

A First Look At SAS® Software For Windows™

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Abstract

This paper provides an overview of some unique features available with SAS Software for Windows. Items covered include a benchmark comparison between SAS Software for OS/2 and Windows, the display manager work environment, the SAS Toolbox window, and DDE (Dynamic Data Exchange).

Benefits

SAS Software for the Windows operating system provides an opportunity for Windows users to take advantage of SAS Institute products in a familiar and friendly environment. SAS Software for Windows is useful when you need to switch between Windows applications or cut and paste information between a SAS display manager window and another Windows application. SAS Software for Windows also allows you to use Dynamic Data Exchange (DDE) to link to other DDE capable applications. This feature is useful for reading data held in non-SAS files.

Most options and menu functions in the AWS will be familiar if you have used the SAS Display Manager under other operating systems. Under Windows you can use the mouse to mark text and place the insertion point. If you are an experienced Windows user, be aware that the editor does not follow all Windows conventions for mouse events. For example, double clicking does not select the current word. Advanced text handling features like drag-and-drop are not available.

The AWS Options menu, shown in Figure 2, gives you access to several new features including DDE and font settings.

Benchmark versus OS/2

Performance is always an important issue to SAS System users. Normally, it is difficult to compare the performance of SAS Software across platforms because of the great differences in hardware types, peripherals, and system loads. With SAS Software for Windows, a realistic comparison

can be made with SAS Software for OS/2 running on the same computer.

A benchmark was run using a test stream of over 200 SAS steps adapted from the SAS Sample library.

System hardware for the comparison was a 33MHz 386 PC with 16MB of memory. The OS/2 setup consisted of OS/2 2.0 and SAS Software for OS/2 version 6.06. The Windows setup was Windows 3.1 under DOS 5.0. Win-

dows was run in 386 Enhanced mode with no swap file. SAS Software was version 6.08 Developer's Release Beta. The test stream was run three times on each system. There was less than a one-hundredth of one percent variation among runs within each system. Average times for each system are shown below.

OS/2 Total Time	Windows Total Time	Difference	Percent Difference
841.28 seconds	750.78 seconds	90.51 seconds	10.76%

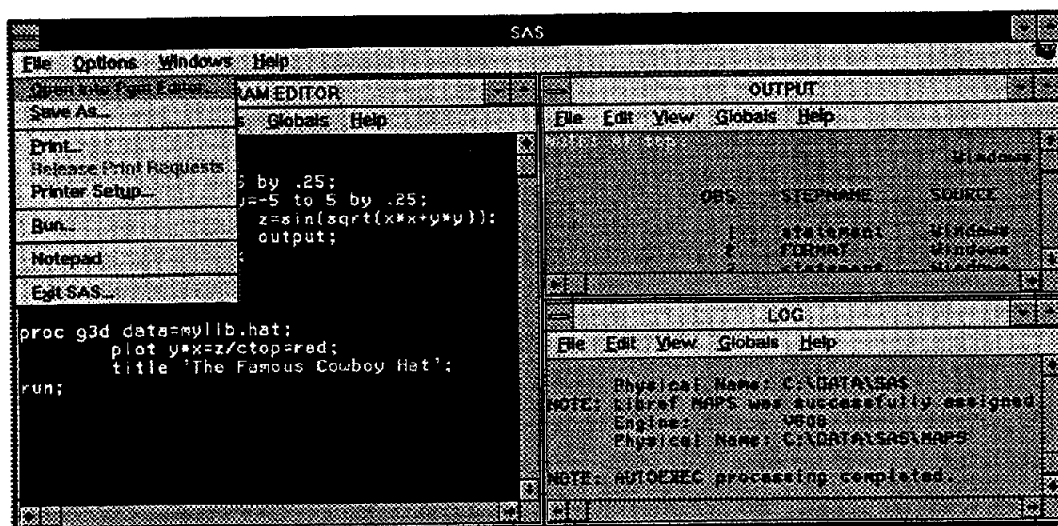


Fig. 1. The Application Work Space.

Application Workspace

SAS Software for Windows uses the standard SAS Display Manager System windowing scheme. All Display Manager windows are contained in the Application Work Space (AWS). Figure 1 shows the AWS window and File menu. The File menu offers several useful functions. For instance, you can select Print to print the contents of any child window (editor, log, graph, etc.). You can also add items to the File menu. In Figure 1 "Notepad" has been added.

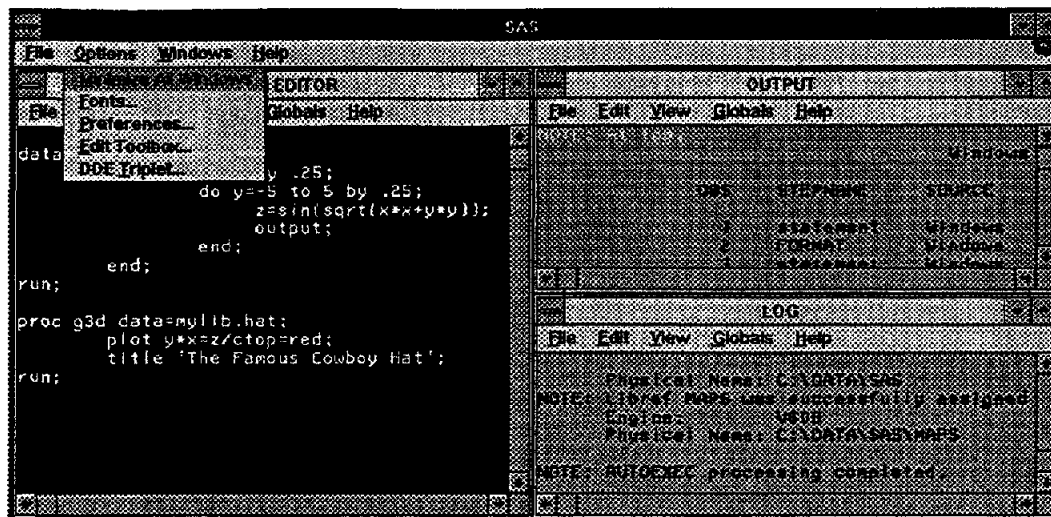


Fig. 2 The AWS Options Menu

As you can see, there was a performance difference for this mix of steps. Somewhat to my surprise, the Windows system was faster. Figure 3 shows a scatter plot of the time differences for all steps. Note that most execution times are clustered around the zero difference line with several outliers at both ends. When times for these outlier steps are examined, some distinct performance differences do emerge. The printout in Figure 4 shows the steps where there was a five second or more difference between the two systems. The Windows system was slower on PROC GMAP but faster on several DATA steps. These numbers

represent absolute times. You can see that where Windows was faster in the DATA steps, it was faster as a greater percentage of the total step time. While Windows was slower running PROC GMAP steps, it was faster running GCHART.

This benchmark is interesting but it must be remembered that the Windows system was a beta release. There may be significant differences

in the 6.08 production release. Also note that the OS/2 system was version 6.06 not 6.08. Again, there may be significant differences between the 6.06 and 6.08 releases of the SAS System.

The Toolbox

SAS Software for Windows 6.08 includes several useful features. One of these is the Toolbox shown in Figure 5. The Toolbox is similar to the now common toolbar or speedbar found in many Windows applications. You can assign any

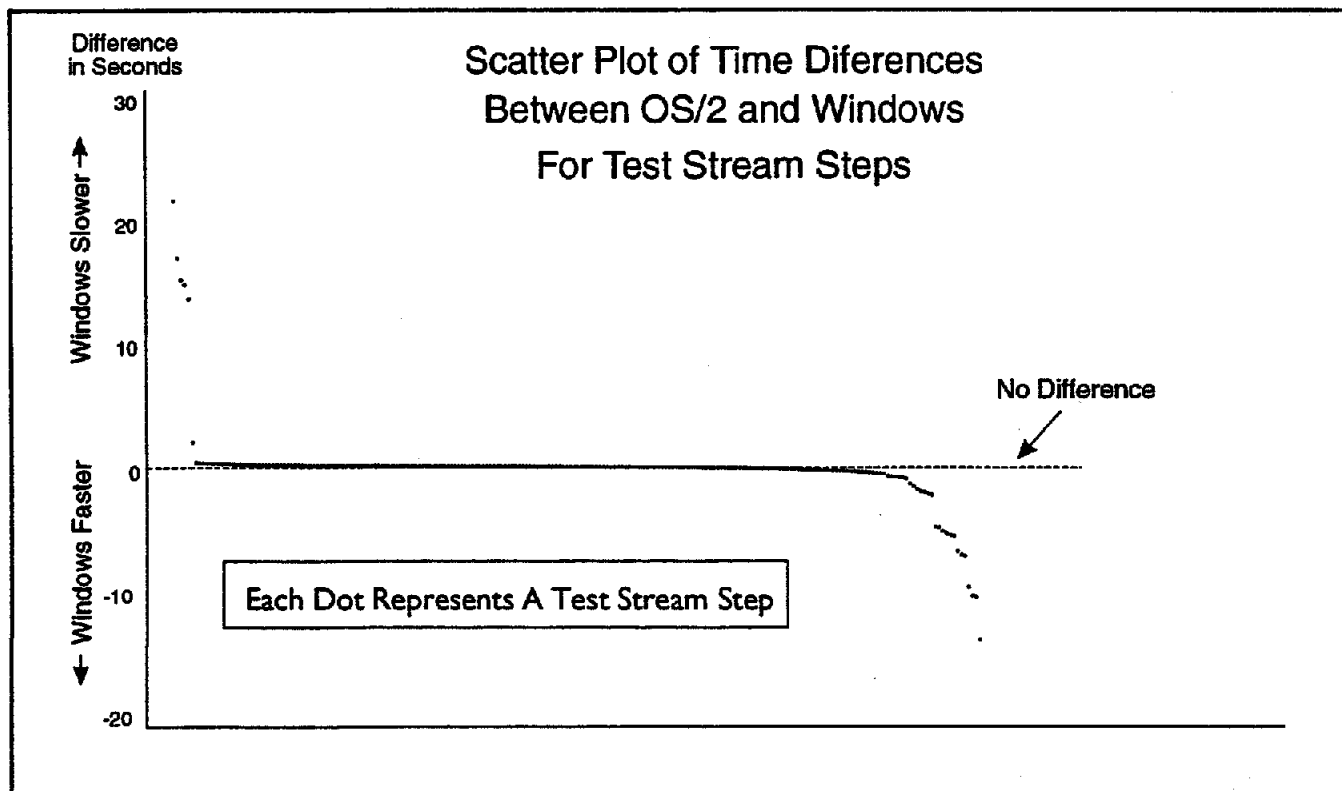


Fig. 3 Benchmark Step Time Scatter Plot

Test Stream Steps
With a 5 Second or Greater Difference

OBS	Step Type	Step Name	Windows Time	OS/2 Time	Difference
1	PROCEDURE	GMAP	82.28	60.81	21.47
2	PROCEDURE	GMAP	77.60	60.83	16.77
3	PROCEDURE	GMAP	77.00	61.96	15.04
4	PROCEDURE	GMAP	77.44	62.81	14.63
5	PROCEDURE	GMAP	76.39	62.89	13.50
6	PROCEDURE	GCHART	22.41	27.55	-5.14
7	DATA	statement	10.82	16.03	-5.21
8	DATA	statement	10.71	16.21	-5.50
9	DATA	statement	10.86	16.53	-5.67
10	DATA	statement	10.92	16.75	-5.83
11	DATA	statement	11.25	17.16	-5.91
12	DATA	statement	10.05	17.16	-7.11
13	PROCEDURE	GCHART	23.01	30.42	-7.41
14	PROCEDURE	GCHART	22.57	30.05	-7.48
15	PROCEDURE	GCHART	22.67	32.71	-10.04
16	DATA	statement	9.93	20.69	-10.76
17	DATA	statement	9.83	20.67	-10.84
18	DATA	statement	9.83	24.16	-14.33

Fig. 4 Benchmark Steps With a Greater Than 5 Second Difference

display manager command to the Toolbox buttons. You can also add your own icons. To edit the Toolbox select Edit Toolbox from the AWS options menu (Figure 2). The Toolbox edit dialog is shown in Figure 6. To change the command associated with a tool you simply edit the com-

To add your own icons you need to create a bitmap in an application like Paintbrush. To add a "clear text" tool, a proofreader's delete mark is drawn in Paintbrush. The icon is copied to the clipboard with the Paintbrush Edit/Copy command. To add the icon, select an icon to replace in

the SAS tool edit dialog. Here, the lower right icon is selected. Then select the Paste button. The new icon replaces the old. Next the command "clear text" is entered in the command box as shown in Figure



Fig 5 The Toolbox

mand line next to the icon. You can also change the configuration of the Toolbox with the Tool Size and Tools Per Row settings.

7.

You can create any number of customized tool boxes. A custom tool box can be loaded as the default or you can load a custom tool box when needed.

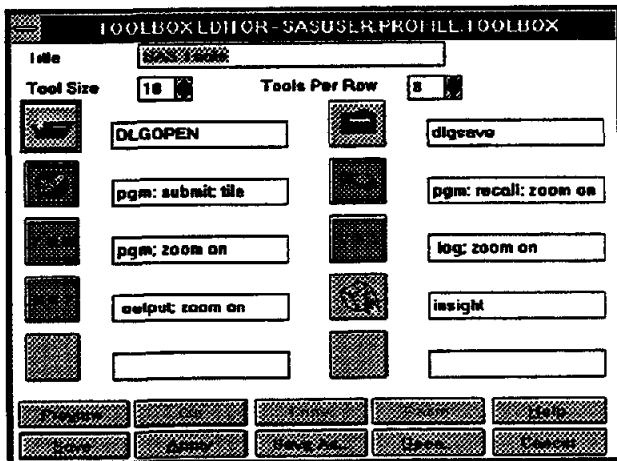


Fig. 6 Toolbox Edit Dialog, before change

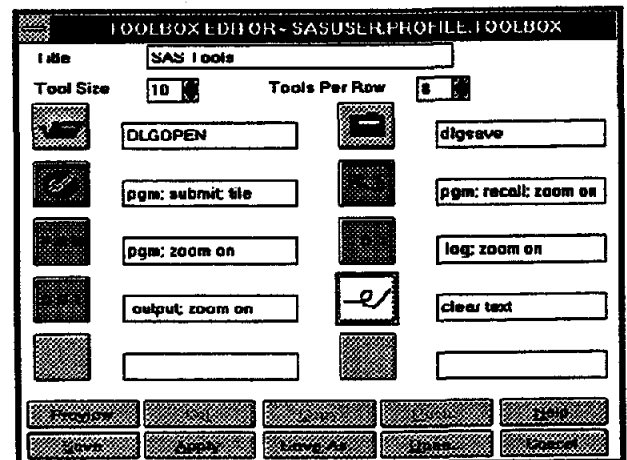


Fig 7 Adding A "clear text" tool

Table: MGE01.DB							
1	8/22/1987	8/22/1987	32.00	\$7.34	376.00	\$3.00	125.00
2	9/22/1987	9/22/1987	24.00	\$7.25	371.00	\$3.35	125.00
3	10/22/1987	10/22/1987	34.00	\$7.22	430.00	\$3.57	125.00
4	11/1/1987	12/28/1987	185.00	\$69.01	710.00	\$46.47	125.00
5	12/2/1987	12/1/1988	213.00	\$194.03	725.00	\$47.77	150.00
6	1/22/1988	2/18/1988	101.00	\$112.90	450.00	\$38.45	147.00
7	2/18/1988	3/22/1988	83.00	\$75.48	371.00	\$75.68	157.48
8	3/22/1988	4/21/1988	50.00	\$35.44	295.00	\$21.07	69.00
9	4/21/1988	5/20/1988	35.00	\$23.79	277.00	\$28.88	428.00
10	5/20/1988	6/3/1988	18.00	\$12.57	\$35.00	\$28.61	
11	6/3/1988	7/27/1988	15.00	\$15.72	491.00	\$40.40	
12	7/27/1988	8/22/1988	15.00	\$11.77	615.00	\$38.47	
13	8/22/1988	9/24/1988	17.00	\$13.05	373.00	\$32.29	
14	9/22/1988	10/11/1988	24.00	\$17.17	345.00	\$25.82	407.00
15	10/11/1988	11/7/1988	81.00	\$48.40	443.00	\$30.55	600.00
16	11/7/1988	12/21/1988	145.00	\$94.58	753.00	\$48.76	1200.00
17	12/21/1988	12/9/1989	174.00	\$140.73	809.00	\$57.22	1324.00
18	1/23/1989	2/2/1989	157.00	\$107.03	668.00	\$45.75	1207.00
19	2/2/1989	3/22/1989	140.00	\$81.67	875.00	\$44.95	1200.00

Fig. 8 DDE Source Data: Paradox Table MGE01.DB

The Toolbox is a welcome addition to the SAS System. It can speed up common functions like submitting and recalling program text.

Dynamic Data Exchange (DDE)

SAS Software for Windows takes advantage of Dynamic Data Exchange (DDE). This can be useful for extracting data from other DDE aware applications. For example, you can directly extract data from Paradox for Windows without using SAS/ACCESS or the Paradox export function and a DATA step. In the following example, utility bill information is extracted from the Paradox for Windows table called MGE01.DB shown in Figure 8.

To extract this data first open the table and use Edit/Select All and Edit/Copy to place a reference to the table in the clipboard. From the SAS AWS Options menu (see Figure 2) select DDE Triplet. The DDE string is displayed as shown in Figure 9. Select and copy this string to the clipboard. You can then paste the string from the clipboard

into a FILENAME statement. Next, write a DATA step that uses an INFILE statement reference to this FILENAME statement. Through DDE, the filename refers to the Paradox table as an external file. Examine the following program as a usage example.

```
options noxwait noxsync;

x 'd:';
x 'cd \pdxwin';
x 'd:\pdxwin\pdxwin.exe c:\mge\mge01.db';

filename pdox dde
'PDOXWIN|WORK:MGE01.DB!_TABLE';

data util;
  infile pdox;
  input recno month :mmddyy8. enddate
:mmddyy8.
      guse :comma5. gas :dollar7.2
      euse :comma5. elec :dollar7.2;
run;
```

The DDE server, in this case Paradox, must be running when the DDE call is made, so this program contains statements to start Paradox for Windows. When the program runs, the Paradox table is read to create the SAS data set UTIL.

Impressions

My first impressions of SAS Software for Windows are generally positive. I use several other Windows applications and the ability to run the SAS System concurrently with these applications is a great convenience. Performance under Windows seems to be on par with the OS/2 version 6.06 system. Dynamic Data Exchange has proven to be a useful feature for sharing data across applications.

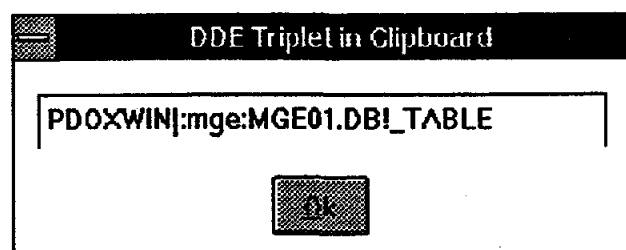


Fig. 9 The DDE String Display

If you are used to the workings of Windows editors and word processors, the Display Manager Program Editor can be somewhat annoying. High on my wish list would be to make the program editor work just like the Windows Notepad editor. The SAS help system, while consistent across platforms, is awkward compared to the standard Windows help system.

Overall, SAS Software for Windows is a welcome addition to the SAS family. It offers great convenience to those of us who do much of our work with Windows applications. It means no more OS/2 dual boots or the need to use the older versions of SAS Software under DOS. □