
SAS/AF Graphics Device Application

Purpose:

The purpose of this paper is to describe a SAS/AF application that is designed to provide users with a menu to easily select graphic output devices, printer type and destination, and other graphic options. It automatically sets defaults based on the system USERID. This is included as part of a materials testing application, but would function with any application.

Scope:

The user needs to be able to select graphics devices, printers, destinations, and copies from a easy to use menu without knowing technical terms.

The user can view many different graphs. There is a need to sometimes send graphs to the screen, printer, or plotter. Also, it would be advantageous to print copies of graphs currently displayed on the screen.

Furthermore, it is necessary for the user to specify the number of copies to be printed. It would also be helpful to automatically set default devices, types of graphic printers, destination (printer ID), and HPOS and VPOS defaults.

Solution:

Use SAS/AF to create a menu within the application to accomplish the required task.

This graphics device application menu must be able to be used in other applications.

Approach:

Provide a screen to display users defaults and allow user to modify parameters as needed.

The INIT portion of the SAS/AF Source code will check the system user ID and set defaults accordingly.

The MAIN portion will allow the user to modify parameters.

The TERM portion will set the requested parameters (i.e. GOPTIONS).

Provide for a message to be displayed showing the current graphic options both on the user menu and later of graphics request screens.

Also, edit fields for valid entry values whenever practical.

Approach:

Use SAS/AF functions to determine USERID and compare returned value with a SAS datasets to obtain the graphic output defaults.

Use Program Submit Blocks to set the desired GOPTIONS.

Use a global variable to capture the appropriate message showing the current graphics parameters.

Provide a FSEDIT procedure to add, modify, or delete USERID defaults.

Use Targetdevice statement to enable screen view prints.

SAS/AF Code:

Attachment A:

???? Window shows user menu for setting graphics options.

Attachment B:

ATTR Window for each Variable on ???? Window.

Attachment C:

Source Window with the SAS/AF code.

Attachment D:

Example of Graphics Request Screen with message.

Attachment E:

Examples of graphic outputs on screen, printer, and plotter.

Development:

The development of this application required approximately 20 hours. It was first accomplished using IF statements rather than looking up defaults on a SAS dataset.

Determining the desired GOPTIONS required approximately 25 percent of the time. Also, determining when to use CONTROL statements required debugging time.

Conclusion:

Using SAS/AF to set Graphic Options provided an easy to use menu for users. It automatically sets the defaults desired by users as well as the ability for the user to quickly change any or all parameters.

The use of a SAS dataset to store USERID defaults enables easily non-programming maintenance.

As time permits, code will be added in the graphic requests screens to call this graphics device screen directly.

Provisions will also be added to set HPOS and VPOS parameters and set plotter options.

SAS/AF is a product of the SAS Institute Inc. at Cary, North Carolina.

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DMW

+BUILD: DISPLAY DEVOUT2.PROGRAM (E)-

R -----

+BUILD: DISPLAY DEVOUT2.PROGRAM (E).

ATTACHMENT B

+BUILD: DISPLAY DEVOUT2.PROGRAM (E)-----+

Command ==>

+BUILD: SOURCE DEVOUT2.PROGRAM (E)-----+

Command ==>

```
00001
00002 INIT:
00003
00004 CONTROL ASIS ENTER;    *** PROCESS WITHOUT INPUT ***;
00005
00006 CURSOR DIS;
00007 D = ' ';
00008 CALL SETFKEY(FKEYNAME(3),'CANCEL');
00009
00010
00011 *** SET DEFAULTS OUTPUT DEVICES BASED ON USERID ***;
00012 SUBMIT CONTINUE;
00013     DATA USERID;
00014     SET TESTMPR.USERID;
00015     FORMAT USER $CHAR8. USER45 DT $CHAR2. FIRST $CHAR1.;
00016
```

R

ATTACHMENT C

-----+
Command ==>

MIRSAS:DENG2

BITUMINOUS MIXTURES
BITUMINOUS MIXTURE DENSITIES BY DATE GRAPH

RESPONSIBLE LOCATION:	96_	(e.g. 91-99)
CONTRACT NO.-----:	ALL	(e.g. 96374)
MIXTURE PLANT-----:	ALL	(e.g. 1202-04)
BEGIN MATERIAL CODE-:	17552	(e.g. 17562)
ENDING MATERIAL CODE:	17552	(e.g. 17565)

ENTER THE ABOVE DESIRED PARAMETERS.

GRAPH(S) DISPLAY ON SCREEN. TYPE "PRINT" AT ==> TO PRINT A GRAPH

<PF15=SUBMIT> <PF3=END>

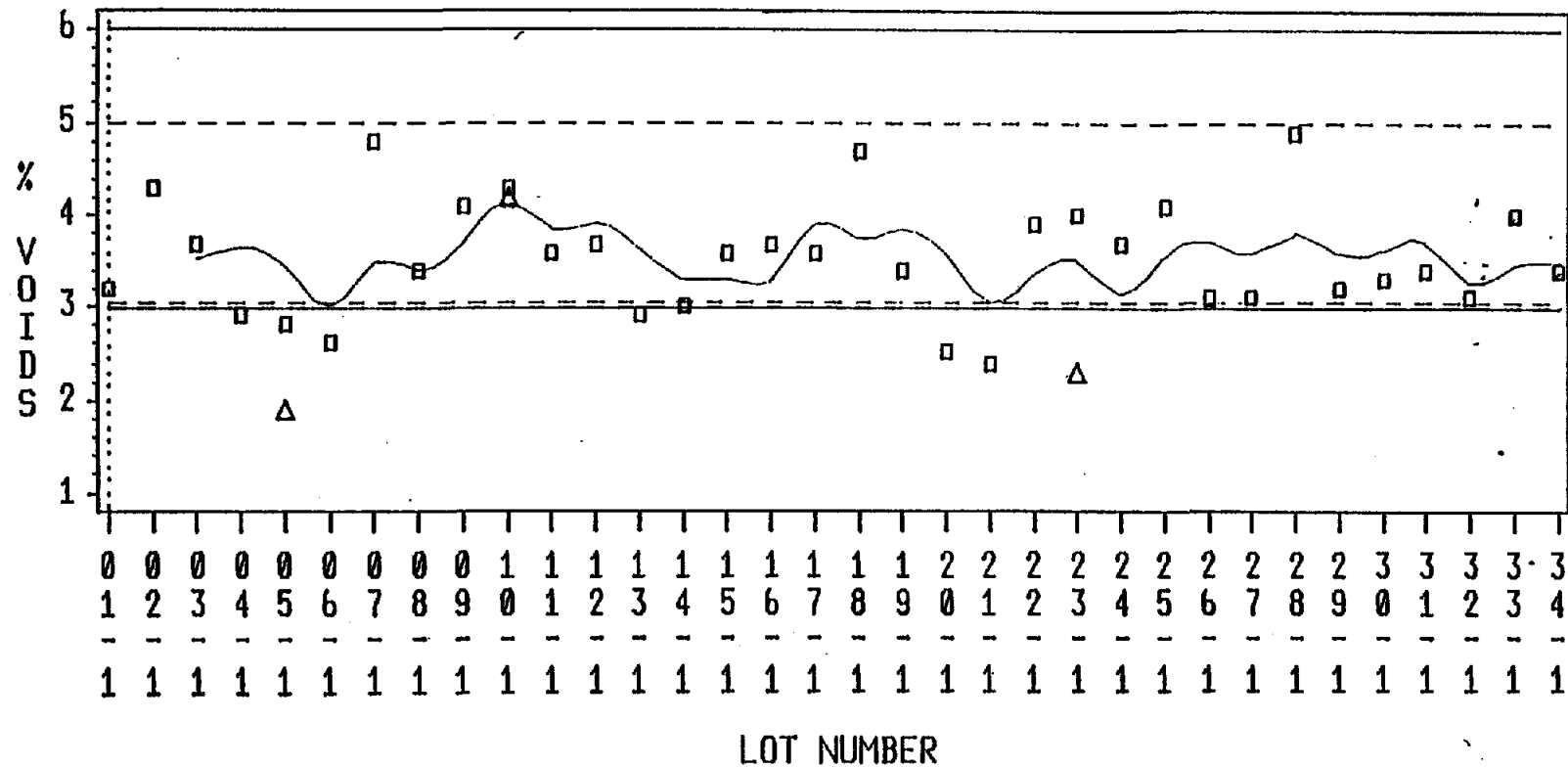
-----+
ATTACHMENT D

QC/QA MARSHALL TESTS

PERCENT VOIDS

PRODUCER=Z

MIXTURE=BINDER



LEGEND: □ □ □ PRO-WASHED
 --- UCL AVG-4
 — LCL INDIV

— PRO 4-DAY AVG
 --- LCL AVG-4

Δ Δ Δ IDOT TEST
 — UCL INDIV

+MIRSAS:MIR1-

MISTIC-SAS MAIN MENU

AGGREGATE

BIT MIXTURE

PCC MIXTURE

MISCELLANEOUS

PRINT/DISPLAY

UTILITIES

EXIT

Place cursor on your selection and press the enter key.

ATTACHMENT F (1)

+MIRSAS:MIRBIT2A-

BITUMINOUS MIXTURE GRAPH MENU

EXT/HB PLOTS

EXT/HB -200/V

EXT FORM DEV

EXT VOIDS

DENSITY-DATE

DENSITY-HISTO

MAIN MENU

Place cursor on your selection and press the enter key.

ATTACHMENT F (2)

MIRSAS:DEVOUT2 SELECT GRAPHICS OUTPUT DEVICE

- ENTER DESIRED DISTRICT 91-99 TO SET OUTPUT DEFAULTS.
ENTER 'XX' IN DISTRICT TO USE VALUES OTHER THAN DEFAULTS.
SELECT OUTPUT DEVICE SCREEN, PRINTER, OR PLOTTER.

<PF15=SUBMIT> <PF3=QUIT> <Press ENTER to view changes>

ATTACHMENT F (3)

Command ==>

MIRSAS:DEVOUT2 SELECT GRAPHICS OUTPUT DEVICE

- ENTER DESIRED DISTRICT 91-99 TO SE +-----
 ENTER 'XX' IN DISTRICT TO USE VALUES OTHER THAN DEFAULTS.
 SELECT OUTPUT DEVICE SCREEN , PRINTER, OR PLOTTER.

<PF15=SUBMIT> <PF3=QUIT> <Press ENTER to view changes>

ATTACHMENT F (4)

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.....
Command ==>

MIRSAS:DEVOUT2      SELECT GRAPHICS OUTPUT DEVICE

1. SELECT DISTRICT (SETS DEFAULT):  50          (91-99, 50, XX)
2. SELECT DESIRED OUTPUT DEVICE--:  SCREEN      (? FOR LIST)
3. GRAPHICS TERMINAL TYPE -----:  +Select Data-----+
                                     Command ==>
4. PRINTERS:
   MODEL -----:  IB
   PRINTER IDENT (DESTINATION)--:  DT
   NUMBER COPIES OF GRAPH-----:
                                     Make one selection.
                                     IBM3179
                                     IBM3472
                                     IBM3279
                                     GDDMPCG
                                     NONE
ENTER DESIRED DISTRICT 91-99 TO SE
ENTER 'XX' IN DISTRICT TO USE VALUE
SELECT OUTPUT DEVICE SCREEN , PRINT
GRAPH(S) DISPLAY ON SCREEN. TYPE "P"
<PF15=SUBMIT> <PF3=QUIT> <Press ENTER to view changes>
.....

```

ATTACHMENT F (5)

```

.....
Command ==>

MIRSAS:DEVOUT2      SELECT GRAPHICS OUTPUT DEVICE

1. SELECT DISTRICT (SETS DEFAULT):  50          (91-99, 50, XX)
2. SELECT DESIRED OUTPUT DEVICE--:  SCREEN      (? FOR LIST)
3. GRAPHICS TERMINAL TYPE -----:  IBM3472      (e.g. IBM3472)
                                     (GDDMPCG SCREEN/PLOT - PF4)
4. PRINTERS:
   MODEL -----:  +Select Data-----+
   PRINTER IDENT (DESTINATION)--:  DT      Command ==>
   NUMBER COPIES OF GRAPH-----:
                                     Make one selection.
                                     IBM3287
                                     IBM4224
                                     NONE
ENTER DESIRED DISTRICT 91-99 TO SE
ENTER 'XX' IN DISTRICT TO USE VALUE
SELECT OUTPUT DEVICE SCREEN , PRINT
GRAPH(S) DISPLAY ON SCREEN. TYPE "P"
<PF15=SUBMIT> <PF3=QUIT> <Press ENTER to view changes>
.....

```

ATTACHMENT F (6)

```

-----
Command ==>

MIRSAS:DEVOUT2      SELECT GRAPHICS OUTPUT DEVICE

1. SELECT DISTRICT (SETS DEFAULT):  50      (91-99, 50, XX)
2. SELECT DESIRED OUTPUT DEVICE--:  SCREEN  (? FOR LIST)
3. GRAPHICS TERMINAL TYPE -----:  IBM3472  (e.g. IBM3472)
                                         (GDDMPCG SCREEN/PLOT - PF4)
4. PRINTERS:
   MODEL -----:  IBM3287  (IBM3287, IBM4224)
   PRINTER IDENT (DESTINATION)-:  DTP65004  (e.g. DTP65004)
   NUMBER COPIES OF GRAPH-----:    1      (1-10)

ENTER DESIRED DISTRICT 91-99 TO SET OUTPUT DEFAULTS.
ENTER 'XX' IN DISTRICT TO USE VALUES OTHER THAN DEFAULTS.
SELECT OUTPUT DEVICE SCREEN , PRINTER, OR PLOTTER.

GRAPH(S) DISPLAY ON SCREEN. TYPE "PRINT" AT ==> TO PRINT A GRAPH

<PF15=SUBMIT> <PF3=QUIT> <Press ENTER to view changes>
-----

```

ATTACHMENT F (7)

START SAS/AF

+LOG-----	+MEMLIST: DOT9??S+
Command ==>	Command ==>
NOTE: AUTOEXEC processing completed.	Name
	- AAMENU
	- AATEST
	- AGGCNTVD
	- AGGCNT2
	- AGGMERG
	- AGGOUT
	- AGGQUAL1
	- ALLOC
	- BIRPROM2
	- BITPRODM
	- BITPRODT
	- BITPROM2
	- BUILD
	- BUILDB
	- CCERT
	- CCERTP
	- CCERTP2
	- CCERTRPT
+PROGRAM EDITOR-----	
Command ==>	
00001	
00002	
00003	
00004	
00005	
00006	

ATTACHMENT G

```

+LOG-----+MEMLIST: DOT9??S+
Command ==>
Command ==>

NOTE: AUTOEXEC processing completed.

Name
- AAMENU
- AATEST
- AGGCNTVD
- AGGCNT2
- AGGMERG
- AGGOUT
- AGGQUAL1
- ALLOC
- BIRPROM2

+PROGRAM EDITOR-----
Command ==>

00001
00002 *** BUILD      EXAMPLE PROC BUILD  ***;
00003 PROC BUILD C=TESTMPR.AF1;
00004 RUN;
00005
00006

```

ATTACHMENT G

```

+BUILD: DIRECTORY TESTMPR.AF1 (E)-----
Command ==>

```

Name	Type	Description	Updated
- AGGCERTG	PROGRAM	AGGCERTG.PROGRAM	11/19/91
- AGGCERTT	PROGRAM	AGGCERTT.PROGRAM	10/06/91
- AGGEXP1	PROGRAM	AGGEXP1.PROGRAM	12/04/91
- AGGFILE1	PROGRAM	AGGFILE1.PROGRAM	12/20/91
- AGGPLOT	PROGRAM	AGGPLOT.PROGRAM	12/02/91
- AGGQUAL1	PROGRAM	AGGQUAL1.PROGRAM	12/09/91
- AGGSTAT	PROGRAM	AGGSTAT.PROGRAM	11/20/91
- AGGVIEW2	PROGRAM	AGGVIEW2.PROGRAM	11/20/91
- BITSTAT	PROGRAM	BITSTAT.PROGRAM	11/20/91
- DENG1	PROGRAM	DENG1.PROGRAM	11/19/91
- DENG2	PROGRAM	DENG2.PROGRAM	11/19/91
- DENVIEW	PROGRAM	DENVIEW.PROGRAM	11/20/91
- DEVLIST	PROGRAM	DEVLIST.PROGRAM	07/14/91
- DEVOUT	PROGRAM	DEVOUT.PROGRAM	11/20/91
- DEVOUT2	PROGRAM	DEVOUT2.PROGRAM	12/20/91
- GR20N07M	PROGRAM	GR20N07M.PROGRAM	07/07/91
- MB13VIEW	PROGRAM	MB13VIEW.PROGRAM	12/15/91
- MIR	PROGRAM	MIR.PROGRAM	11/19/91

ATTACHMENT G

```

INIT:

CONTROL ASIS ENTER;    *** PROCESS WITHOUT INPUT ***;

CURSOR DIS;
D = '  ';
CALL SETFKEY(FKEYNAME(3),'CANCEL');

*** SET DEFAULTS OUTPUT DEVICES BASED ON USERID ***;
SUBMIT CONTINUE;
  DATA USERID;
    SET TESTMPR.USERID;
    FORMAT USER $CHAR8. USER45 DT $CHAR2. FIRST $CHAR1.;

    *** GET USERID AND SUBSTRING DISTRICT ***;
    IF FIRST NE 'N' THEN
      DO;
        FIRST = 'N';
        USER = SYMGET('SYSJOBID');
        USER45 = SUBSTR(USER,4,2);
      END;

    *** SET D (DISTRICT SCREEN DEFAULT) ***;
    IF USER45 >= '91' AND USER45 <= '99' THEN DT = USER45;
    ELSE DT = '50';

    *** SET DEFAULT TYPE PRINTER/CRT AND PRINTER ID ***;
    IF SASUSER = USER;    *** SELECT USERID ***;
    KEEP SASUSER CRT PRT PRTID RESP
      LOCATION CONTACT USER USER45 DT;

  RUN;
ENDSUBMIT;

DSID = OPEN('USERID','I');    *** ACCESS WORK.USERID ***;
RC = FETCHOBS(DSID,1);
GT = GETVARC(DSID,2);
PT = GETVARC(DSID,3);
PID = GETVARC(DSID,4);
D = GETVARC(DSID,5);
RC = CLOSE(DSID);

```

```

*** SET MESSAGE                                     ***;
IF DIS = 'PRINTER' THEN
MSG1 = GC || ' COPY(S) WILL GOTO DIST ' || D || ' ' || PT || ' AT ' || PID;
ELSE
IF DIS = 'PLOTTER' THEN
MSG1 = 'GRAPH(S) WILL DISPLAY ON SCREEN, PRESS PF4 KEY TO PLOT';
ELSE
IF DIS = 'SCREEN' THEN
MSG1 = 'GRAPH(S) DISPLAY ON SCREEN. TYPE "PRINT" AT ==> TO PRINT A GRAPH';

```

```

*** INITIAL SET TO PRINTER ***;

```

```

IF PT = 'IBM4224' THEN
DO;
SUBMIT CONTINUE;
GOPTIONS DEVICE=GDDM4224 CHARTYPE=2
GCLASS=S GSFLN=500 GACCESS=GSASFILE
DEVADDR=(SAS,..,&PID) GDEST=&PID
TARGETDEVICE=IBM4224;
GOPTIONS HPOS=0 VPOS=0 CBY=RED;
ENDSUBMIT;
END;

```

```

IF PT = 'IBM3287' THEN
DO;
SUBMIT CONTINUE;
GOPTIONS DEVICE=IBM3287F CHARTYPE=2 GCLASS=S
DEVADDR=(SAS,..,&PID) GDEST=&PID
TARGETDEVICE=IBM3287F GACCESS=GSASFILE GSFLN=500;
GOPTIONS HPOS=0 VPOS=0 CBY=RED;
ENDSUBMIT;
END;

```

```

RETURN;

```

```

MAIN:

```

```

IF D NE 'XX' THEN

```

```

DO;

```

```

SUBMIT CONTINUE;

```

```

DATA USERID;

```

```

SET TESTMPR.USERID;

```

```

FORMAT USER $CHAR8. USER45 DT $CHAR2. FIRST $CHAR1.;

```

```

*** GET USERID AND SUBSTRING DISTRICT ***;

```

```

IF FIRST NE 'N' THEN

```

```

DO;

```

```

FIRST = 'N';

```

```

USER = SYMGET('SYSJOBID');

```

```

USER45 = SUBSTR(USER,4,2);

```

```

END;

```

```

*** SET D (DISTRICT SCREEN DEFAULT) ***;
IF USER45 >= '91' AND USER45 <= '99' THEN DT = USER45;
ELSE DT = '50';

```

```

*** SET DEFAULT TYPE PRINTER/CRT AND PRINTER ID ***;
IF RESP = &D ; *** SELECT USERID ***;
KEEP SASUSER CRT PRT PRID RESP
LOCATION CONTACT USER USER45 DT;

```

```

RUN;
ENDSUBMIT;

```

```

DSID = OPEN('USERID','I');
RC = FETCHOBS(DSID,1);
GT = GETVARC(DSID,2);
PT = GETVARC(DSID,3);
PID = GETVARC(DSID,4);
D = GETVARC(DSID,5);
RC = CLOSE(DSID);
END;

```

```

IF DIS = 'PRINTER' THEN
MSG1 = GC || ' COPY(S) WILL GOTO DIST ' || D || ' ' || PT || ' AT ' || PID;
ELSE
IF DIS = 'PLOTTER' THEN
MSG1 = 'GRAPH(S) WILL DISPLAY ON SCREEN, PRESS PF4 KEY TO PLOT';
ELSE
IF DIS = 'SCREEN' THEN
MSG1 = 'GRAPH(S) DISPLAY ON SCREEN. TYPE "PRINT" AT ==> TO PRINT A GRAPH';
CALL SYMPUTC('MSGG',MSG1);
RETURN;

```

```

TERM:
IF _STATUS_ = 'C' THEN
DO;
_STATUS_ = 'H';
GOTO SKIP;
END;
** SET GRAPHICS TERMINAL ***;
IF DIS = 'PLOTTER' THEN GOTO PLOT;
IF DIS = 'SCREEN' THEN GOTO CRT;

```

*** PRINTER ***;

IF PT = 'IBM4224' THEN

DO;

SUBMIT CONTINUE;

GOPTIONS DEVICE=GDDM4224 CHARTYPE=2

GCLASS=S GSFLN=500 GACCESS=GSASFILE

DEVADDR=(SAS,..,PID) GDEST=&PID

TARGETDEVICE=IBM4224;

GOPTIONS HPOS=0 VPOS=0 CBY=RED;

ENDSUBMIT;

END;

IF PT = 'IBM3287' THEN

DO;

SUBMIT CONTINUE;

GOPTIONS DEVICE=IBM3287F CHARTYPE=2 GCLASS=S

DEVADDR=(SAS,..,PID) GDEST=&PID

TARGETDEVICE=IBM3287F GACCESS=GSASFILE GSFLN=500;

GOPTIONS HPOS=0 VPOS=0 CBY=RED;

ENDSUBMIT;

END;

GOTO VEND;

CRT:

IF PT = 'IBM4224' THEN

DO;

SUBMIT CONTINUE;

GOPTIONS TARGETDEVICE=IBM4224

HPOS=0 VPOS=0 CBY=RED;

ENDSUBMIT;

END;

IF PT = 'IBM3287' THEN

DO;

SUBMIT CONTINUE;

GOPTIONS TARGETDEVICE=IBM3287F

HPOS=0 VPOS=0 CBY=RED;

ENDSUBMIT;

END;

```
SUBMIT CONTINUE;
  GOPTIONS DEVICE = &GT;
  GOPTIONS HPOS=0 VPOS=0 CBY=RED
    GACCESS=GSASFILE GSFLLEN=500 GCLASS=S;
ENDSUBMIT;
GOTO VEND;

PLOT:
  SUBMIT CONTINUE;
  GOPTIONS DEVICE=GDDMPCG GDDMNICKNAME=* DEVADDR=(...,PLOTB);
  GOPTIONS HPOS=90 VPOS=90 CBY=RED ;
ENDSUBMIT;
GOTO VEND;

VEND:
  SUBMIT CONTINUE;
  GOPTIONS GCOPIES=(20,&GC);
ENDSUBMIT;

SKIP:

RETURN;
```