Paper 47-2012

# Doing More with the Display Manager: From Editor to ViewTable – Options and Tools You Should Know

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## ABSTRACT

If you have used the interactive interface for SAS® you have most likely used the Display Manager. As it ships, the Display Manager is very powerful and yet fairly easy to use with a minimal learning curve for the new user. Because it is functional 'right out of the box', most users do very little to customize the interface. This is a shame, because the Display Manager contains a great many hidden opportunities to make it even more powerful, even easier to use, and customized for your way of using the interface.

The Display Manager builds a variety of windows, screens, and dialogue boxes to facilitate communication between SAS, the Operating System, and the user. For each of the five primary windows and extending to the dozens of secondary windows there are options that control the content, display, and level of interaction. Options have defaults and a majority of these can be easily changed to suite your needs.

You think that you know the Display Manager, but you will be amazed at what you have yet to learn. From simple tricks that will save you hours of work, to embedding tools and macros in the Enhanced Editor; there is so very much more that we can do in the Display Manager.

## KEY WORDS

Display Manager, Enhanced Editor, ViewTable, SAS Explorer, WSAVE

## INTRODUCTION

The Display Manager is extremely customizable. Many of these possible customizations are a bit over the top, but there are a number that are very helpful. Virtually every option has a default that can be changed. Tool bars and pull down menus can be customized. You can execute programs with a single keystroke and you can create short cuts and editing tools for use with the Enhanced Editor.

Most of these customizations are easy, and most only require a bit of imagination as to what you would like to have different for your work environment.

The examples shown in this paper are adapted from Chapter 14 of the book *Carpenter's Guide to Innovative SAS® Techniques* by Art Carpenter. Depending on the version of SAS, the operating system (OS), and the way that SAS is installed and executed at your location, the appearance of some of the screens may vary from those shown in this paper. The basics however should be the same.

When using the Display Manager many of the options, tool bars, and pull down menus are window dependent. This means that you will need to be careful to properly select the active window when a following the steps in the following examples.

# DM COMMANDS AND FUNCTION KEYS

The earliest versions of the Display Manager predated the mouse or even GUI interfaces. To assist with navigation a series of commands designed to be typed into the Command Box or on the Command Line were developed. These even included an editor. Although still available many of these commands are no longer useful, however some can still be very helpful.

## Commands

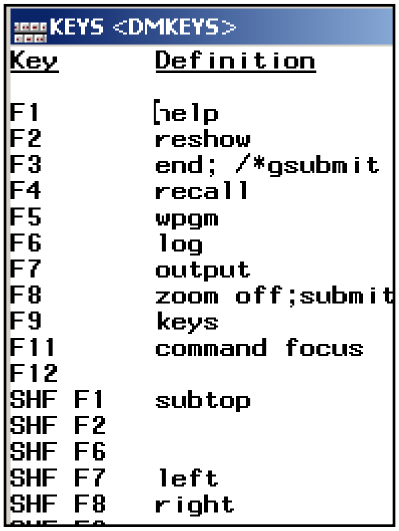
Each of the five primary and all of the secondary windows have names. Typing the name of the window in the Command Box makes that the active window

Primary and secondary window names include:

- wpgm enhanced editor
- log log
- output Output window
- explorer SAS explorer
- title titles window

Other useful commands include:

- clear clear the contents of the active window
- submit submit the contents of the editor for execution (editor must be the active window)
- help initiate a SAS help session
- zoom maximize or shrink the size of a window


KEYS <DMKEYS>

```
Key        Definition

F1         help
F2         reshow
F3         end; /*gsubmit
F4         recall
F5         wpgm
F6         log
F7         output
F8         zoom off;submit
F9         keys
F11        command focus
F12
SHF F1     subtop
SHF F2
SHF F6
SHF F7     left
SHF F8     right
```

## Function Keys

One or more commands can be assigned to function keys. The current key assignments can be seen be seen by examining the KEYS window. Type KEYS (or by default press F9) to bring up the KEYS window. Each of these assignments can be modified by the user. Multiple commands can be chained together. By default F8 shrinks the editor window and submits the code for execution.

## DM Statement

The DM statement allows you to execute one or more Display Manager commands from within a SAS Program. These are the same commands that can be used in the command box, on the command line, or from the KEYS window.

```
DM <windowname> 'action' <windoname>;
```

If you do not need to designate or change the active window all you need is the *action*. This is common when performing a DM task from within a batch program.

The command to the right will clear the LOG window.

```
dm log 'clear';
```

Multiple DM commands can be included in a single DM statement by chaining them together with semicolons. This DM statement turns off the program editor and executes an AF program making the AF window active.

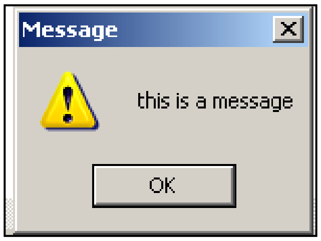
```
dm  af "pgm off; af cat = appls.allproj.passwd.program";
```

You can also reroute the LOG to a file much as you could by using PROC PRINTTO or the ALTLOG option.

```
dm 'log; file "&path\logdump1.log"';
```

The POST command can be used to post a message box to the users screen. This can be a much stronger attention grabber than just a message to the LOG.

```
dm 'post "this is a message"';
```



this is a message

In the DM statement the enhanced editor is opened using the WEDIT command, and if followed by a file name, a specific file can be loaded and opened for editing.

```
dm 'wedit "C:\temp\test.sas"' ;
```

The ViewTable can be invoked as well using either the VIEWTABLE or VT command. Here the data set ADVRPT.DEMOG is opened with the variable names shown as column headings (COLHEADING=LABELS is the default).

```
dm "viewtable advrpt.demog colheading=names";
```

The DM statement can also be used to assign a specific command to a function key. The KEYDEF command is used to make the assignment. Here the F12 key is assigned to clear the log.

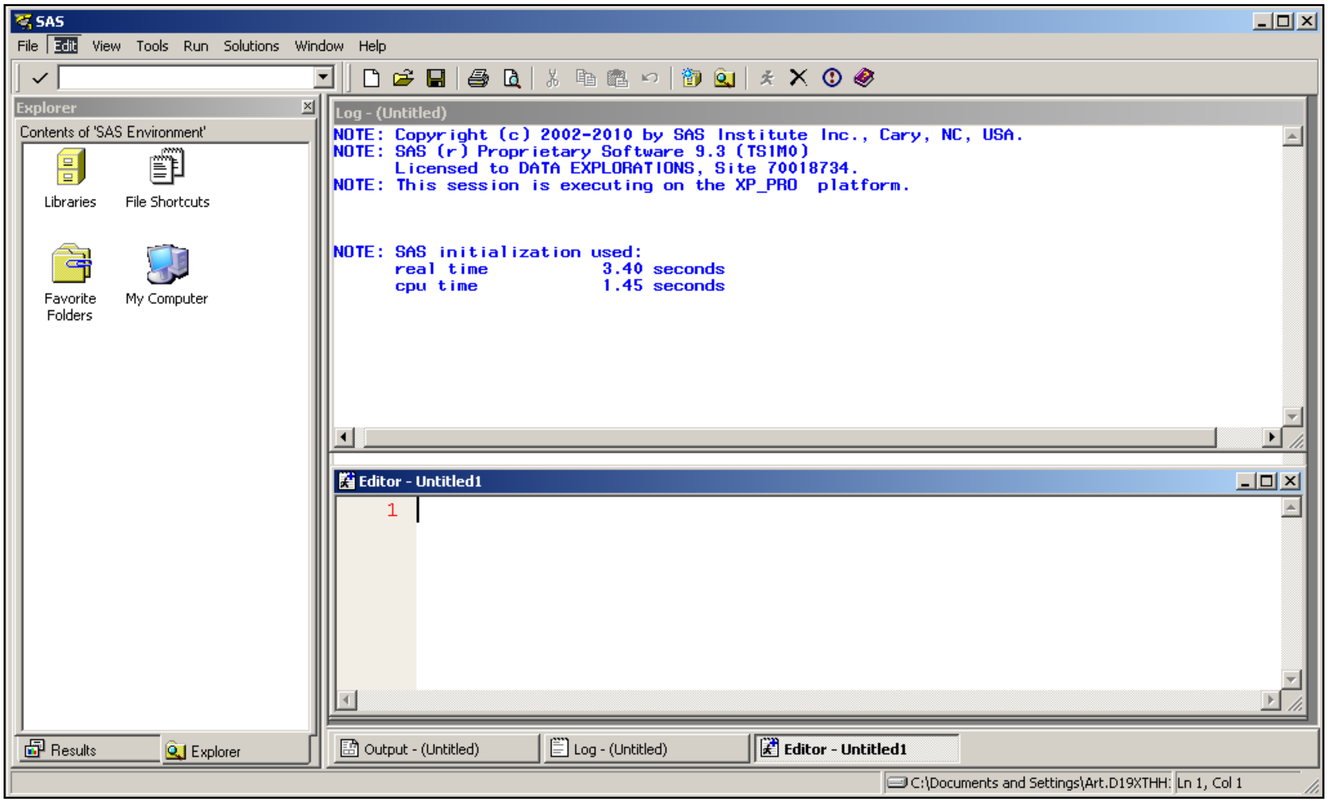
```
dm 'keydef f12 "log;clear"';
```

For combination keystrokes enclose the key definition in quotes as well. The SHIFT F9 key will now close the next open ViewTable window. Close a series of open VT windows with successive selections of SHIFT F9.

```
dm 'keydef "shf f9" "next VIEWTABLE:; end"';
```

## CUSTOMIZING AND SAVING WINDOW APPEARANCE

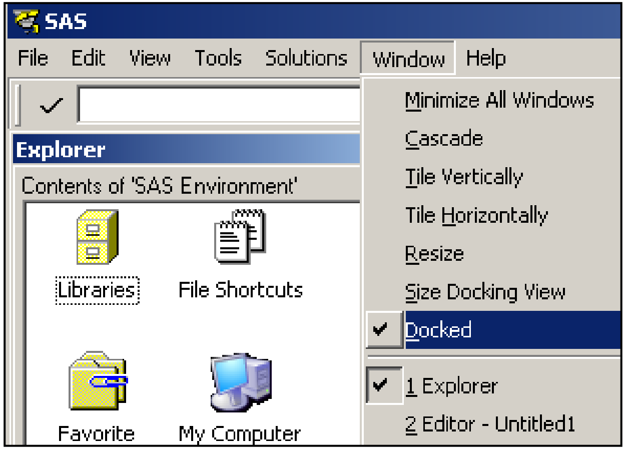
By default the five primary windows of the display manager are arranged so that the OUTPUT window is hidden, and the RESULTS window is docked and hidden behind the EXPLORER window which is also docked.



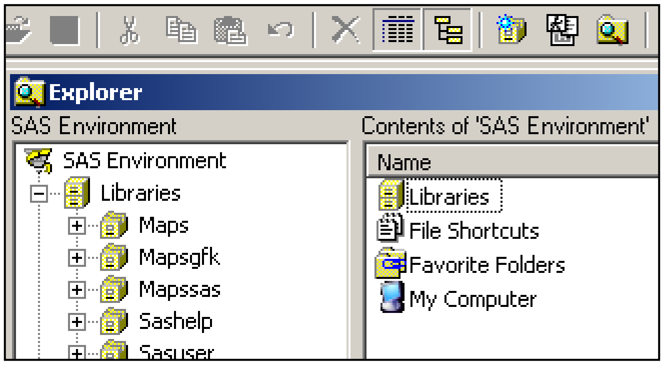
```
NOTE: Copyright (c) 2002-2010 by SAS Institute Inc., Cary, NC, USA.
NOTE: SAS (r) Proprietary Software 9.3 (TS1M0)
      Licensed to DATA EXPLORATIONS, Site 70018734.
NOTE: This session is executing on the XP_PRO  platform.


NOTE: SAS initialization used:
      real time           3.40 seconds
      cpu time            1.45 seconds
```

These windows can be moved, resized, and their new attributes saved. The EXPLORER and RESULTS windows can be undocked by selecting the DOCKED option under the WINDOW pull down menu. Allowing these windows to float is especially useful on laptops or monitors with limited real estate.



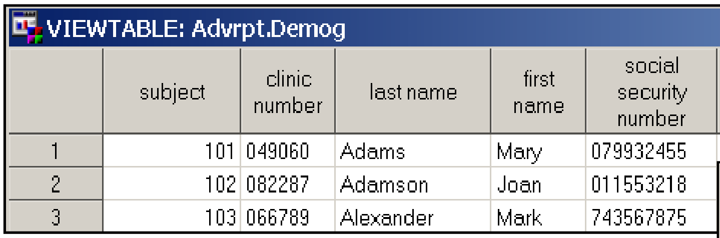
For the EXPLORER I like the traditional view and like to select the DETAILS and TREE options on the tool bar.



The size and position of each of these windows can be adjusted using standard mouse/window techniques. Once they have been adjusted the way you want them, use the WSAVE ALL command in the command box to save these settings for your next SAS session.

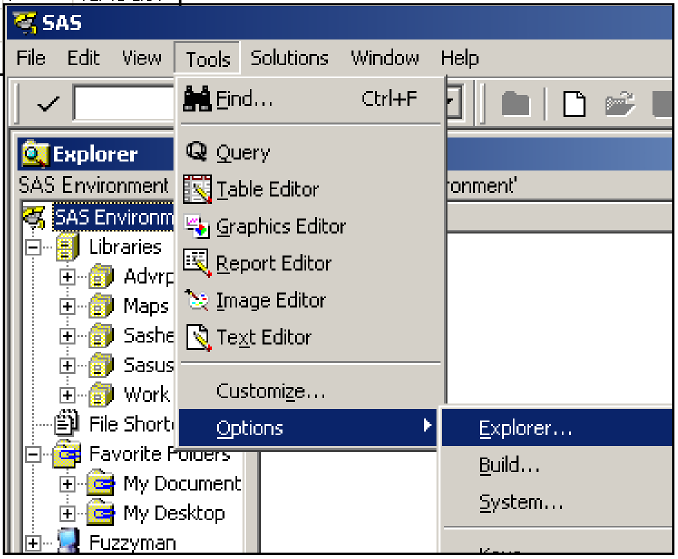
## SHOWING COLUMN NAMES IN THE VIEWTABLE

By default the VIEWTABLE window displays variable labels as column headers. I find this to be very annoying as I almost always want to see the variable name. Fortunately the default can be changed to show the column names instead of the labels.



VIEWTABLE: Advrpt.Demog

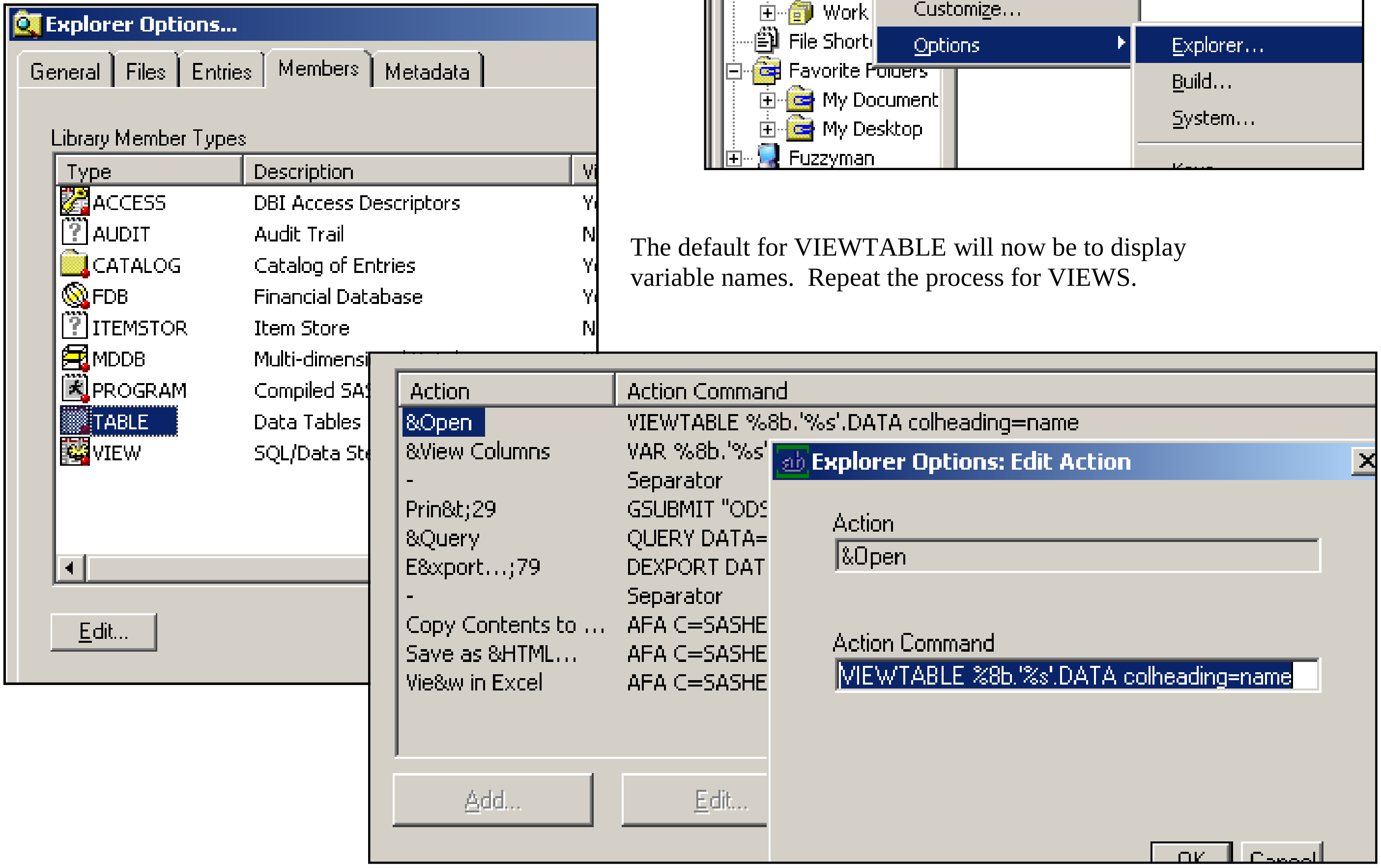
| | subject | clinic number | last name | first name | social security number | patient sex | date of birth |
|---|---|---|---|---|---|---|---|
| 1 | 101 | 049060 | Adams | Mary | 079932455 | F | 12AUG51 |
| 2 | 102 | 082287 | Adamson | Joan | 011553218 | | |
| 3 | 103 | 066789 | Alexander | Mark | 743567875 | | |



With the SAS Explorer Window active, select: TOOLS - OPTIONS - EXPLORER.

This brings up the Explorer Options dialog box shown below, select: MEMBERS - TABLE – EDIT
Edit the line with the ACTION of &OPEN
and add colheading= name.

The default for VIEWTABLE will now be to display variable names. Repeat the process for VIEWS.



Library Member Types

| Type | Description | Vi |
|---|---|---|
| ACCESS | DBI Access Descriptors | Y |
| AUDIT | Audit Trail | N |
| CATALOG | Catalog of Entries | Y |
| FDB | Financial Database | Y |
| ITEMSTOR | Item Store | N |
| MDDB | Multi-dimensi | |
| PROGRAM | Compiled SAS | |
| TABLE | Data Tables | |
| VIEW | SQL/Data St | |

| Action | Action Command |
|---|---|
| &Open | VIEWTABLE %8b.'%s'.DATA colheading=name |
| &View Columns | VAR %8b.'%s' |
| - | Separator |
| Prin&t;29 | GSUBMIT "ODS |
| &Query | QUERY DATA= |
| E&xport...;79 | DEXPORT DAT |
| - | Separator |
| Copy Contents to ... | AFA C=SASHE |
| Save as &HTML... | AFA C=SASHE |
| Vie&w in Excel | AFA C=SASHE |

Action: &Open

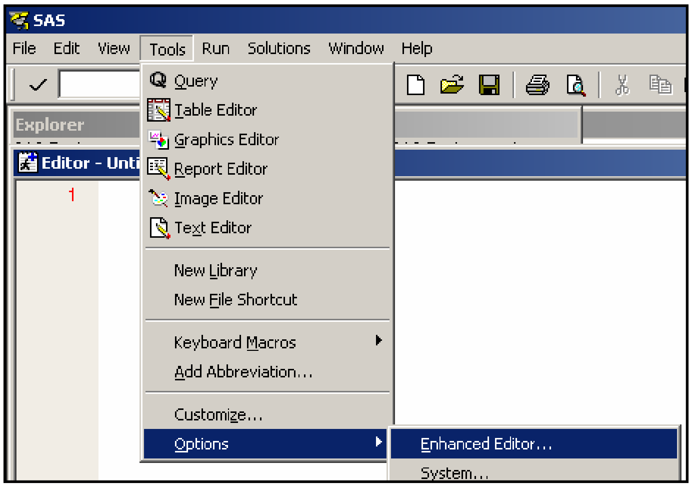
Action Command: VIEWTABLE %8b.'%s'.DATA colheading=name

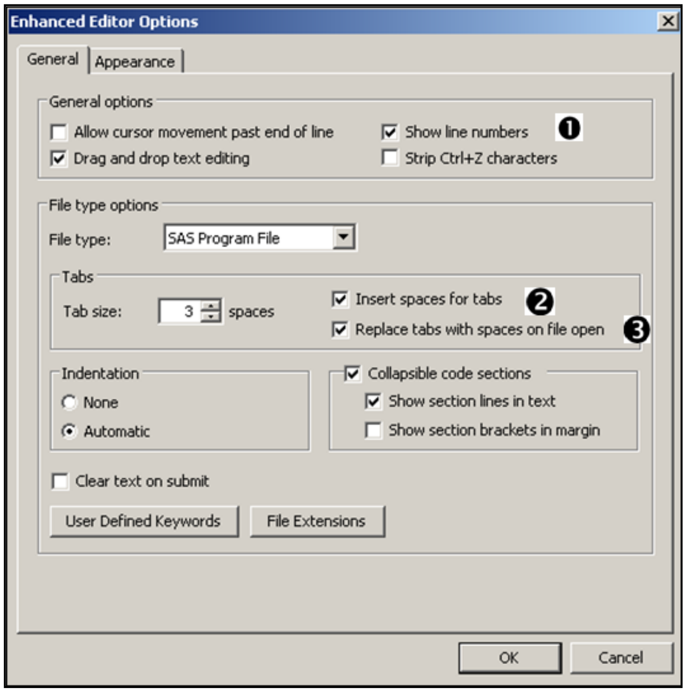
# ENHANCING THE ENHANCED EDITOR

There are a number of options and shortcuts available for use with the Enhanced Editor. It is also possible to do a fair amount of customization.

## Editor Setup

There are only a few set up preferences that I would recommend that you change. Most of the defaults are fine for typical users. The options for the Enhanced editor can be found when the editor is the active window. Use TOOLS – Options – Enhanced Editor. This brings up the Enhanced Editor Options dialog box. I like to select 'Show Line numbers' ❶, because it makes life easier for large programs. More importantly, be sure to check 'insert spaces for tabs' ❷ and 'replace tabs with spaces on the open' ❸. Both of these options help to make it easier to maintain the text formatting of a SAS program when it is transferred between programmers.




Enhanced Editor Options

General | Appearance

General options

□ Allow cursor movement past end of line
☑ Show line numbers ❶
☑ Drag and drop text editing
□ Strip Ctrl+Z characters

File type options

File type: SAS Program File

Tabs

Tab size: 3 spaces
☑ Insert spaces for tabs ❷
☑ Replace tabs with spaces on file open ❸

Indentation

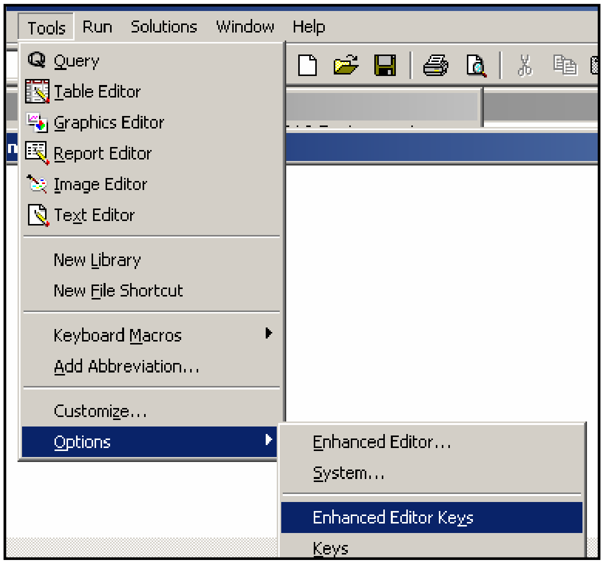
○ None
● Automatic

☑ Collapsible code sections
☑ Show section lines in text
□ Show section brackets in margin

□ Clear text on submit

## Enhanced Editor Keys

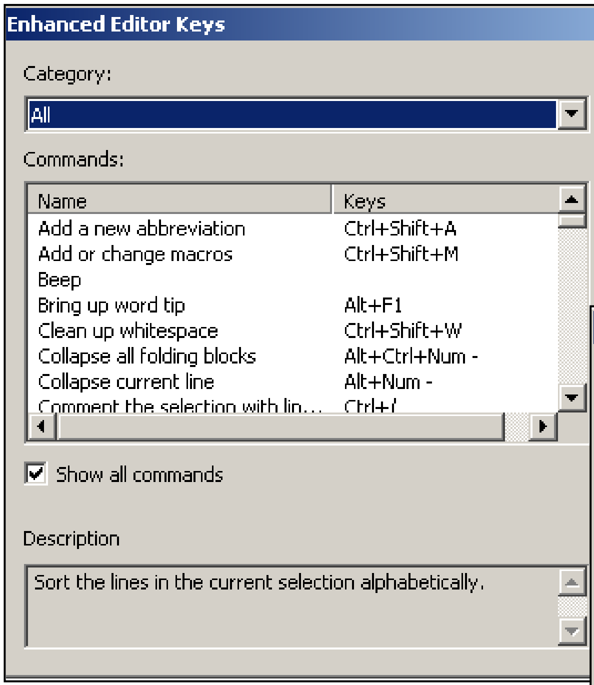
The editor has been set up with a number of short cut key combinations. Depending on how you work and what things you tend to do, some of these key combinations can be very useful. You can see and learn more of these key combinations through the Enhanced Editor Keys pull down menu. While the Enhanced Editor is the active window, go to TOOLS – OPTIONS – ENHANCED EDITOR KEYS.



Explore the resulting dialog box to find the key combinations that are most useful to you. I especially like to use:

| | |
|---|---|
| Ctrl+/ | add comments |
| Ctrl+shift+/ | remove comments |
| Ctrl+F2 | mark a line in a program |
| F2 | jump to the next marked line |
| Shift+F | jump to the previous marked line |

Not only are the defined key combinations very useful, but you can redefine the combinations and add new keyed operations. Notice that the BEEP has no assigned key combinations and is therefore not available. While BEEP is probably not particularly useful, others can be, you can scroll down the list of available operations until you find one of interest. Here “Sort the selected lines” has been highlighted. Next press the “Assign keys…” button.



**Enhanced Editor Keys**

Category: All

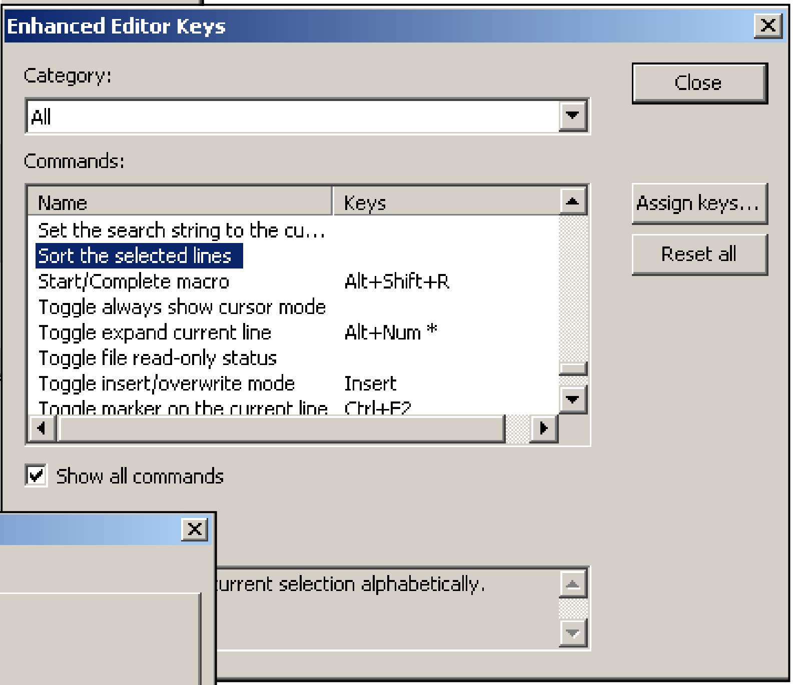
Commands:

| Name | Keys |
|---|---|
| Add a new abbreviation | Ctrl+Shift+A |
| Add or change macros | Ctrl+Shift+M |
| Beep | |
| Bring up word tip | Alt+F1 |
| Clean up whitespace | Ctrl+Shift+W |
| Collapse all folding blocks | Alt+Ctrl+Num - |
| Collapse current line | Alt+Num - |
| Comment the selection with lin… | Ctrl+/ |

☑ Show all commands

Description

Sort the lines in the current selection alphabetically.



**Enhanced Editor Keys**

Category: All

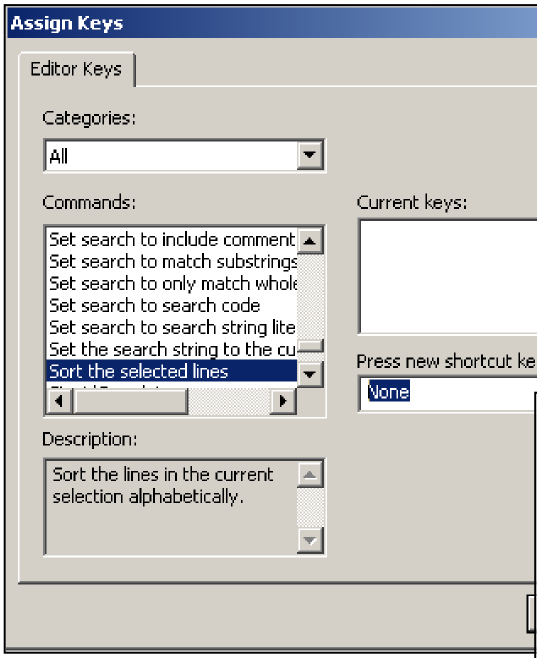
Commands:

| Name | Keys |
|---|---|
| Set the search string to the cu… | |
| Sort the selected lines | |
| Start/Complete macro | Alt+Shift+R |
| Toggle always show cursor mode | |
| Toggle expand current line | Alt+Num * |
| Toggle file read-only status | |
| Toggle insert/overwrite mode | Insert |
| Toggle marker on the current line | Ctrl+F2 |

☑ Show all commands

urrent selection alphabetically.

The ‘Assign Keys’ dialog box is used to assign a set of key strokes to this operation. Highlight the none in the ‘Press new shortcut key:’ box, and then press the desired keys.



**Assign Keys**

Editor Keys

Categories: All

Commands:

Set search to include comment
Set search to match substrings
Set search to only match whole
Set search to search code
Set search to search string lite
Set the search string to the cu
Sort the selected lines

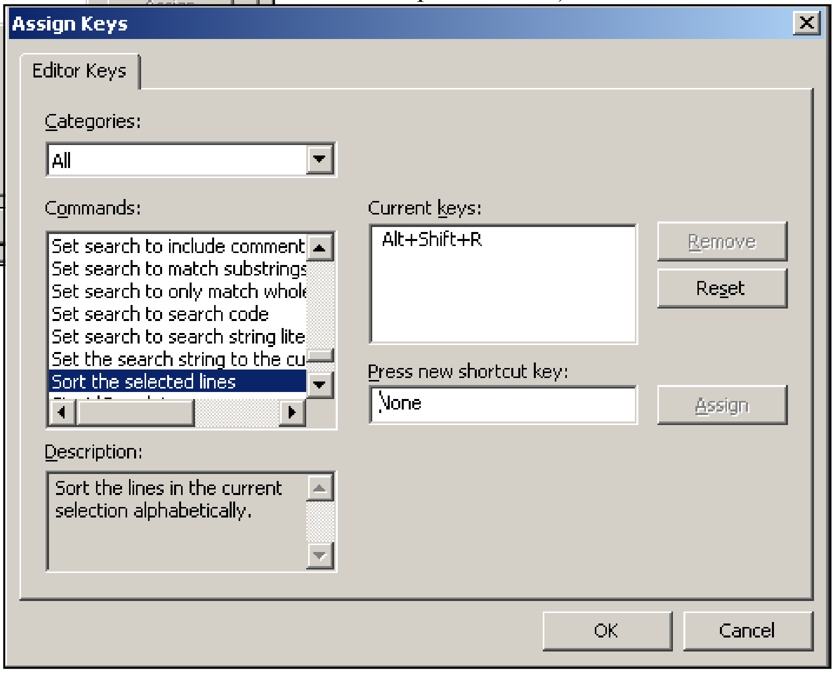
Current keys:

Press new shortcut key: None

Description:

Sort the lines in the current selection alphabetically.

If you select a combination that is already in use, the keystroke combination is changed to be used with the new operation. In this example we are choosing to use Alt + Shift + R (which is already used to ‘Start/Complete  macro’).



**Assign Keys**

Editor Keys

Categories: All

Commands:

Set search to include comment
Set search to match substrings
Set search to only match whole
Set search to search code
Set search to search string lite
Set the search string to the cu
Sort the selected lines

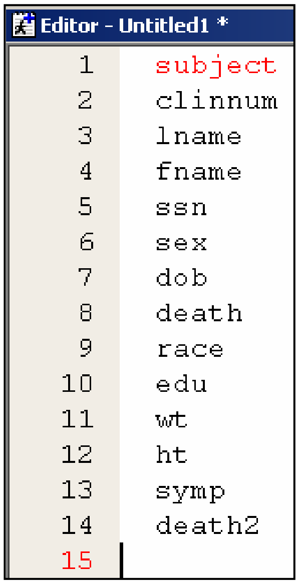
Current keys: Alt+Shift+R

Press new shortcut key: None

Description:

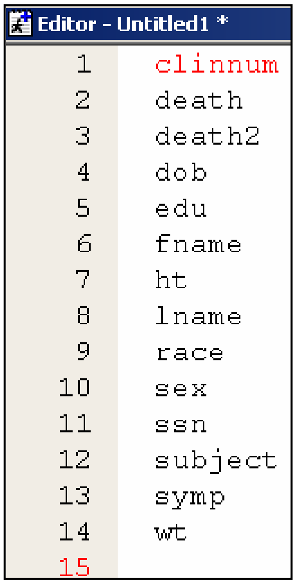
Sort the lines in the current selection alphabetically.

We can now use this key combination in the Enhanced Editor to sort rows.



Editor - Untitled1 *

```
 1   subject
 2   clinnum
 3   lname
 4   fname
 5   ssn
 6   sex
 7   dob
 8   death
 9   race
10   edu
11   wt
12   ht
13   symp
14   death2
15
```



Editor - Untitled1 *

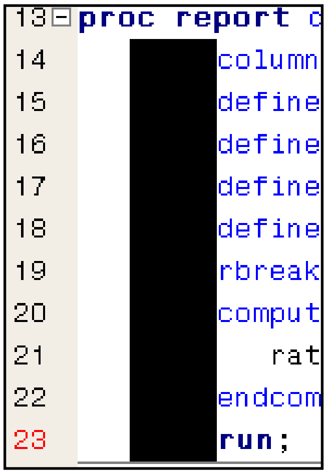
```
 1   clinnum
 2   death
 3   death2
 4   dob
 5   edu
 6   fname
 7   ht
 8   lname
 9   race
10   sex
11   ssn
12   subject
13   symp
14   wt
15
```

The list of variables on the left are in the ADVRPT.DEMOG data set and have been written in variable number order. If the first 14 rows are highlighted and we press the Alt+Shift+R keys the rows are reordered. And the list becomes the one shown on the right.

## Marking a Block of Text

While most applications allow you to hold the left mouse button (LMB) while dragging the mouse to highlight entire lines of text, in the Enhanced editor you can go a couple of steps further. Dragging while the cursor is in the gray area (left side of the editor), ensures that all the text in the first and last lines will be highlighted.

You can highlight, while controlling for columns and lines, by also pressing the 'Alt' key at the same time as dragging with the LMB depressed. In the image to the right, 'delete' would shift lines 14-23 five columns to the left.



```
13 proc report c
14         column
15         define
16         define
17         define
18         define
19         rbreak
20         comput
21            rat
22         endcom
23         run;
```

## AUTOSAVE – Finding the backup file

Files being edited by the Enhanced Editor are automatically saved every few minutes (the frequency is set in the DM preferences under the TOOLS – OPTIONS – PREFERENCES - EDIT tab). If you need to recover the saved file the location can be a bit difficult to find and it varies with OS and version of SAS. Usage Note 12392: Enhanced Editor Autosave should be consulted to find the location of these backup versions of your program. Under Windows the file extension is .ASV.

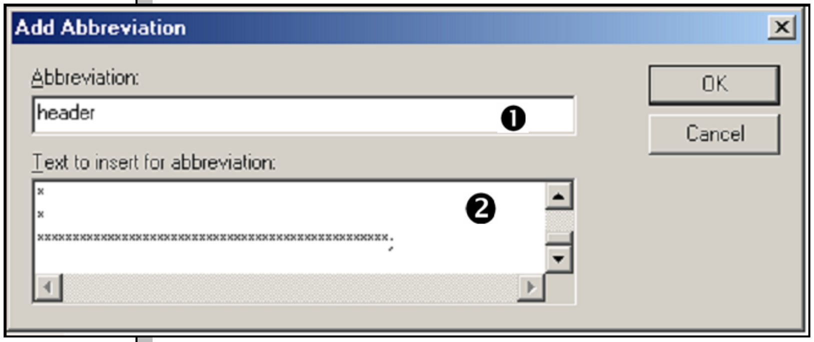
## Macro Abbreviations for the Enhanced Editor

The Enhanced Editor allows you to build abbreviations for your editor. Much like abbreviations in other applications, a single word or part of a word can be typed and then other (generally longer) text can be substituted at a keystroke.

For the purposes of this example assume that you want to type the following header block at the top of each of your programs. Typing it once is fine, but more than once becomes tedious. Let's make a macro abbreviation that does the typing for us.

```
* xxx.sas
*
* Purpose:
*
* Written by:
*   Art Carpenter
*   06Nov2011
*   (907)865-9167
*
* Inputs:
*
* Outputs:
*
* Notes:
*
* Modifications:
*
*
*********************************;
```

While the Enhanced Editor is the active window, use the pull down menus TOOLS – ADD ABBREVIATION (or the editor short cut keys CTRL+SHIFT+A). This brings up the Add Abbreviation dialog box.



Abbreviation: header ❶

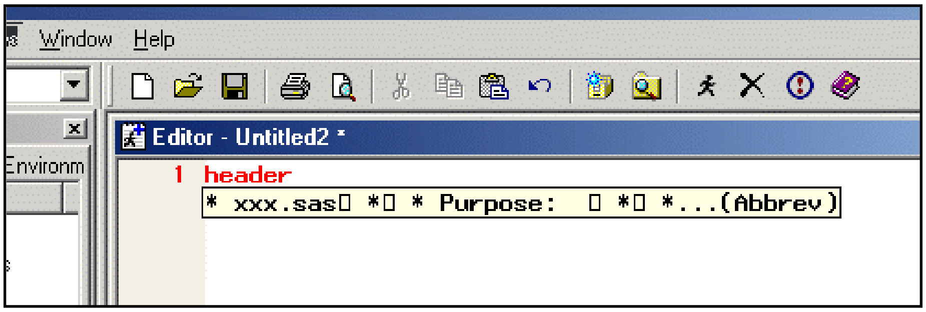
Text to insert for abbreviation: ❷

```
*
*
*********************************************;
```

In the Add Abbreviation dialog box enter a name for the new abbreviation (header) ❶. This becomes a keyboard macro, so you must select a name that has not already been used. Then type (or more practically paste) the substitution text into the 'Text to insert for abbreviation' dialog space ❷. Pressing the OK button creates and stores the abbreviation.

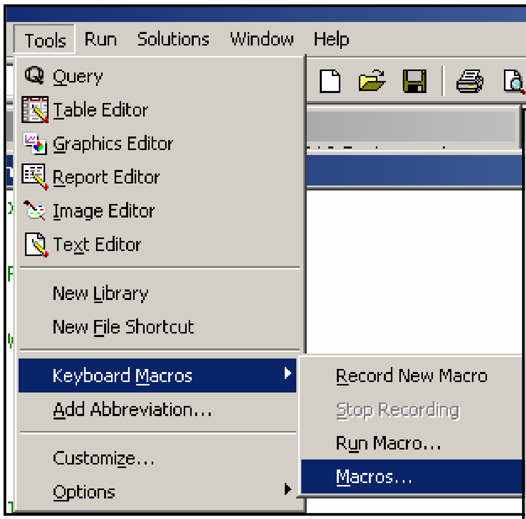
To use the abbreviation simply type in the name of the abbreviation while in the Enhanced Editor. As soon as the last letter of the abbreviation has been entered, a small pop-up 'tip' text box containing the first few characters of the abbreviation is displayed. If at that point you press the TAB or ENTER key, the name of the abbreviation will be replaced by the text that you stored.

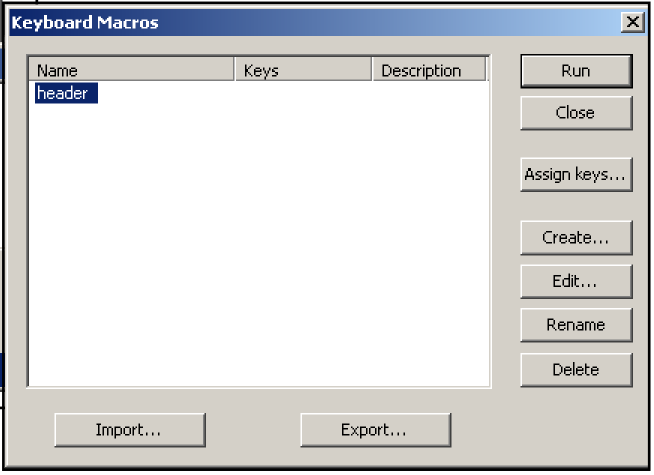
The following screen shot shows that the name of the HEADER abbreviation has been entered in the Enhanced Editor and the first few characters of the text to be substituted is shown in the pop-up 'tip' box. Pressing the TAB or ENTER key causes the abbreviation name to be replaced by the stored text.



```
header
* xxx.sas□ *□ * Purpose:  □ *□ *...(Abbrev)
```

Once created macro abbreviations can be edited or deleted just like any other keyboard macro. Use the pull down menus TOOLS – KEYBOARD MACROS – MACROS to bring up the KEYBOARD MACROS dialog box.





| Name | Keys | Description |
|---|---|---|
| header | | |

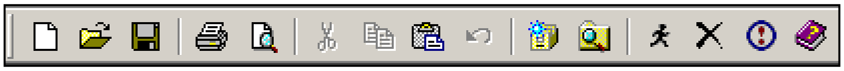
Using this dialog box you may also export/import your macro abbreviations so that they may be standardized across your work group. Use the EXPORT button to create a file with the KMF extension. This file can then be imported by another SAS user.

The date in the HEADER abbreviation shown above is static. There are a number of predefined edits that we can apply to a keyboard macro (remember that a macro abbreviation is a special form of a keyboard macro). Several of these predefined edits allow the insertion of date values. Using these we can automatically insert the current date time stamp when the abbreviation is executed. The steps re-establish the HEADER abbreviation with the current date time value replacing the static date (06Nov2011) are not straight forward, but are discussed in detail in Section 14.4 of *Carpenters Guide to Innovative SAS® Techniques*.

## ADDING TOOLS TO THE APPLICATION TOOL BAR

Like most applications that have pull down menus and tool bars, it is possible to modify or customize the list of available tools. A common usage is when you have a program or code snippet that you run regularly, and would like to have it readily available. By modifying the tool bar, you can add an icon that will instantly execute your program.

Each of the icons, their placement, and even their meaning can be customized. New icons that perform other tasks can be added. The default tool bar for the Enhanced Editor is shown here. In the example that follows an icon will be added that will execute a PROC DATASETS step.

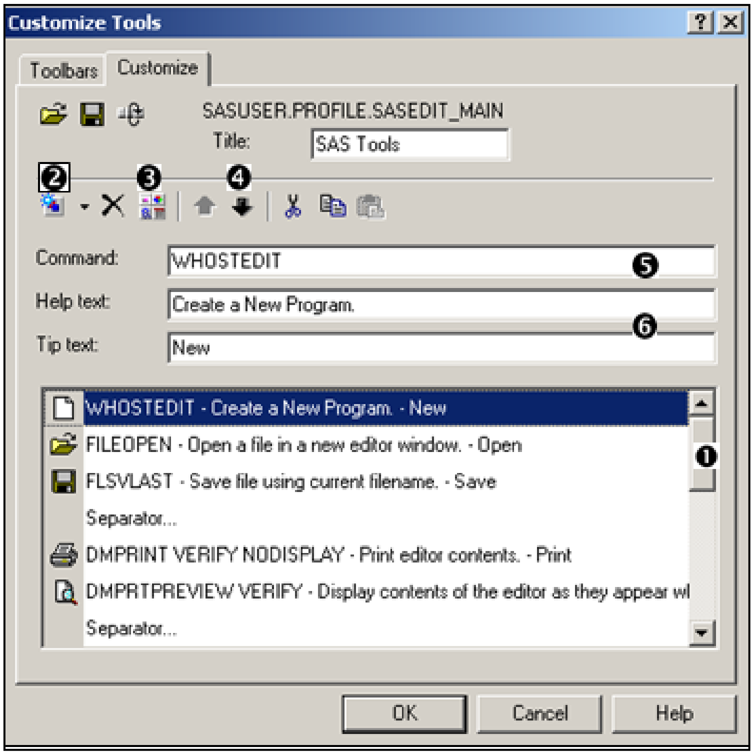


Consider the following program that will delete all the data sets in the work directory. We would like to add an icon on the tool bar associated with the Enhanced Editor that will execute this step. The icon could be placed on any of the tool bars in the DM, this one seems most logical.

```
proc datasets library=work
              memtype=data
              kill
              nolist;
   quit;
```

Use the pull down menus to select TOOLS – CUSTOMIZE (or right click on the tool bar itself). The CUSTOMIZE TOOLS dialog box for the tool bar is shown. From here you can add or remove items on the tool bar. We would like to add an icon that will execute our PROC DATASETS program.

❶ Move the slider to the approximate position of the icon (the final position can be refined later).
❷ Add a blank icon (separators can be useful to make things clearer.
❸ Select an icon for your tool.
❹ Refine the location.
❺On the command line enter the text that is to be executed. In the example that follows we will be executing a GSUBMIT command.
❻ Help and Tip text should be added.
The tool bar icon used to execute the PROC DATASETS step is shown below. The trash can icon ❼ has been selected for the tool bar from a list of supplied icons ❸.


Customize Tools

Toolbars | Customize

SASUSER.PROFILE.SASEDIT_MAIN

Title: SAS Tools

Command: WHOSTEDIT

Help text: Create a New Program.

Tip text: New

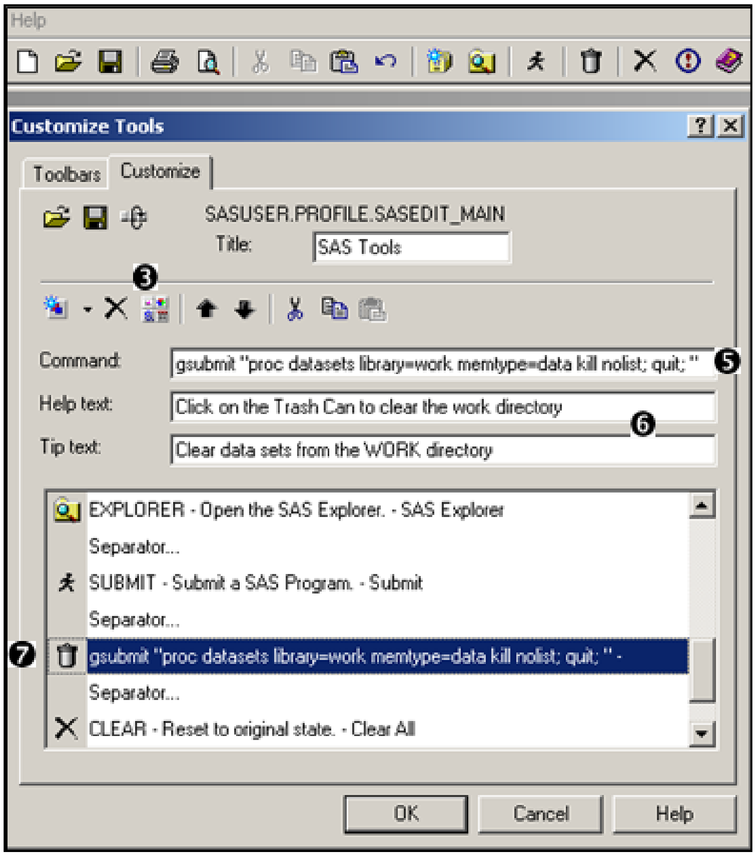
- WHOSTEDIT - Create a New Program. - New
- FILEOPEN - Open a file in a new editor window. - Open
- FLSVLAST - Save file using current filename. - Save
- Separator...
- DMPRINT VERIFY NODISPLAY - Print editor contents. - Print
- DMPRTPREVIEW VERIFY - Display contents of the editor as they appear wl
- Separator...

The GSUBMIT command is a corollary of the DM statement. It allows you to insert code where a command is otherwise expected. In this example the entire step has been placed in the GSUBMIT command. This would have been quite inconvenient if the step had been any longer. Actually the GSUBMIT command only allows 500+ characters. For longer steps consider submitting a macro call or a %INCLUDE statement.

The %INCLUDE becomes a bit problematic if the path to the location of the program contains a macro variable. This is an issue because the string associated with the GSUBMIT command must be quoted. However the %INC also expects either a quoted string or a *fileref*. Strings within strings are often an issue for macro language elements, because at some point the macro variable (*e.g*. &PATH) will be within single quotes. Fortunately in this case, because of how the line is parsed, the single quotes can be used without masking the macro variable.

The GSUBMIT command is only one of a very long list of commands that can be issued from within the Display Manager. Other useful commands include those that bring up other DM windows such as:

- KEYS
- LIBNAME
- LOG
- FILENAME
- TITLE


Customize Tools

Toolbars | Customize

SASUSER.PROFILE.SASEDIT_MAIN

Title: SAS Tools

Command: gsubmit "proc datasets library=work memtype=data kill nolist; quit; "

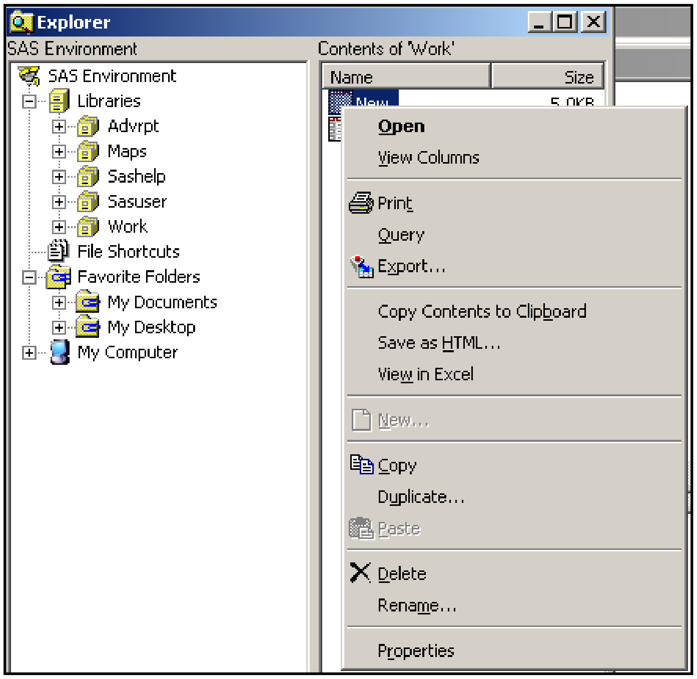
Help text: Click on the Trash Can to clear the work directory

Tip text: Clear data sets from the WORK directory

- EXPLORER - Open the SAS Explorer. - SAS Explorer
- Separator...
- SUBMIT - Submit a SAS Program. - Submit
- Separator...
- gsubmit "proc datasets library=work memtype=data kill nolist; quit; " -
- Separator...
- CLEAR - Reset to original state. - Clear All

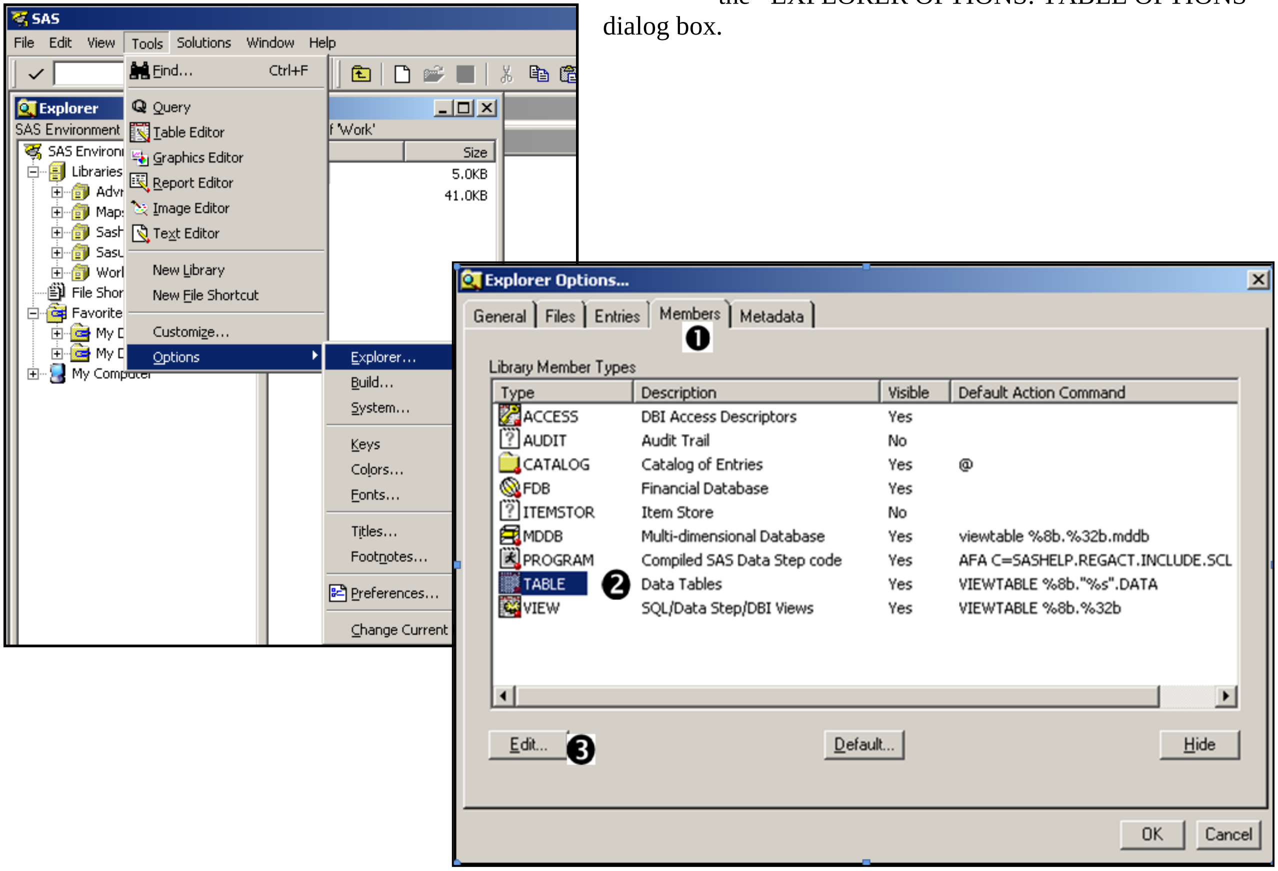
# ADDING TOOLS TO PULL DOWN / POP-UP MENUS

Sometimes adding a specialized tool to the pull down or pop-up menus used in the DM can be very beneficial. In the previous section the GSUBMIT command was used to execute a SAS program from a tool bar. You can do the same sort of thing from a pull down or pop-up menu.

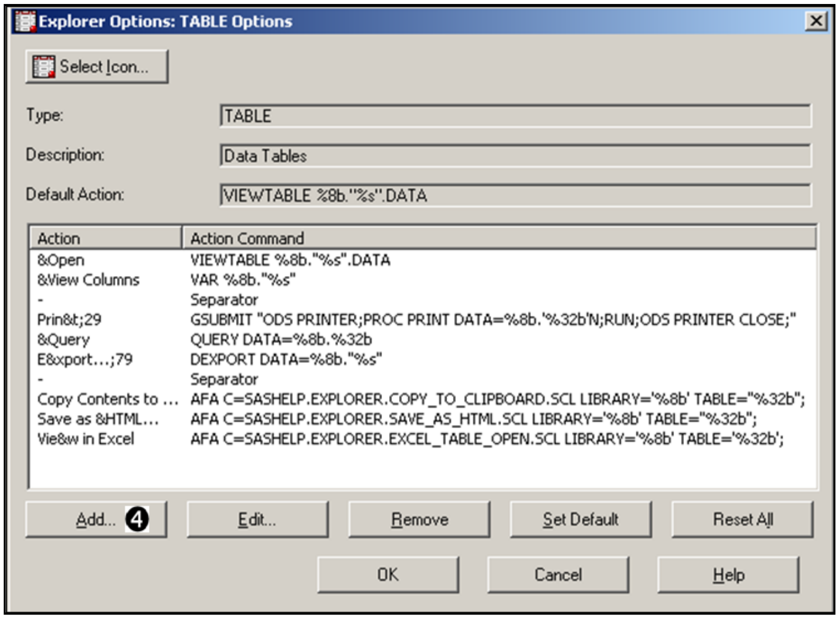


Consider the pop-up menu shown on the left, if you right click on a data set from within the Explorer window. We would like to have the ability to execute a specialized tool against a SAS data set simply by clicking on a menu item in this pop-up menu.

While the Explorer window is active, this menu is controlled through the TOOLS – OPTIONS – EXPLORER menus. This brings up the EXPLORER OPTIONS dialog box. This box is worth exploring, just because it is used to control access to a variety of objects from within the SAS Explorer. Since we want to apply our tool to a SAS data table, we select the MEMBERS tab ❶and then highlight the TABLE (SAS data set) ❷ line. Clicking on the EDIT button ❸ brings up the EXPLORER OPTIONS: TABLE OPTIONS dialog box.



| Type | Description | Visible | Default Action Command |
|---|---|---|---|
| ACCESS | DBI Access Descriptors | Yes | |
| AUDIT | Audit Trail | No | |
| CATALOG | Catalog of Entries | Yes | @ |
| FDB | Financial Database | Yes | |
| ITEMSTOR | Item Store | No | |
| MDDB | Multi-dimensional Database | Yes | viewtable %8b.%32b.mddb |
| PROGRAM | Compiled SAS Data Step code | Yes | AFA C=SASHELP.REGACT.INCLUDE.SCL |
| TABLE | Data Tables | Yes | VIEWTABLE %8b."%s".DATA |
| VIEW | SQL/Data Step/DBI Views | Yes | VIEWTABLE %8b.%32b |



Type: TABLE

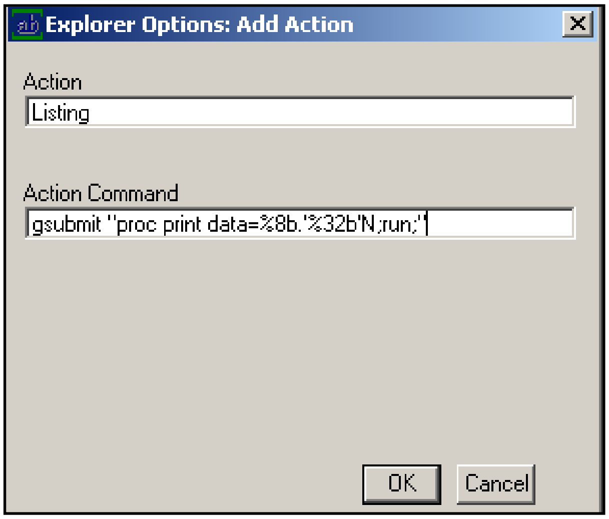
Description: Data Tables

Default Action: VIEWTABLE %8b."%s".DATA

| Action | Action Command |
|---|---|
| &Open | VIEWTABLE %8b."%s".DATA |
| &View Columns | VAR %8b."%s" |
| - | Separator |
| Prin&t;29 | GSUBMIT "ODS PRINTER;PROC PRINT DATA=%8b.'%32b'N;RUN;ODS PRINTER CLOSE;" |
| &Query | QUERY DATA=%8b.%32b |
| E&xport...;79 | DEXPORT DATA=%8b."%s" |
| - | Separator |
| Copy Contents to ... | AFA C=SASHELP.EXPLORER.COPY_TO_CLIPBOARD.SCL LIBRARY='%8b' TABLE="%32b"; |
| Save as &HTML... | AFA C=SASHELP.EXPLORER.SAVE_AS_HTML.SCL LIBRARY='%8b' TABLE="%32b"; |
| Vie&w in Excel | AFA C=SASHELP.EXPLORER.EXCEL_TABLE_OPEN.SCL LIBRARY='%8b' TABLE='%32b'; |

Notice that the EXPLORER OPTIONS: TABLE OPTIONS dialog box is used to form the primary pop-up menu that you see when you right click on a SAS data table (see the first figure in this section). The items in the ACTION COMMANDS section in this dialog box are worth examining. Notice the use of the VIEWTABLE, VAR, GSUBMIT, and QUERY commands. The table name is brought into the script using %8b for the *libref*, and '32b'N for the data set name.

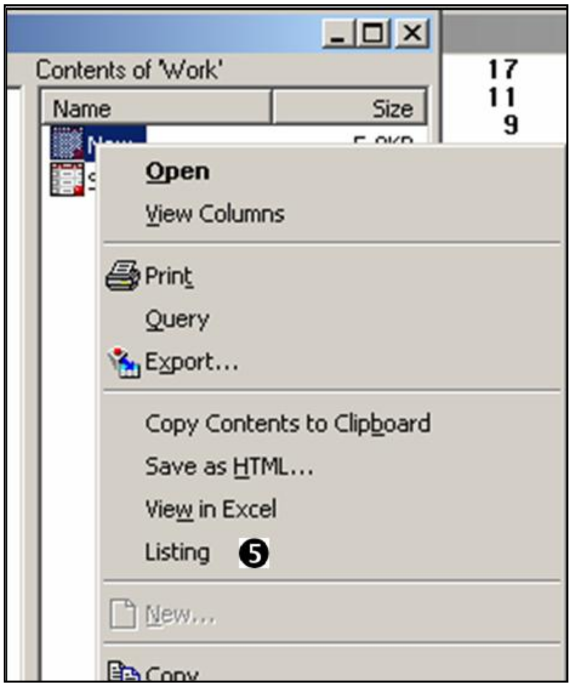
We are going to add a GSUBMIT item to this menu by using the ADD action button ❹. Highlight the item below which you want to insert the new command and press the ADD action button❹. This brings up the ADD ACTION dialog box. Here we enter a name for the action and the action (gsubmit "proc print data=%8b.'%32b'N;run;") that is to take place. Exit from each of the dialogue boxes using OK. A new entry, titled 'Listing' ❺, will now appear on the pop-up associated with a SAS data set. Selecting the 'Listing' entry will perform a PROC PRINT on the highlighted data set.



Action: Listing

Action Command: gsubmit "proc print data=%8b.'%32b'N;run;"

Inserting a PROC PRINT is a bit of a silly thing to do. If you notice the third item in the 'table options' list, you will see that it already contains a GSUBMIT for a PROC PRINT which utilizes ODS.

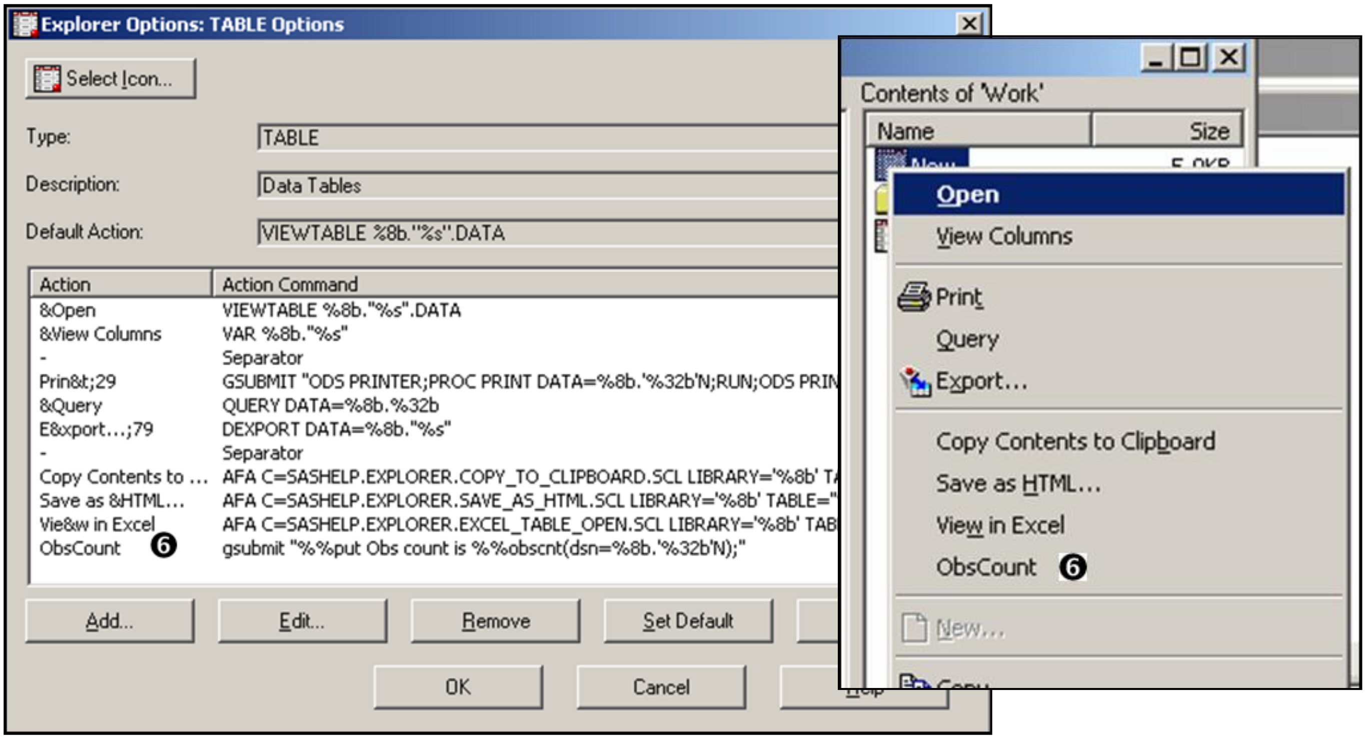


Because the scripting uses the percent sign in the data set name, you must be careful when calling macro language elements from within the GSUBMIT.   This is demonstrated by adding a macro call to the autocall macro %OBSCNT which returns the number of observations in a SAS data set.  If we use it in a %PUT statement the number of observations is written to the LOG.  Notice that the percent signs associated with the macro language are doubled.  This delays their interpretation until the macro statement has been submitted after the data set name has been inserted.  For the data set WORK.NEW the resultant submitted %PUT statement is shown to the right.

```
gsubmit "%%put Obs count is %%obscnt(dsn=%8b.'%32b'N);"
```

```
%put Obs count is %obscnt(dsn=work.new);
```

In the TABLE OPTIONS dialog box shown here, this GSUBMIT has been added to the pop-up menu. ❻



Type: TABLE

Description: Data Tables

Default Action: VIEWTABLE %8b."%s".DATA

| Action | Action Command |
|---|---|
| &Open | VIEWTABLE %8b."%s".DATA |
| &View Columns | VAR %8b."%s" |
| - | Separator |
| Prin&t;29 | GSUBMIT "ODS PRINTER;PROC PRINT DATA=%8b.'%32b'N;RUN;ODS PRIN |
| &Query | QUERY DATA=%8b.%32b |
| E&xport...;79 | DEXPORT DATA=%8b."%s" |
| - | Separator |
| Copy Contents to ... | AFA C=SASHELP.EXPLORER.COPY_TO_CLIPBOARD.SCL LIBRARY='%8b' TA |
| Save as &HTML... | AFA C=SASHELP.EXPLORER.SAVE_AS_HTML.SCL LIBRARY='%8b' TABLE=" |
| Vie&w in Excel | AFA C=SASHELP.EXPLORER.EXCEL_TABLE_OPEN.SCL LIBRARY='%8b' TAB |
| ObsCount ❻ | gsubmit "%%put Obs count is %%obscnt(dsn=%8b.'%32b'N);" |

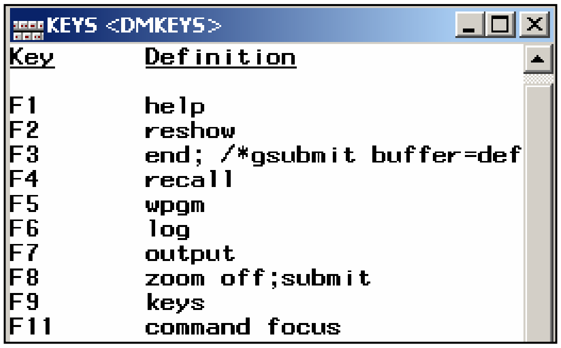
The following GSUBMIT executes the %PRINITIT macro for the displayed data set.  The macro quoting function %NRSTR is used to delay the interpretation of the macro call and may be required when the macro resides in a stored compiled macro library.  For most standard data set names this code can sometimes be simplified by removing the quotes around the data set name(%32b).

```
gsubmit "%%nrstr(%%printit(dsn=%8b.'%32b'N));"
```

```
gsubmit "%%nrstr(%%printit(dsn=%8b.%32b));"
```

## ADDING TOOLS TO THE KEYS LIST

The KEYS window (TOOLS – OPTIONS – KEYS or F9 or KEYS on the command line) lists DM commands that have been pre-assigned to specific key combinations, including function keys and mouse buttons. One of the first sections in this paper showed you how to add commands to keys. The key assignments can also be modified by the user and can include Display Manager commands and even macro calls.



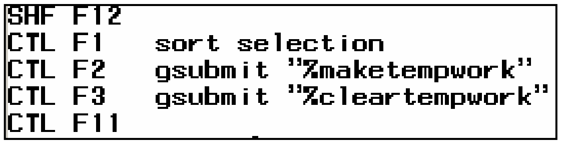
```
Key        Definition

F1         help
F2         reshow
F3         end; /*gsubmit buffer=def
F4         recall
F5         wpgm
F6         log
F7         output
F8         zoom off;submit
F9         keys
F11        command focus
```

The first few key definitions of the KEYS window are shown to the left. Notice that multiple commands can be concatenated with a semi-colon.

You can type in a new command, either by overwriting an existing command or in any available space. As was also shown earlier, commands can also be inserted into the key definitions using KEDYDEF command on a DM statement.

Like in the previous section, if you want to submit code, the GSUBMIT command can be used. In this example the CTL F2 and CTL F3 key combinations have been designated to submit the %MAKETEMPWORK and %CLEARTEMPWORK macro calls. The macro definitions have been saved in the Autocall library so that they can be loaded when the appropriate key combinations are selected.



```
SHF F12
CTL F1     sort selection
CTL F2     gsubmit "%maketempwork"
CTL F3     gsubmit "%cleartempwork"
CTL F11
```

The %MAKETEMPWORK macro creates a directory and assigns the *libref* TEMPWORK to it. When the library is no longer needed, perhaps at the end of the session, the user can press CTL+F3, which executes the macro %CLEARTEMPWORK, which in turn clears the contents of the directory and deletes the directory. Since these macros utilize the %SYSEXEC macro function, the system option NOXWAIT should be declared to prevent prompts from the OS.

```
%macro MakeTEMPWORK;
%local rc;
%let rc=%sysfunc(fileexist("c:\tempwork"));
%if &rc=0 %then %do;
   %sysexec md "c:\tempwork";
   %let rc=%sysfunc(libname(tempwork,c:\tempwork));
%end;
%mend maketempwork;

%macro ClearTEMPWORK;
%local rc;
%let rc=%sysfunc(fileexist("c:\tempwork"));
%if &rc ne 0 %then %do;
   %let rc=%sysfunc(libname(tempwork));
   %sysexec del /Q "c:\tempwork\*.*";
   %sysexec rd /Q "c:\tempwork";
%end;
%mend cleartempwork;
```

Once modified, the new key definitions can be saved using the SAVE command. Key definitions are stored as catalog entries with an entry type of keys. Saved definitions can be recovered through the use of the COPY command.

## SUMMARY

It should be clear from this short introduction to the Display Manager that a great deal more can be done than one might originally think when first starting to use this interactive tool. The many options, menus, tool bars, and even the Enhanced Editor of the Display Manager can all be easily customized to make your work easier.

# ABOUT THE AUTHOR

Art Carpenter's publications list includes five books, and numerous papers and posters presented at SUGI, SAS Global Forum, and other user group conferences. Art has been using SAS® since 1977 and has served in various leadership positions in local, regional, national, and international user groups. He is a SAS Certified Advanced Professional Programmer and through California Occidental Consultants he teaches SAS courses and provides contract SAS programming support nationwide.

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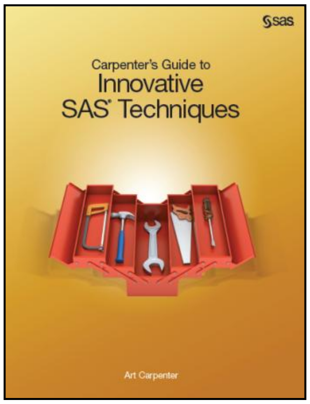
# REFERENCES

Many of the examples in this paper are adapted from *Carpenters Guide to Innovative SAS® Techniques*. https://support.sas.com/pubscat/bookdetails.jsp?pc=62454

The following additional references are listed in roughly the same order as the topics appear in the paper
.

## EXPLORER Window

Richard DeVenezia's website has a useful section on "actions" you might consider adding to the explorer window. http://www.devenezia.com/downloads/sas/actions/



## Function Keys

Rosenbloom, Mary, and Kirk Lafler, 2011, "Assigning a User-defined Macro to a Function Key", published in the proceedings of the 19th Western Users of SAS Software Conference, WUSS, Cary, NC, SAS Institute Inc., Paper 76113. http://www.wuss.org/proceedings11/Papers_Rosenbloom_M_76113.pdf

## Enhanced Editor

A short write-up on select Enhanced Editor keys can be found on the Tek-Tips Forum. http://www.tek-tips.com/faqs.cfm?fid=5140

Usage Note 12392 on locating the Enhanced Editor's AUTOSAVE file can be found at: http://support.sas.com/kb/12/392.html.

Carpenter, Arthur L., 2003b, "Creating Display Manager Abbreviations and Keyboard Macros for the Enhanced Editor", Proceedings of the Twenty-Eighth Annual SAS® Users Group International Conference, Cary, NC: SAS Institute Inc., paper 108. Also in the Proceedings of the Pharmaceutical SAS® Users Group Conference, Cary, NC: SAS Institute Inc. (2004), paper CC25, pp. 127-130. http://www2.sas.com/proceedings/sugi28/108-28.pdf

A collection of Enhanced Editor abbreviations as well as links to other references with more information can be found on the sasCommunity.org article: http://www.sascommunity.org/wiki/Abbreviations/Macros .

## Customizing Tool Bars

Howard, Rob, 2004, "GSUBMIT: Simple Customization of your SAS® Application Toolbar in SAS for Windows® ", published in the proceedings of the Pharmaceutical SAS Users Group Conference, PharmaSUG, Cary, NC: SAS Institute Inc., paper CC19. http://www.lexjansen.com/pharmasug/2004/coderscorner/cc19.pdf

Charlie Huang’s 9/11/2011 blog entry “Add 10 buttons to enhance SAS 9.3 environment” suggests a number of buttons that could be added to the tool bar. http://www.sasanalysis.com/2011/09/10-buttons-to-tweak-sas-93-environmnet.html

Trabachneck, Arthur S., Randy Herbison, Andrew Clapson, John King, Roger DeAngelis, Tom Abernathy, 2010, “Automagically Copying and Pasting Variable Names”, published in the proceedings of the SAS Global Forum 2010 Conference, Cary, NC: SAS Institute Inc., paper 046-2010.
http://support.sas.com/resources/papers/proceedings10/046-2010.pdf

## TRADEMARK INFORMATION