INTRODUCTION

The Bureau of National Affairs, Inc., located in Washington, D.C., is a publishing concern which provides information services to professionals in business, tax, legal, labor, environment and safety fields. The Sales and Marketing department has a data processing group, Sales and Marketing Information Systems, which uses the SAS® programming language in MVS and PC environment. SAS is used for the reporting and management of sales and marketing data essential in decision making. Several years ago, our unit began experimenting with the SAS® FSLETTER product, as a means of merging subscriber mes with advertising and promotion letters. With the aid of our Systems Support Department, we have been able to create formatted letters which satisfy a very discriminating copy department. The system has replaced an antiquated manual operation which was used to send personalized letters to prospective BNA customers who were receiving a BNA service on a free trial basis. The letters generated are used to encourage those who take one of the BNA services on a forty-five day trial basis to subscribe to that service for a year or more. The system we developed, which is incorporated in a macro, has been in production since 1988. It has proven to be extremely useful, so much so that it has replaced many of the often expensive small personalized promotions which have always been generated out-of-house.

Our objective in this paper is to describe how we incorporated the FSLETTER procedure, several SAS functions, and SAS Macro System in the development of a data-driven personalized letter system which allows the department to not only use the SAS language to manage its marketing database for analysis, but to generate real cost savings by producing quality mailing pieces in-house.

DATABASE DESCRIPTION

The database used for the letter generation is housed in a SAS dataset on an IBM mainframe and is updated weekly. It comes from our online CICS customer database, managed by the Information Systems Development Department. The data is read into an upload file on tape from which our macro pulls the appropriate key, checks for duplicates, updates our letter file, and downloads to a PC SAS® file. The data is stored in upper case and is converted to mixed case in an algorithm described in the subsequent section.

THE MACRO AND THE ALGORITHM

Macro

The system incorporates the use of SAS macros to retrieve the data weekly, reformat the name and address variables into mixed case (a refined letter mode), and print letters for customers whose forty-five day trial period has come to a close. The first macro, "Spirlet", retrieves the account information of the active records coded for the 45 day free trial we are tracking, and stores it in a temporary dataset. The second macro "Hletin" merges the name and address data with the temporary dataset. Following this, the macro "Advlet" extracts the records that have had the free trial for more than 35 days, updates the permanent dataset and calls the macro "Mease". "Mease" converts the data to upper and lower case and prints the appropriate letter. See Appendix A for the macro code.

Algorithm

The Algorithm in "Mease" uses a combination of the Translate, Scan, Substr, Trim, Left, and Index functions to convert the data to upper and lower case. The Scan and Index functions are used to separate each value (company name, address, etc.) into words. The Substr function is used to extract the first letter of the word so that the Translate function converts only the remaining portion of the word into lower case. The Trim and Left Functions are used to remove extra spaces when concatenating the words. (See Appendix B)

FORMATTING QUALITY LETTERS USING MAINFRAME FSLETTER

Carriage Control Commands and Fonts

Carriage control characters are used to designate the spacing throughout the letter. They are keyed in the first column of the document. The standard printer control characters used are:

<table>
<thead>
<tr>
<th>Character</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Overprint (No skip)</td>
</tr>
<tr>
<td>0</td>
<td>Double space</td>
</tr>
<tr>
<td>-</td>
<td>Triple space</td>
</tr>
<tr>
<td>1</td>
<td>Top of page</td>
</tr>
</tbody>
</table>

Use of these characters enables us to use the fonts necessary for the various letter formats. (See Appendix C)

The number of fonts available to us at the present time, is ten. The font is indicated in the second column of the letter. (See Appendix C) Using this format, we are able to bold, use italics and underline.
In addition, the attributes of the variables used in the letter are given in Appendix D. The print file parameters, text body and margin information are found in Appendix E. A sample of the merged letter can be found in Appendix F.

HARDWARE AND OPERATING SYSTEM CONSIDERATIONS

Hardware

Although letters can be produced on most IBM terminals with 24 lines and 80 character width per screen, we had to use the IBM 3278, Model 5 which allows 27 lines and 132 character width per screen. This was due to the fact that the copy was formatted using PC word processing software and the integrity of the copy had to be maintained. The printers available to us are Xerox 8700 and Xerox 4050, mainframe printers.

Job Control Language

In order for the printer to recognize the font criteria, we completed the FCL screen. For TMS Roman Print, point size 11, commands are:

```
PRINT INIT
-..(8U-6ip11.060/0557-8.10o)
```

Printing Letters

To print the letters using the downloaded data, we ran the following from the Program Editor:

```
proc fsletter data = netuser.triallet
letter = netuser.letters.\@\@trix83.letter;
run;
```

A copy of the PC SAS FSLetter screen can be found in Appendix I and a sample of the output can be found in Appendix J.

SUMMARY AND FUTURE APPLICATIONS

Through the use of SAS Macros, SAS datasets, the FSLetter procedure, our Xerox printer and HP Laser Jet IID printer, we have been able to produce a quality product for our advertising department. The cost and time savings alone have made this a much sought after system.

We plan to execute letters not only from our customer database, but from our prospect files and the databases of the company's divisions and subsidiaries. The use of this product has, in some ways, revolutionized the way we use our Marketing database. We will continue to explore new ways to incorporate FSLetter in many of our current database related operations.

---

**Printer Control Language**

```
/ // /FT12F001 DD SYSOUT=(*,5217). Duplex=No,
```

Options "FSP" was necessary to allow batch processing of proc fsl and OPTCD=J referenced the print control language in the body of the letter.

**Fonts**

Fonts were added to a table through a batch job which copied the binary stream of bits to disk. We currently have ten fonts in the table. These are accessed by number in the letter.

**FORMATTING QUALITY LETTERS USING PC FSLetter**

Using the Micro-to-Host Link and the Proc Download procedure, the data is transferred to a PC SAS file. Because of the operating system, DOS, the interactive menus for printer control and fonts are different from the mainframe and require some explanation.

**Printer Selection**

When creating the form entry, the Printer Selection screen requires that you select from a list of printers (See Appendix G).

**Font Control Information**

We selected fonts based on what was available on the HP Laser Jet IID. It was necessary to refer to the printer manual and print a font list which gave the appropriate escape sequences before proceeding to the Font Control Screen. By using various colors, we were able to indicate underline, bold, and italic print types (See Appendix H).
Appendix D

FLETTER attribute screen

Symbolic name: SUBNAME

Value attributes: 
- Lastname
- Right Justify
- Flow after
- X Delete
- Required
- Flow before

Field color: B = Green, Bblue, Blue, F = Pink, C = Cyan, Y = Yellow, W = White

Field attr: H = Highlight, R = Reverse video, B = Bold, U = Underline

SAS Variable aliases: SUBNAME

Appendix E

Text Body and Margin Information

Characters per line: 81

Text Body Information

Lines on First Page: 63
Lines on Following: 63

First Page Margins
- Left: 3
- Top: 3
- Bottom: 3

Following Pages
- Left: 3
- Top: 3
- Bottom: 3

IBM Print File Parameters

Destination: SALPRINT

Class: A
Program: 

Copies: 1

Carriage control Information

No CC: X

First Print Control Language: X
First Text Page: X
Following Print Control Language: X
Following Text Pages: X

Additional information needed only for IBM S/360 printers

Character Tables: 
Flash Name: 
Flash Count: 
Modify Name: 
Modify Trie: 

831
March 17, 1992

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for the Editors

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# FSLETTER: FORM2.FORM
Command: =>

NOTE: Please select a printer.

Target operating system: DOS
Form description: FORMLET.FORM

Please select one printer: Scroll down for more

- Epson MX-80/100
- Hewlett-Packard LaserJet(+)
- Hewlett-Packard LaserJet(+) Courier 10
- Hewlett-Packard LaserJet(+) Prestige 11
- Hewlett-Packard QuietJet, Alternate mode
- Hewlett-Packard QuietJet, HP mode
- Hewlett-Packard ThinkJet
- IBM 3800
- IBM 3812
- IBM 6670
- IBM Proprinter
- IBM Quietwriter 5201

Appendix G

## FONT CONTROL INFORMATION

<table>
<thead>
<tr>
<th>Character Number</th>
<th>Description</th>
<th>Character Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Escape</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Color Attribute

- RED
  - REVERSE: Start: "60B"
  - Stop: "4d#"
  - Desc: Underline

- BLUE
  - HIGHLIGHT: Start: "33B"
  - Stop: "7e#"
  - Desc: BOLD

- YELLOW
  - Start: ";s18"
  - Stop: ";008"
  - Desc: Italic

-                  
  - Start:                
  - Stop:                
  - Desc:                

Scroll down for more
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March 19, 1992

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Independence, MO 64051

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