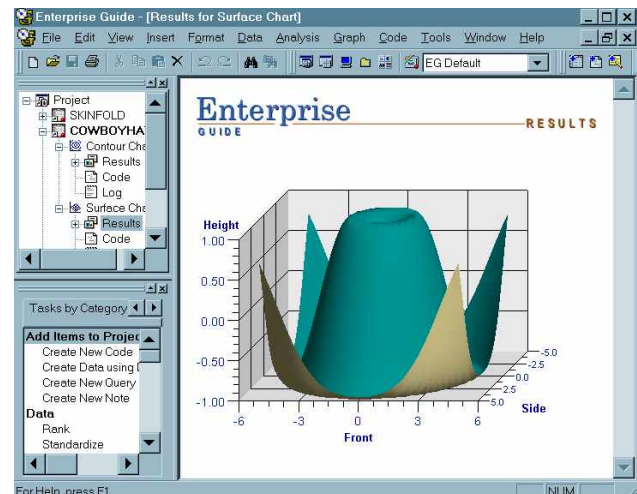


Figure 12. Surface chart results in Enterprise Guide.

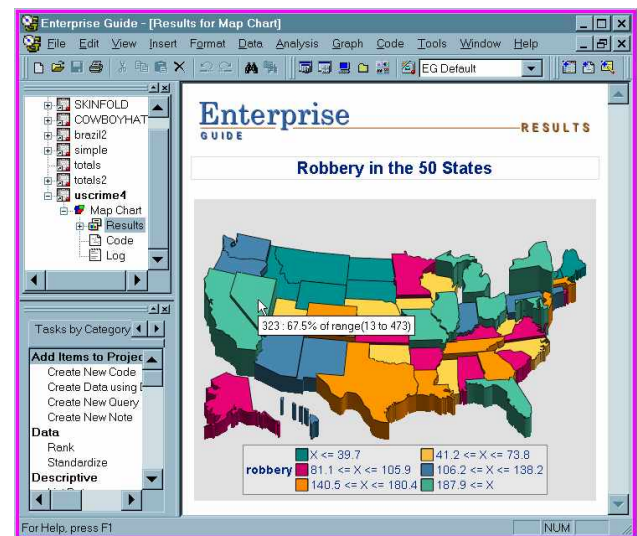


Figure 13. Prism map result in Enterprise Guide.

## COPYING ENTERPRISE GUIDE RESULTS TO DOCUMENTS

When you use the ActiveX Control in Enterprise Guide, you can copy the control from the Results Window to the clipboard and then paste into any document that can contain an ActiveX Control, such as Microsoft Word 97 documents, Excel® spreadsheets or Powerpoint® presentations.

You copy the graph to the clipboard by bringing up the popup menu using the right mouse button and selecting **File→Copy To Clipboard** as shown in figure 14. The resulting document has a live, interactive graph in it, as shown in figure 15.



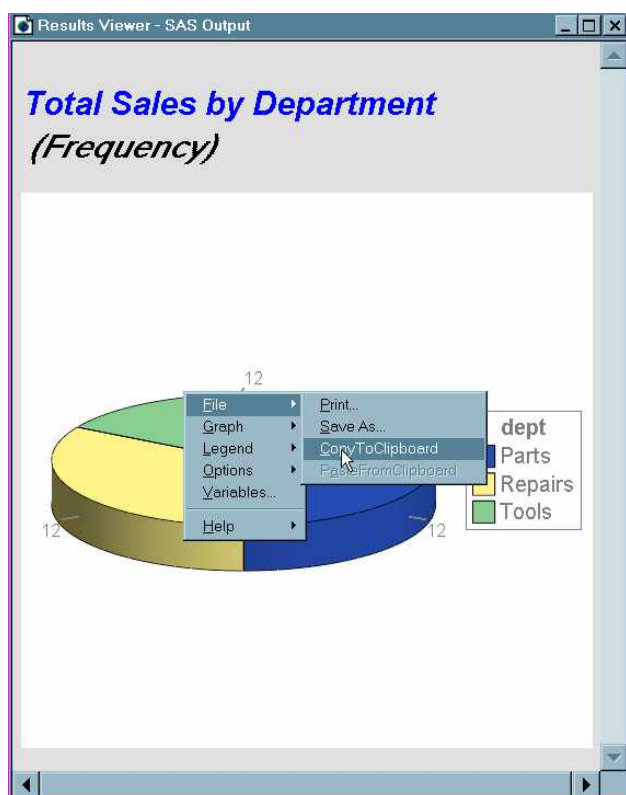


Figure 14. Copying the ActiveX Control to the clipboard.

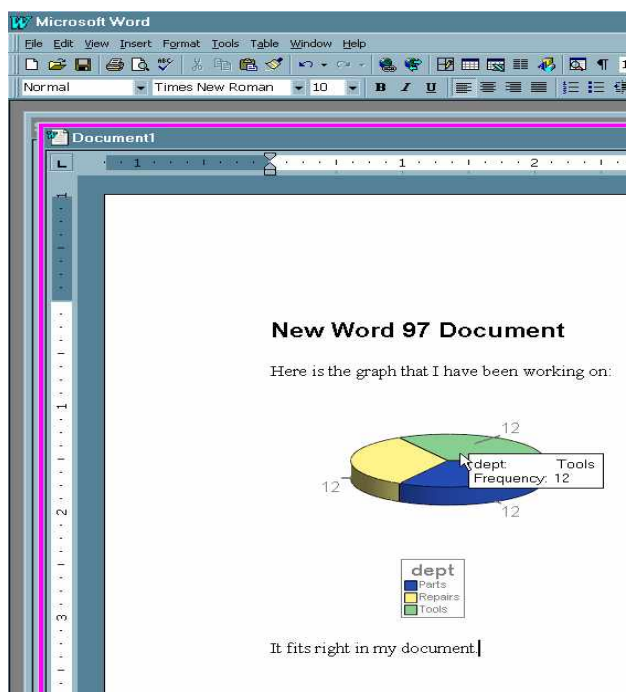


Figure 15. ActiveX Control embedded and active in Microsoft Word 97 document.

## ENTERPRISE REPORTER VERSION 2.5

For a more complete solution to reporting, you can use Enterprise Reporter Version 2.5, which brings new features for viewing and printing reports graphs on the PC. Enterprise Reporter is particularly helpful when you need printed output for reports, including tables and graphs, complete with pagination, headers and footers and "BY group" processing and summarization of data.

Enterprise Reporter® is a separate product from the SAS System. Version 2.5 includes the Windows-only Enterprise Report Viewer that uses the SAS/GRAPH ActiveX Control for its graphs. The Enterprise Report Viewer enhances the printing and print preview functionality of Enterprise Reporter. To view a report using Enterprise Report Viewer, you first create a the report in Enterprise Reporter, then use **Save As→** from the main menu to save the report as an external ".erx" file, and open the saved file using the Enterprise Report Viewer.

Complete information about Enterprise Reporter is not available at publication time for this article, but will be available at SUGI 25.

## CHOOSING THE RIGHT TOOL

This paper has presented several alternative approaches for creating graphs quickly. How do you choose the right alternative for your needs? Here is a table that will help you decide:

If you need:	Use this approach:
Interactive graphs on all platforms, including bar charts, pie charts, and plots.	Graph-N-Go
Interactive graphs on Windows 95, 98, or NT only, or graphs using a fuller set of SAS/GRAPH features, or graphs to embed in Microsoft Office documents.	Enterprise Guide
Printed output complete with pagination, headers, footers, and "BY" grouping	Enterprise Reporter Version 2.5 and the Enterprise Report Viewer for Windows.

## CONCLUSION

Creating graphs can be done using SAS/GRAPH software much more quickly and easily than in the past. It is no longer necessary to write code in order to produce great-looking graphs with SAS/GRAPH software. Using the portable Graph-N-Go application or Enterprise Guide software, you can quickly view your data graphically and use the results for web display or document output. Using Enterprise Reporter Version 2.5 and the new Enterprise Report Viewer for Windows, you can also produce full reports containing graphs.

## REFERENCES

For a more complete description of the capabilities of Graph-N-Go software, see the SUGI 25 paper number S70-25, "Painless Graphics: The Click, Drag and Drop approach of Graph-N-Go," by Jeff Cartier.

For more information about Enterprise Guide, see the SUGI 25 paper "Enterprise Guide, An Intelligent Client interface that provides access to all of the power of the SAS System," by Gail Kramer.

Further information about the SAS/GRAPH client graphs (the ActiveX® Control and Java Applet) can be found at <http://www.sas.com/rnd/webgraphs/intro.htm>

## **ACKNOWLEDGMENTS**

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