

# Enhancing SAS® Output Tables with WordPerfect®

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## Abstract

Creating tables from SAS output may involve use of some rather detailed WordPerfect code. Once the ground has been broken by producing a few tables, future tables can often be done with only modifications.

Titles can be put in large bold print, employ various font styles and be underlined. The body of the table can be enclosed in an array of vertical and horizontal lines. Shading can be used for emphasis in various elements of the array. Superscripts can be used for footnotes.

In general, tables can be produced by taking the following steps. First prepare the SAS output by inserting tabs for creating columns and writing it to a text file. Next initiate a WordPerfect session and reset defaults to your specific needs. Then invoke WordPerfect menus to create the table, border, a heading with shading and shading for the array's diagonal elements. Finally record these actions into a macro. It can be edited to make changes and additions and can be replayed for similar text files.

This paper summarizes my experiences in learning to use WordPerfect to customize a SAS generated table and then building a WordPerfect macro to automate the process.

## Introduction

When numerous tables are produced for a project, it is useful to have a standard convenient means of placing emphasis on their salient features and optimizing their appearance. WordPerfect is capable of performing these tasks. In the subsequent discussion we will go step by step through the process of building a featured table out of a table created by SAS. Macros can be written for the various tables so that whenever the data are revised and the SAS programs have been rerun, the tables can be reproduced by rerunning the WordPerfect macros. All tables can then be collected into one file and have the pages renumbered by WordPerfect.

## Preparation of the SAS output data

The numbers that make up the rows and columns of the table need to be separated by a tab. An easy way to insert tabs is to write the hexadecimal form of the tab, '09'x, in the output as it is being written by the SAS program. For example, the put statement that writes to

the output file can be written as follows:

```
Put Id1 head. +(-1)'09'x Z1 +(-1)'09'x Z2
              +(-1)'09'x Z3;
              or
Put Id1 head. (Z1-Z3) (+(-1)'09'x);
```

where head. is a format used to put character string descriptors down the left side of the table and Zi, i=1,2... are numbers.

Titles and footnotes should be positioned without centering because centering, bolding, italicizing, setting fonts and font size can be done more efficiently by WordPerfect.

## Document Initialization

Start a WordPerfect session by clicking on the WordPerfect icon. A blank document appears on the screen accompanied by pull-down menus for fonts, font sizes and text alignment as well as a number of buttons such as bold, italic and underline to control the appearance. Bring in the SAS output text file by clicking on FILE and specifying your file as input.

Clicking on format and then clicking on font displays a large menu enabling you to set any one of these and more for the whole document. For example, from the format menu you might choose Courier New in font face, 10 in font size, and in Underline make spaces blank so that spaces between underlined words won't be underlined. These would be in effect for the whole document, but highlighted text can be modified by the buttons or other pull-down menus as the need arises.

In addition to selecting a font under format, you might also do the following:

Format > Line > Spacing.

(This means select the format menu, then the line submenu from it and finally within the submenu, select the spacing entry.)

Set spacing to, say, 0.83. Then OK. Then do:

Format > Margins.

Set top & right margins to 0.25 and the left and bottom margins to 0.5. Then OK.

The result for our example (in which the numbers are

fictitious) is:

TABLE A.1 Relative Shifts in  
Red Blood Cell Count (x1,000,000/mL.)  
REFERENCE RANGE: (3.85 - 5.60)

Baseline	Hospital Admission			Total
	-	0	+	Missing
-	80	39	0	2
0	53	291	7	8
+	1	10	6	0
Missing	4	10	2	5
Total	138	350	15	15

Stuart-Maxwell test: p = 0.60

## Title lines

For titles highlight whatever lines you wish to affect by the pull-down menus or buttons. Then click on Center (in alignment) Bold, Italic and/or Underline. Click to open the font menu and click on the desired font name. Do the same for font size.

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Red Blood Cell Count (x1,000,000/mL.)  
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## Change the Tab Default

Place the pointer to the left of the first line of the table and highlight the whole table, but on the last row do not go beyond the last cell of the array. Then select:

Format > line > Tabset

The tabset menu will appear. In settings put a check mark in Repeat and enter 1.0 after the word, Every. Click on Clear All (not Clear), next on Set and then OK. Without the Clear All, the tab would have its default length which is only 5.

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## Create the Table

Click to remove the highlighting (and to apply the last action) and again highlight the table entries. From the menu select:

Table > Create  
(it should not prompt for # of columns.)

Take the Tabular Column default. Click on OK. The table framework should appear - with one number in each box!

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## Align number entries by decimal point

Place the pointer in the first entry, A1 (i.e., Column A, Row 1). Then select:

Table > Format > Table

In Alignment/Justification choose Decimal Align, then click in column width and type in 1.0. In the Table Position select From Left Edge and type in 1.25 and OK.

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## Make Border and Center the column A entries

Again place pointer in cell A1. From the menu select:

Table > Speed Format

Then select Header Fill Column and click on Apply. Select Table, Format and Column. In Justification select Center and OK. This performs centering for Column A only.

To modify row height select:

Table > Format > Row.

In row height select fixed and set it to 0.26, say.

**TABLE A.1** Relative Shifts in Red Blood Cell Count (x1,000,000/mL.)  
REFERENCE RANGE: (3.85 - 5.60)

Baseline	Hospital Admission				
	-	0	+	Missing	Total
-	80	39	0	2	121
0	53	291	7	8	359
+	1	10	6	0	17
Missing	4	10	2	5	21
Total	138	350	15	15	518

Stuart-Maxwell test: p = 0.60

### Center the column headings in the row 1 entries

Highlight Row 1, then select:

Table > Format > Cell.

In Justification/Justification select Center and OK.

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### Shade in the diagonal entries

Click in cell B2 (and repeat for C3, D4, E5 & F6.) Select:

Table > Lines/Fill,

then inside the cell fill box, click in the box in front of Fill and hold down until you move the cursor to button Fill (row 3, column 1), then release it. Click OK.

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Print the table.

Instead of saving this result in your original text file you may want to specify saving it in a .wpd type file.

### How to create a superscript

Highlight the character(s) to be superscripted. Then select:

Format > Font > Position

and from this menu (3<sup>rd</sup> level down) select Superscript. Subscripts can be created here as well.

Also ®, © and other characters may be inserted by invoking:

Insert > Character

and clicking on one of a few hundred choices.

## How to record the above actions into a WordPerfect macro

The actions just executed by invoking menus generate code which can then be saved and reused or replayed as long as the input files contain the same type of data.

To save this code have the file to be processed present in the WordPerfect document window. Click on the record macro button. It will ask you to supply the name of the macro for saving code to be generated by the actions you are about to perform. All of the actions performed on the document will be recorded until you click on the Stop button which will appear when the recording session begins.

## How to play a macro

Again have the file present in the WordPerfect document window. Position the cursor where it was when you began recording. The upper left hand corner is a good choice. Click on the Play Macro button. If you have several pages of similar tables, the macro may be invoked to run several times before stopping by using the repeat option under Edit. Select:

Edit > Repeat

and fill in the number of times the macro should be execute before stopping.

If you wish to change what has been stored it may be easier to re-record the whole operation instead. Nevertheless the macro may be edited.

## How to edit a macro

Click on the edit macro button, supply the macro name as prompted and the file containing the macro code will be opened. A macro may be written from scratch, but it is far easier to modify already recorded code.

Learning to write WordPerfect macro code can be done by looking at recorded code and making simple changes such as causing an action to be done a line earlier or later, changing fonts or adding a title. Manuals may contain lists of hundreds of macro commands whose names are almost self-explanatory but with little other documentation.

After editing, click on the Options button. It will prompt you to save the macro if you have made any changes and then allow you to close.

To cause each individual action to appear on the screen as it is performed by the macro, include the display

command near the beginning. The syntax is:

Display (ON!)

Display is a very helpful tool to reveal what the macro is actually doing when it is not working properly, yet impressive to watch when it is.

## How to create procedures within a macro to save repeating code

Procedures can be introduced by supplying the procedure and endproc statements, macro code for some task in between and the call statement, for example:

```
Procedure Titl4()
PosLineDown ()
PosLineDown ()
SelectLineDown ()
Font (Name: "Courier New Regular"; Family:
FamilyCourier!; Attributes: FontMatchNormal!;
Weight: 90; Width: WidthUnknown!; Source:
DRSFile!; Type: TrueType!;
CharacterSet: FontMatchASCII!)
FontSize (FontSize: 13p)
AttributeAppearanceOn (Attrib: Bold!)
endproc
...other code...
Titl4()
...other code...
```

The code for creating just the panel (or array)portion of the table above can be put in a procedure so that three panels identical in shape and form can all be put on a single page. The code for a title might be encoded in a procedure for reuse as shown above. My code for the three-panel page through the use of procedures is shorter than the raw code generated by recording the creation of one panel originally.

## Conclusions

WordPerfect has numerous features which can be incorporated into macros for automated processing of tables generated by SAS programs.

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