CHAPTER

15

The GDEVICE Procedure

Overview

The GDEVICE procedure is a tool for examining and changing the parameters of the graphics device driver catalog entries used with SAS/GRAPH software. With the GDEVICE procedure, you can use either the GDEVICE windows or GDEVICE procedure statements to

- □ list the device entries stored in any DEVICES catalog
- □ view the parameters for any device entry
- □ create and modify new device entries
- □ copy, modify, rename, or delete existing device entries.

See Chapter 3, “Device Drivers,” on page 37 for a discussion of device drivers and device entries, as well directions for selecting device drivers and changing the settings of device parameters.

For a complete list of Institute-supplied device entries supported by your operating environment, see the SASHELP.DEVICES catalog that is supplied with SAS/GRAPH software.

Concepts

About Device Catalogs

Device entries are stored in SAS catalogs that are named *libref*.DEVICES. Device entries for your operating environment that are supplied with SAS/GRAPH software are stored in the Institute-supplied catalog, SASHELP.DEVICES.

Custom device entries are typically stored in a catalog named GDEVICE*n*.DEVICES (where *n* can be any number from 0 to 9). However, device entries that have been created or modified by a system administrator specifically for your site also may be stored in SASHELP.DEVICES. (On multi-user systems, the SAS Support Consultant is usually the person who has write access to the SASHELP.DEVICES catalog and makes any changes.)

About the Current Catalog

When the GDEVICE procedure determines which catalog it should use, it searches for the catalog in the following order:

1. the catalog name specified in the CATALOG= option in the PROC GDEVICE statement
2. the catalog associated with the GDEVICE0 libref, if the libref has been assigned
3. the Institute-supplied catalog, SASHELP.DEVICES. (SASHELP.DEVICES is usually write-protected and is opened in browse mode.)

The first catalog it finds becomes the current catalog.

You can specify the current catalog by

- □ using the CATALOG= option in the PROC GDEVICE statement (this is required to open a driver entry in update mode)
- □ assigning the GDEVICE0 libref to the appropriate catalog.

Search Order of Device Catalogs

When you specify a device driver, SAS/GRAPH software looks only into catalogs with certain librefs and names to find a device entry for that driver. It searches these catalogs sequentially in the following order:

1. If the libref GDEVICE0 has been assigned to a SAS library, SAS/GRAPH software looks in that library for a catalog named DEVICES. If the GDEVICE0.DEVICES catalog exists, it is checked for the specified device entry. If the device entry is not there, SAS/GRAPH software looks next for a library with the libref GDEVICE1 and for a catalog named DEVICES in that library. The search is repeated for the sequence of librefs through GDEVICE9.
2. If SAS/GRAPH fails to find the specified device entry in any DEVICES catalog in the libraries GDEVICE0 through GDEVICE9, or if before locating the specified device entry it encounters in that sequence an undefined libref or a library that does not contain a DEVICES catalog, it jumps to SASHELP.DEVICES to search for the device entry. For example, if a GDEVICE0 libref is allocated but this library does not contain a DEVICES catalog, SAS/GRAPH software jumps to the SASHELP.DEVICES catalog, without searching for a GDEVICE1.DEVICES catalog, even if it exists. (SASHELP.DEVICES is the device catalog supplied with SAS/GRAPH software. SASHELP is one of the standard librefs defined automatically whenever you start your SAS session; you do not need to issue a LIBNAME statement to define it.)
3. If the specified device entry is not found in the SASHELP.DEVICES catalog, you receive an error message.

Since the GDEVICE0.DEVICES catalog is the first place that SAS/GRAPH software looks, you always should assign that libref to the library containing your personal catalog of device entries, if you have one. If for some reason you have personal device catalogs in more than one SAS data library, assign them librefs in the sequence GDEVICE0, GDEVICE1, GDEVICE2, and so on.

Note: As stated above, the search for entries terminates if there is a break in the sequence; the catalog GDEVICE1.DEVICES is not checked if the libref GDEVICE0 is undefined, or if GDEVICE0 does not contain a catalog named DEVICES. △

To cancel or redefine the libref GDEVICE*n*, first clear the current graphics options:

```
goptions reset=all;
```

You can then redefine the libref with another LIBNAME statement. To cancel a libref, use a null LIBNAME statement.

Ways to Use the GDEVICE Procedure

There are two ways to use the GDEVICE procedure:

- □ browse or edit the fields in the GDEVICE procedure windows (windowing mode)
- □ submit GDEVICE procedure statements in a SAS program (program mode).

If you run SAS software in a windowing environment (the SAS Display Manager System, for example), you can use either the GDEVICE procedure windows or the GDEVICE procedure statements. In a windowing environment, the GDEVICE procedure automatically opens the GDEVICE procedure windows.

If you run SAS software in a non-windowing environment (such as line-mode or batch), you can use only GDEVICE procedure statements. In a non-windowing environment, the GDEVICE procedure automatically uses program mode.

Both methods provide identical functionality and allow you to display or modify device parameters, or create new device entries.

Windowing Mode

In a windowing environment, open the GDEVICE windows by submitting the PROC GDEVICE statement without the NOFS option:

```
proc gdevice;
```

This opens the DIRECTORY window in browse mode. This window lists all of the device entries in the current catalog. (See "About the Current Catalog" on page 652.)

To open the DIRECTORY window in edit mode, or to specify a different catalog, include the CATALOG= option in the PROC GDEVICE statement.

From the DIRECTORY window you can select the device entry you want to work with and open other GDEVICE windows in which you can view or modify device parameters. For more information, see "Using the GDEVICE Windows" on page 664.

In a windowing environment, you can switch between the GDEVICE windows and program statements while you are running the procedure. See the "FS Statement" on page 661 and the NOFS window command in the SAS Help facility for SAS/GRAPH.

To exit the GDEVICE windows, submit the End command or close the window.

Program Mode

If you are in a non-windowing or batch environment, the GDEVICE procedure automatically starts in program mode. If you are in a windowing environment, specify the NOFS option to start the GDEVICE procedure in program mode:

```
proc gdevice nofs;
```

By default, the GDEVICE procedure accesses the current catalog in browse mode and prompts you in the LOG to enter additional program statements. (See "About the Current Catalog" on page 652.) To specify the current catalog, include the CATALOG= option in the PROC GDEVICE statement.

Once you start the GDEVICE procedure, you can enter and run additional statements without re-entering the PROC GDEVICE statement. For example, the following statement generates a listing of the device parameters for the PSCOLOR device entry that is stored in the Institute-supplied catalog, SASHELP.DEVICES:

```
list pscolor;
```

PROC GDEVICE procedure output is displayed in the Output window. Output 15.1 on page 654 shows the listing generated by the LIST statement.

Output 15.1 Sample Device Entry Listing Generated in Program Mode

```
                           GDEVICE procedure
              Listing from SASHELP.DEVICES - Entry PSCOLOR

Orig Driver: PSCOLOR            Module:   SASGDPSL  Model:     1251
Description: PostScript color--RGB color defs            Type: PRINTER
*** Institute-supplied ***
Lrows:   0  Xmax:   8.500 IN    Hsize:    8.000 IN  Xpixels:       2550
Lcols:   0  Ymax:  11.000 IN    Vsize:    8.500 IN  Ypixels:       3300
Prows:  68                      Horigin:  0.218 IN
Pcols:  80                      Vorigin:  1.496 IN
Aspect:   0.000                 Rotate:
Driver query: Y                 Queued messages: N
                                Paperfeed:   0.000 IN

OPTIONS

Erase:                   Autofeed:      Y         Chartype:    1
Swap:                    Cell:                    Maxcolors: 256
Autocopy:                Characters:              Repaint:     0
Handshake:     XONXOFF   Circlearc:               Gcopies:     0
                         Dash:                    Gsize:       0
Prompt - startup:        Fill:                    Speed:       0
       end graph:        Piefill:                 Fillinc:     0
       mount pen:        Polyfill:                Maxpoly:  1450
       chg paper:        Symbol:                  Lfactor:     0
                         Pensort:       N
Promptchars:  '000A010D05000000'X
Devopts:      'FD9230402C130000'X
UCC:      '0001'X

Cback:      WHITE
Color list:

  BLACK     RED       GREEN     BLUE      CYAN
  MAGENTA   YELLOW    GRAY

CHARTYPE RECORDS

Chartype Rows  Cols                 Font Name                 Scalable
     1     89    85   Courier                                     Y
     2     89    85   Courier-Oblique                             Y
     .
     {ob ...more hardware fonts...}
     .
    34     89    85   Bookman-LightItalic                         Y
    35     89    85   Bookman-DemiItalic                          Y
Gend:     '0A'X

FILE INFORMATION

Gaccess:    sasgastd>sasgraph.ps
Gsfname:                        Gsfmode:  PORT      Gsflen:       0
Trantab:                        Devmap:
Devtype:    DISK
Gprotocol:
Fileclose:  DRIVERTERM
Hostspec:

HOST INFORMATION
```

You can exit the GDEVICE procedure in these three ways:

□ Submit the END, QUIT, or STOP statement.

□ Submit another PROC statement or DATA step.

□ Exit your SAS session.

Procedure Syntax

Requirements: Statements other than the PROC GDEVICE statement can be used only in a non-windowing or batch environment. In these environments, at least one statement is required to give GDEVICE an action to perform. In a windowing environment, only the PROC GDEVICE statement is required. In program mode, at least one additional statement is required, and you can submit as many of each statement as you want.

Note: You must have write access to the device catalog in order to modify, add, or delete entries.

Supports: Output Delivery System (ODS LISTING).

PROC GDEVICE <CATALOG=<*libref.*>*SAS-catalog*>
<BROWSE>
<NOFS>;

ADD*new-device-entry*
required-parameters
<*optional-parameters*>;

COPY*device-entry*
<FROM=<*libref.*>*SAS-catalog*>
<NEWNAME=*new-device-entry*>;

DELETE *device-entry*;

FS;

LIST *device-entry* | _ALL_ | _NEXT_ | _PREV_ | DUMP>;

MODIFY *device-entry*
parameter(s)

QUIT | *END* | *STOP*;

RENAME *device-entry* NEWNAME=*new-entry-name*;

PROC GDEVICE Statement

Starts the procedure and determines whether it runs in windowing mode or program mode. Optionally identifies a device catalog and determines how that catalog is opened.

PROC GDEVICE <CATALOG=<*libref.*>*SAS-catalog*>
<BROWSE>
<NOFS>;

Options

Options used in the PROC GDEVICE statement affect the way you use the procedure.

BROWSE

opens a catalog in browse mode. You cannot modify a catalog when you open it with the BROWSE option. If you are running in program mode when you use BROWSE, you can use only the FS, LIST, QUIT, END, or STOP statements.

CATALOG=<*libref.>SAS-catalog*
CAT=<*libref.>SAS-catalog*
C=<*libref.>SAS-catalog*

specifies the catalog containing device information. If you do not specify a catalog, the procedure opens the first catalog found in the search order of catalogs in browse mode. (See "About the Current Catalog" on page 652.)

To edit the device entries in a catalog, you must use the CATALOG= option.

NOFS

specifies that you are using program mode. In windowing environments, the GDEVICE windows are the default and you must specify NOFS to start GDEVICE in program mode.

ADD Statement

Adds a new device entry to the catalog selected by the CATALOG= option in the PROC GDEVICE statement. The device entry is initialized with NULL values for most parameters.

Requirements: You must have write access to the device catalog in order to add entries, and use CATALOG= in the PROC GDEVICE statement.

Restriction: Not valid in browse mode.

ADD *new-device-entry*
required-parameters
<*optional-parameters*>;

required-parameters are all of the following:

MODULE=*driver-module*
XMAX=*width* <IN | CM>
YMAX=*height* <IN | CM>
XPIXELS=*width-in-pixels*
YPIXELS=*height-in-pixels*

plus one or both of the following parameter pairs:

LCOLS=*landscape-columns*
LROWS=*landscape-rows*

or

PCOLS=*portrait-columns*
PROWS=*portrait-rows*

optional-parameters can be one or more of the following:

ASPECT=*scaling-factor*
AUTOCOPY=Y | N
AUTOFEED=Y | N
CBACK=*background-color*
CELL=Y | N
CHARACTERS=Y | N

CHARREC=(*charrec-list(s)*)

CHARTYPE=*hardware-font-chartype*

CIRCLEARC=Y | N

CMAP=('*from-color* : *to-color*' <...,'*from-color-n* : *to-color-n*'>)

COLORS=(<*colors-list*>)

COLORTYPE=NAME | RGB | HLS | GRAY | CMY | CMYK | HSV | HSB

DASH=Y | N

DASHLINE='*dashed-line-hex-string*'X

DESCRIPTION='*text-string*'

DEVMAP=*device-map-name* | NONE

DEVOPTS='*hardware-capabilities-hex-string*'X

DEVTYPE=*device-type*

DRVINIT1='*system-command(s)*'

DRVINIT2='*system-command(s)*'

DRVQRY | NODRVQRY

DRVTERM1='*system-command(s)*'

DRVTERM2='*system-command(s)*'

ERASE=Y | N

FILECLOSE=DRIVERTERM | GRAPHEND

FILL=Y | N

FILLINC=0...9999

FORMAT=CHARACTER | BINARY

GACCESS=*output-format* | '*output-format* > *destination*'

GCOPIES=*current-copies*

GEND='*string*' <...'*string-n*'>

GEPILOG='*string*' <...'*string-n*'>

GPROLOG='*string*' <...'*string-n*'>

GPROTOCOL=*module-name*

GSFLEN=*record-length*

GSFMODE=APPEND | REPLACE | PORT

SFNAME=*fileref*

GSIZE=*lines*

GSTART='*string*' <...'*string-n*'>

HANDSHAKE=HARDWARE | NONE | SOFTWARE | XONXOFF

HEADER='*command*'

HEADERFILE=*fileref*

ORIGIN=*horizontal-offset* <IN | CM>

HOSTSPEC='*text string*'

HSIZE=*horizontal-size* <IN | CM>

ID='*description*'

INTERACTIVE=USER | GRAPH | PROC

LFACTOR=*line-thickness-factor*

MAXCOLORS=*number-of-colors*

MAXPOLY=*number-of-vertices*

MODEL=*model-number*

NAK='*negative-handshake-response*'X

PAPERFEED=*feed-increment* <IN | CM>

PATH=*angle-increment*

PENSORT=Y | N

PIEFILL=Y | N

POLYGONFILL=Y | N

POSTGRAPH1='*system-command(s)*'

POSTGRAPH2='*system-command(s)*'

PREGRAPH1='*system-command(s)*'

PREGRAPH2='*system-command(s)*'

PROCESS='*command*'

PROCESSINPUT=*fileref*

PROCESSOUTPUT=*fileref*

PROMPT=0...7

PROMPTCHARS='*prompt-chars-hex-string*'X

QMSG | NOQMSG

RECTFILL='*rectangle-fill-hex-string*'X

REPAINT=*redraw-factor*

ROTATE=LANDSCAPE | PORTRAIT

ROTATION=*angle-increment*

SPEED=*pen-speed*

SWAP=Y | N

SYMBOL=Y | N

SYMBOLS='*hardware-symbols-hex-string*'X

TRAILER='*command*'

TRAILERFILE=*fileref*

TRANTAB=*table* | *user-defined-table*

TYPE= CAMERA | CRT | EXPORT | PLOTTER | PRINTER

UCC='*control-characters-hex-string*'X

VORIGIN=*vertical-offset* <IN | CM>

VSIZE=*vertical-size* <IN | CM>

Required Arguments

new-device-entry

specifies the one-level name of the new device entry. *New-device-entry* must be a valid name for a SAS catalog entry for your operating environment and cannot already exist in the current catalog.

required-parameters

all required parameters for the ADD statement correspond to device parameters of the same name. Refer to Chapter 9, “Graphics Options and Device Parameters Dictionary,” on page 301 for a description of each parameter.

Options

All optional parameters for the ADD statement correspond to device parameters of the same name. Refer to Chapter 9, “Graphics Options and Device Parameters Dictionary,” on page 301 for a description of each parameter.

Note: The COLORS= device parameter is not required; the device entry will be created if you do not use it. However, the GDEVICE procedure issues an error message if you do not specify at least one color for COLORS=. △

Details

The ADD statement is rarely used because it initializes parameter values to NULL and you have to set values for all the parameters. The best way to add a new driver is to copy an existing driver and modify it.

COPY Statement

Copies a device entry and places the copy in the current catalog. The original device entry can be either in the current catalog or in a different catalog.

Requirements: You must have write access to the catalog to which the device entry is being copied.

Restriction: Not valid in browse mode.

See also: "Creating or Modifying Device Entries" on page 670

Featured in: Example 1 on page 671

COPY *device-entry where*;

Where *where* must be one or both of the following:

FROM=*<libref.>SAS-catalog*

NEWNAME=*new-device-entry*

Required Arguments

device-entry

specifies the one-level name of the device entry to copy. The entry must exist in either the current catalog (the default) or the catalog specified by FROM=.

FROM=*<libref.>SAS-catalog*

names the catalog from which to copy *device-entry*.

NEWNAME=*new-device-entry*

specifies a name for the copy of the device entry that is placed in the current catalog. *New-device-entry* must be a valid name for a SAS catalog entry and cannot already exist in the current catalog.

If you copy device entries across catalogs and you do not specify a new name, the GDEVICE procedure uses the original name for the new device entry.

DELETE Statement

Deletes the device entry from the current catalog.

Requirements: You must have write access to the current catalog to delete a device entry from it, and use CATALOG= in the PROC GDEVICE statement.

Restriction: Not valid in browse mode.

Caution: A device entry cannot be restored once it has been deleted. Depending on the environment in which you are using the GDEVICE procedure, you may be asked to verify that you really want to delete the entry.

DELETE *device-entry*;

Required Arguments

device-entry

specifies the one-level name of device entry to delete. The entry must exist in the current catalog.

FS Statement

Switches from program mode to the GDEVICE windows.

Requirements: You must be running SAS software in a windowing environment.

FS;

Options

No options.

LIST Statement

Lists all of the parameters of the specified device entry in the Output window.

Default: _ALL_

See also: “Program Mode” on page 654

LIST <*device-entry*>
<_ALL_>
<_NEXT_>

<_PREV_>
<DUMP>;

Options

device-entry
specifies the one-level name of the device entry whose contents you want to list. The entry must exist in the current catalog.

ALL
lists only the name, description, and creation date of all device entries in the current catalog. This is the default. If no entries exist in the catalog, the GDEVICE procedure issues a message.

NEXT
lists the contents of the next device entry. The GDEVICE procedure lists the first entry in the catalog if no entries have been previously listed.

PREV
lists the contents of the previous device entry. If you have not previously listed the contents of a device entry, the GDEVICE procedure issues the following message:

```
No objects preceding current object.
```

DUMP
lists detailed information on *all* device entries in the current catalog. Depending on the number of device entries in the catalog, the DUMP option can create a *large* amount of output.

MODIFY Statement

Changes the values in a device entry.

Requirements: You must have write access to the current catalog to modify a device entry, and use CATALOG= in the PROC GDEVICE statement.

Restriction: Not valid in browse mode.

See also: “Creating or Modifying Device Entries” on page 670

Featured in: Example 1 on page 671

MODIFY *device-entry*
parameter(s);

Required Arguments

device-entry
specifies the one-level name of the device entry that you want to modify. The entry must exist in the current catalog.

parameter(s)
are the parameters you want to modify. These can be any of the parameters listed in the ADD statement, whether listed as required or optional for ADD. See "ADD Statement" on page 657 for a complete list. Refer to Chapter 9, "Graphics Options and Device Parameters Dictionary," on page 301 for a description of each parameter.

Details

To modify a device entry, create your own catalog and then copy the device entries you need into it. You can then change your personal copies of the device entries without affecting the original drivers in SASHELP.DEVICES. (To copy device entries, use the COPY statement, the COPY command available after you choose Import Device Entry from the DIRECTORY window's File menu, or the CATALOG procedure, which is part of base SAS.

CAUTION:
Be careful when modifying device entries in program mode. In program mode, you cannot cancel any modifications you have just made. To change a value you have modified, you must use another MODIFY statement to replace the original value or reset it to its default. (In the GDEVICE windows, you can type the CANCEL command in the command line to cancel changes you have made to the fields.) △

QUIT Statement

Saves all modifications made to device entries during the procedure and exits the GDEVICE procedure.

QUIT | *END* | *STOP*;

Options

No options.

RENAME Statement

Changes the name of the device entry to the name specified in the statement.

Requirements: You must have write access to the current catalog to rename a device entry, and use CATALOG= in the PROC GDEVICE statement.

Restriction: Not valid in browse mode.

RENAME *device-entry*
NEWNAME=*new-entry-name*;

Required Arguments

device-entry
specifies the one-level name of the device entry that you want to rename. The entry must exist in the current catalog.

NEWNAME=*new-entry-name*
specifies the new entry name. *New-entry-name* must be a valid name for a SAS catalog entry and cannot already exist in the current catalog. If the name already exists, the GDEVICE procedure issues an error message.

Using the GDEVICE Procedure

Using the GDEVICE Windows

You can use the GDEVICE windows instead of program mode to view, modify, copy, create, or delete device entries. You perform tasks in the GDEVICE windows by entering values in the fields, by using the pulldown menus, and by issuing commands from the command line.

These are the thirteen GDEVICE windows in order of appearance:

- Directory Window
- Detail Window
- Parameters Window
- Gcolors Window
- Chartype Window
- Colormap Window
- Metagraphics Window
- Gprolog Window
- Gepilog Window
- Gstart Window
- Gend Window
- Host File Options Window
- Host Commands Window

The fields in these windows represent device entry parameters. The GDEVICE windows group the device parameters by topic, to make it easy for you to review or modify the entry. If you open the device entry in edit mode, you can modify the fields directly. For a description of each field, see the corresponding parameter in Chapter 9, “Graphics Options and Device Parameters Dictionary,” on page 301 or refer to the SAS Help facility. For a complete list of device parameters, see “ADD Statement” on page 657.

Note: The parameters are sometimes an abbreviation of the field names, but the correspondence should be clear. For example, in the Detail window, the "Driver query" field corresponds to the DRVQRY parameter, and the "Queued messages" field corresponds to the QMSG parameter. △

This section briefly describes the GDEVICE windows; for a complete description of each window and its fields, refer to the SAS Help facility.

GDEVICE Window Commands

You can navigate and manipulate the GDEVICE windows by entering commands on the command line or selecting them from the menus. For a complete description of all the GDEVICE window commands, refer to the SAS Help facility.

GDEVICE Window Descriptions

DIRECTORY Window

This window appears when you start the GDEVICE procedure in window mode. It lists all the device entries in the default catalog or the catalog you specified in the PROC GDEVICE statement. You can use it to

- copy, rename, or delete device entries in the catalog
- select a device entry whose parameters you want to browse or edit.

You can enter these commands in the Directory window selection field:

B | S
: open the Detail window and browse (B) or, if you are in edit mode, edit (S) the selected device entry.

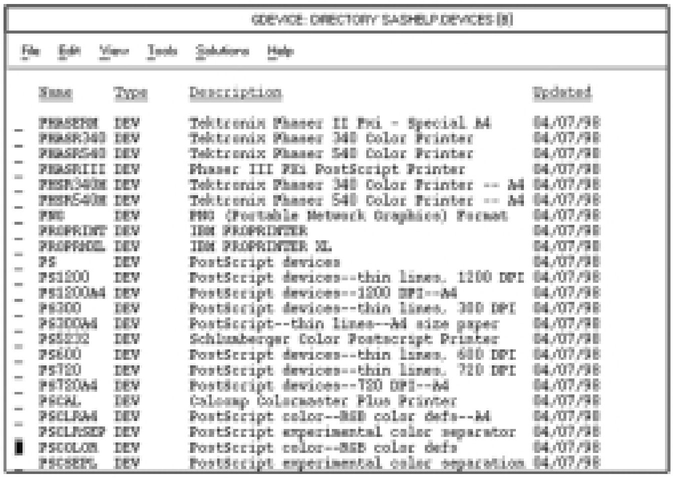
D
: delete the selected device entry. You cannot restore a device entry once it has been deleted.

E
: open the Detail window and edit the selected device entry.

R
: rename the device entry and/or description.

You cannot edit the TYPE and UPDATED fields in the Directory Window.

Figure 15.1 The DIRECTORY Window

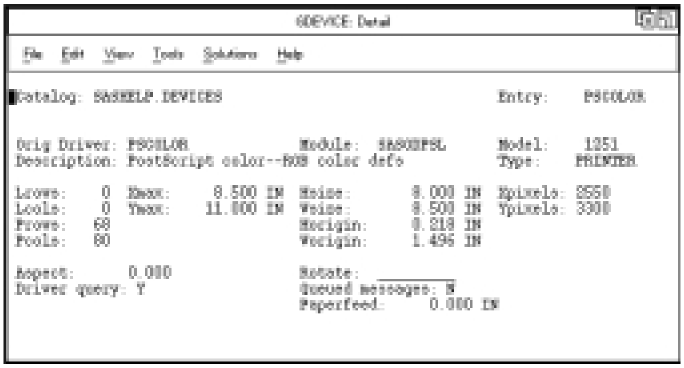


```
  Name     Type     Description                               Updated

_ PHASERM  DEV      Tektronix Phaser II PXi - Special A4      04/07/98
_ PHASR340 DEV      Tektronix Phaser 340 Color Printer        04/07/98
_ PHASR540 DEV      Tektronix Phaser 540 Color Printer        04/07/98
_ PHASRIII DEV      Phaser III PXi PostScript Printer         04/07/98
_ PHSR340A DEV      Tektronix Phaser 340 Color Printer -- A4  04/07/98
_ PHSR540A DEV      Tektronix Phaser 540 Color Printer -- A4  04/07/98
_ PNG      DEV      PNG (Portable Network Graphics) Format    04/07/98
_ PROPRINT DEV      IBM PROPRINTER                            04/07/98
_ PROPRXL  DEV      IBM PROPRINTER XL                         04/07/98
_ PS       DEV      PostScript devices                        04/07/98
_ PS1200   DEV      PostScript devices--thin lines, 1200 DPI  04/07/98
_ PS1200A4 DEV      PostScript devices--1200 DPI--A4          04/07/98
_ PS300    DEV      PostScript devices--thin lines, 300 DPI   04/07/98
_ PS300A4  DEV      PostScript--thin lines--A4 size paper     04/07/98
_ PS5232   DEV      Schlumberger Color Postscript Printer     04/07/98
_ PS600    DEV      PostScript devices--thin lines, 600 DPI   04/07/98
_ PS720    DEV      PostScript devices--thin lines, 720 DPI   04/07/98
_ PS720A4  DEV      PostScript devices--720 DPI--A4           04/07/98
_ PSCAL    DEV      Calcomp Colormaster Plus Printer          04/07/98
_ PSCLRA4  DEV      PostScript color--RGB color defs--A4      04/07/98
_ PSCLRSEP DEV      PostScript experimental color separator   04/07/98
█ PSCOLOR  DEV      PostScript color--RGB color defs          04/07/98
_ PSCSEPL  DEV      PostScript experimental color separation  04/07/98
```

Detail window

This window contains device parameters that control basic characteristics of the device, for example, the size of the graphics output area.

Figure 15.2 The Detail Window



```
Catalog: SASHELP.DEVICES                             Entry:    PSCOLOR

Orig Driver: PSCOLOR            Module:  SASGDPSL     Model:    1251
Description: PostScript color--RGB color defs        Type:    PRINTER

Lrows:    0  Xmax:     8.500 IN  Hsize:       8.000 IN  Xpixels: 2550
Lcols:    0  Ymax:    11.000 IN  Vsize:       8.500 IN  Ypixels: 3300
Prows:   68                      Horigin:     0.218 IN
Pcols:   80                      Vorigin:     1.496 IN

Aspect:      0.000               Rotate:  ________
Driver query: Y                  Queued messages: N
                                 Paperfeed:     0.000 IN
```

From this window you can access any of the subsidiary GDEVICE windows by

□ entering the name of the window on the command line

□ selecting the window from the Tools pulldown

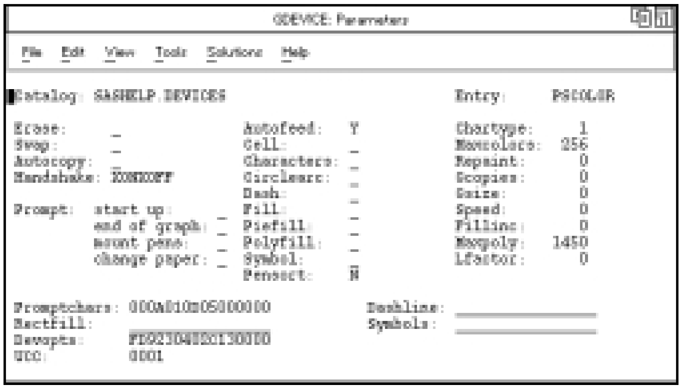
□ opening the subsidiary windows in order of appearance by using the View pulldown and choosing Next Screen, or using the NEXTSCR command on the command line.

Parameters window

This window includes additional device parameters that affect the way graphs are drawn. For example, you choose whether certain graphics primitives are drawn by your hardware or by SAS/GRAPH software, whether to feed paper to printers or plotters automatically, and whether to have SAS/GRAPH software prompt you with messages under certain conditions.

Note: If the device does not support a hardware characteristic, the catalog entry cannot enable the support. △

Figure 15.3 The Parameters Window

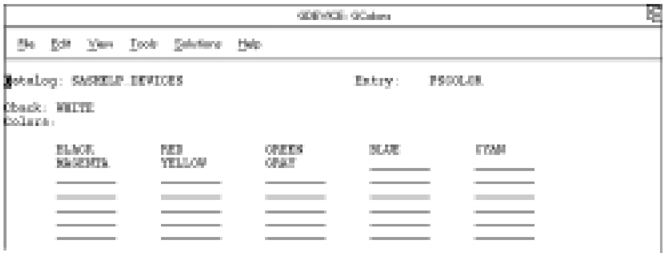


```
Catalog: SASHELP.DEVICES                          Entry:     PSCOLOR

Erase:        _             Autofeed:    Y        Chartype:     1
Swap:         _             Cell:        _        Maxcolors:  256
Autocopy:     _             Characters:  _        Repaint:      0
Handshake: XONXOFF          Circlearc:   _        Gcopies:      0
                            Dash:        _        Gsize:        0
Prompt:  start up:    _     Fill:        _        Speed:        0
         end of graph: _    Piefill:     _        Fillinc:      0
         mount pens:  _     Polyfill:    _        Maxpoly:   1450
         change paper: _    Symbol:      _        Lfactor:      0
                            Pensort:     N

Promptchars: 000A010D05000000           Dashline: ______________
Rectfill:                               Symbols:  ______________
Devopts:     FD92304880130000
UCC:         0001
```

Gcolors window

This window lists the colors that the device driver uses by default. When you do not explicitly specify the color of a graphics feature in your program or in a GOPTIONS statement, SAS/GRAPH software uses this list to determine what color to use.

Figure 15.4 The Gcolors Window (partial view)

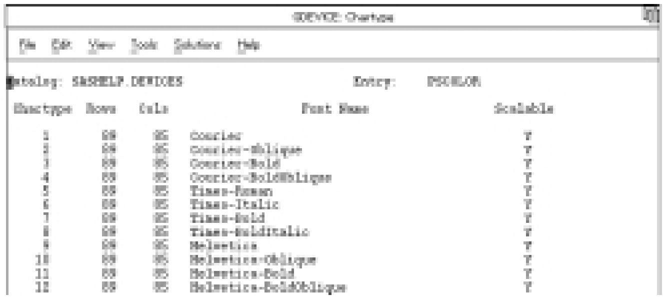


```
Catalog: SASHELP.DEVICES                    Entry:    PSCOLOR

Cback: WHITE
Colors:

      BLACK        RED          GREEN        BLUE         CYAN
      MAGENTA      YELLOW       GRAY
```

Chartype window

This window lists the hardware fonts that the device can use, along with information about the size of the characters. The Chartype value is the value you can use to reference a font in another window. For example, you would enter a Chartype number in the Parameters window's Chartype field.

Figure 15.5 The Chartype Window (partial view)

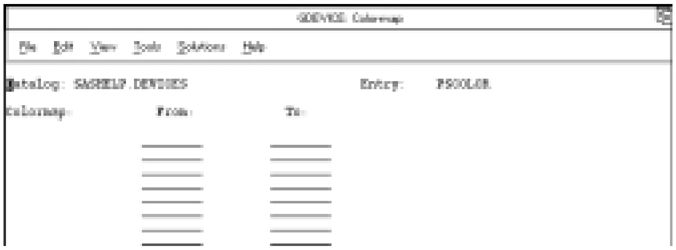


```
Catalog: SASHELP.DEVICES                    Entry:    PSCOLOR

Chartype  Rows   Cols               Font Name                Scalable

    1       69     85   Courier                                  Y
    2       69     85   Courier-Oblique                          Y
    3       69     85   Courier-Bold                             Y
    4       69     85   Courier-BoldOblique                      Y
    5       69     85   Times-Roman                              Y
    6       69     85   Times-Italic                             Y
    7       69     85   Times-Bold                               Y
    8       69     85   Times-BoldItalic                         Y
    9       69     85   Helvetica                                Y
   10       69     85   Helvetica-Oblique                        Y
   11       69     85   Helvetica-Bold                           Y
   12       69     85   Helvetica-BoldOblique                    Y
```

Colormap window

This window allows you to specify a color map for the device. The FROM field specifies the name to assign to the color designated by the *color* value, and the TO field specifies a SAS/GRAPH color name up to eight characters long. Once you have defined the color mapping, you can use the new color name in any color option. For example, if your device entry maps the color name DAFFODIL to the SAS color value PAOY, you can specify COLOR=DAFFODIL on any statement that supports a COLOR= option, and the driver will map this to the color value PAOY.

Figure 15.6 The Colormap Window (partial view)



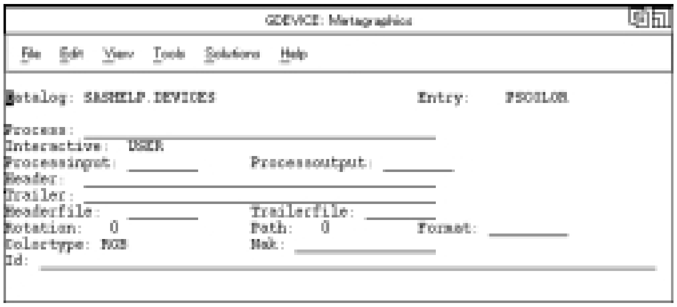
```
Catalog: SASHELP.DEVICES                    Entry:    PSCOLOR

Colormap:          From:            To:
```

Metagraphics window

This window is used by all drivers that support multiple color spaces, for example, RGB or CMYK. It is also used if the device entry is a Metagraphics (user-written) driver. Metagraphics drivers are created when an Institute-supplied device entry cannot be adapted to support your graphics device. For information about Metagraphics drivers, contact Technical Support.

Do not alter the fields in the Metagraphics window unless you are changing the color scheme (colortype), or building a Metagraphics driver.

Figure 15.7 The Metagraphics Window

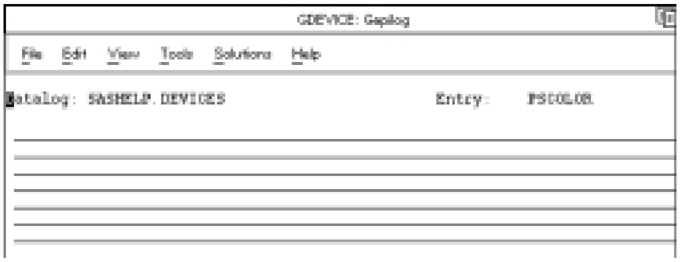


```
Catalog: SASHELP.DEVICES                     Entry:    PSCOLOR

Process: ________________________________________
Interactive:  USER
Processinput: ________      Processoutput: ________
Header: ________________________________________
Trailer: ________________________________________
Headerfile: ________        Trailerfile: ________
Rotation:   0               Path:   0         Format: ________
Colortype: RGB              Hak: ________________
Id: ______________________________________________________________
```

Gprolog window

This window enables you to specify one or more hexadecimal strings that are sent to the device just before graphics commands are sent. Additional commands can be sent with the PREGPROLOG= and POSTGPROLOG= graphics options. See Chapter 9, “Graphics Options and Device Parameters Dictionary,” on page 301 for details.

Figure 15.8 The Gprolog Window (partial view)

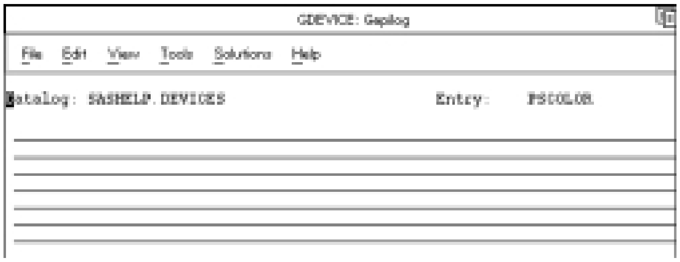


```
Catalog: SASHELP.DEVICES                     Entry:    PSCOLOR
```

Gepilog window

This window enables you to specify one or more hexadecimal strings that are sent to the device just after graphics commands are sent. Additional commands can be sent with the PREGEPILOG= and POSTGEPILOG= graphics options. See Chapter 9, “Graphics Options and Device Parameters Dictionary,” on page 301 for details.

Figure 15.9 The Gepilog Window (partial view)

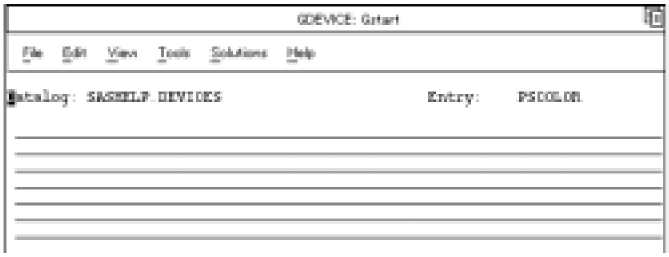


```
Catalog: SASHELP.DEVICES                     Entry:    PSCOLOR
```

Gstart window

This window enables you to specify one or more hexadecimal strings that are placed at the beginning of each record of graphics data.

Figure 15.10 The Gstart Window (partial view)

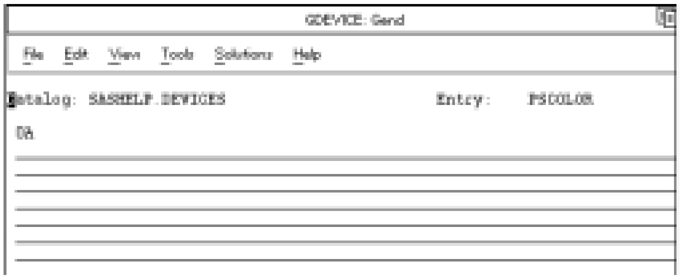


Catalog: SASHELP.DEVICES Entry: PSCOLOR

Gend window

This window enables you to specify one or more hexadecimal strings that are placed at the end of each record of graphics data.

Figure 15.11 The Gend Window (partial view)



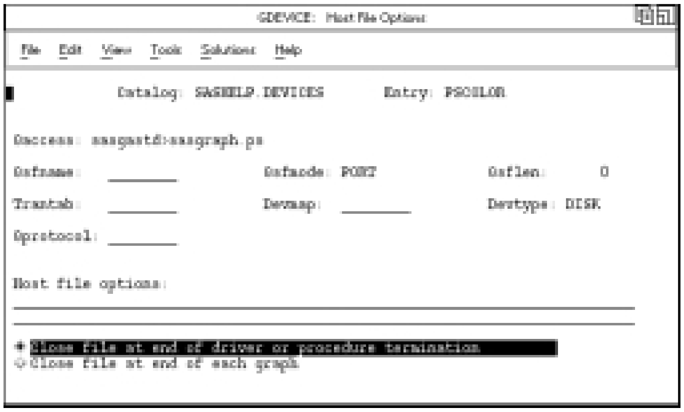
Catalog: SASHELP.DEVICES Entry: PSCOLOR

0A

Host File Options window

This window controls the output destination and formatting of the data stream produced by the driver. (Most of these values can also be specified with the GOPTIONS statement and with the FILENAME statement. See also “Exporting SAS/GRAPH Output with Program Statements” on page 58.)

Figure 15.12 The Host File Options Window



Catalog: SASHELP.DEVICES Entry: PSCOLOR

Gaccess: sasgastd>sasgraph.ps

Gsfname: ________ Gsfmode: PORT Gsflen: 0

Trantab: ________ Devmap: ________ Devtype: DISK

Gprotocol: ________

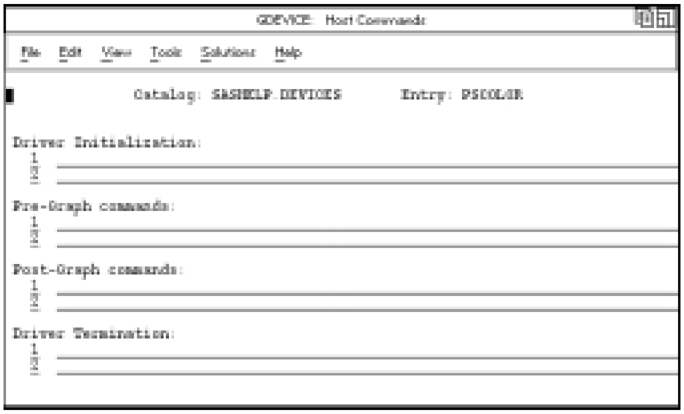
Host file options:

● Close file at end of driver or procedure termination
○ Close file at end of each graph

Host Commands window

This window stores the host commands issued at driver initialization, before and after each graph is produced, and at driver termination. These commands are typically used to send graphics output to a hardcopy device such as a printer or a plotter.

Figure 15.13 The Host Commands Window



```
Catalog: SASHELP.DEVICES      Entry: PSCOLOR

Driver Initialization:
  1
  2
Pre-Graph commands:
  1
  2
Post-Graph commands:
  1
  2
Driver Termination:
  1
  2
```

Creating or Modifying Device Entries

In order to add, modify, or delete device entries, you must have write access to the catalog. On multi-user systems, the SAS support consultant is usually the only person who has write access to the SASHELP.DEVICES catalog and can make any changes. Therefore, when creating new entries or modifying existing ones, individual users usually work in a personal catalog. Be sure the catalog in which you store new or modified device entries is named DEVICES.

To use a device entry stored in a personal catalog, you must assign the GDEVICE*n* libref to the library that contains the device catalog. See “About Device Catalogs” on page 652.

It is a good idea to give a new or modified device entry a name that is different from the original. Then, if you want to use the original device, SAS/GRAPH can find that device when it searches the device catalogs. Remember that SAS/GRAPH searches the GDEVICE*n* libraries *before* it searches SASHELP.DEVICES and uses the first device it finds whose name matches the one you have specified. (See “Search Order of Device Catalogs” on page 653.)

For example, suppose there is a customized copy of PSCOLOR in your GDEVICE0.DEVICES catalog as well as the original in SASHELP.DEVICES. If you specify DEV=PSCOLOR and if the libref GDEVICE0 is assigned, SAS/GRAPH will search GDEVICE0.DEVICES first and use the copy of PSCOLOR stored there. Unless you cancel the GDEVICE0 libref, SAS/GRAPH will never find the original in SASHELP.DEVICES.

Creating a New Device Entry

Typically you create a new device entry by copying an existing device and modifying its parameters to suit your needs. You can copy and modify a device entry in two ways:

- □ Use the DIR command on the command line to open the DIRECTORY window, and then use the COPY command to make a copy of an existing device entry. Then edit the new entry and modify its parameters. The existing device entry can be from any catalog. (See the SAS Help facility for information on using GDEVICE windows and commands.)

□ In program mode, use the COPY statement to make a copy of the device entry and use the MODIFY statement to change the parameters (see Example 1 on page 671).

If you want to start with a blank device entry and fill in values for the parameters, use the EDIT command from the DIRECTORY window or use the ADD statement with program mode PROC GDEVICE.

With either method, you must provide values for the parameters listed in "Required Arguments" on page 659. If you copy and modify an existing entry, all the required parameters will already have values. If you create a new entry with GDEVICE windows, you are prompted to fill in the appropriate fields.

Note: When you change a field in an Institute-supplied device entry (either the original device entry in SASHELP.DEVICES or a copy), SAS/GRAPH software asks whether you really want to change the entry. Answer Y to change the entry or N to cancel the operation. △

Modifying an Existing Device Entry

Typically, you modify an existing device entry when you want to change the device parameters permanently in order to customize a device entry. The process is similar to creating a new entry in that you usually begin by copying the entry you want to modify into your personal catalog and making the changes there. See Example 1 on page 671 for an example of creating a custom device entry.

Changing Device Parameters Temporarily

You can change some device parameters temporarily by overriding their settings with graphics options in a GOPTIONS statement. In this case, the settings remain in effect until you change them or end your SAS session. For details, see "Overriding Device Parameters Temporarily" on page 41.

Examples

The following examples illustrate major features of the GDEVICE procedure.

Example 1: Creating a Custom Device Entry with Program Statements

Procedure features:

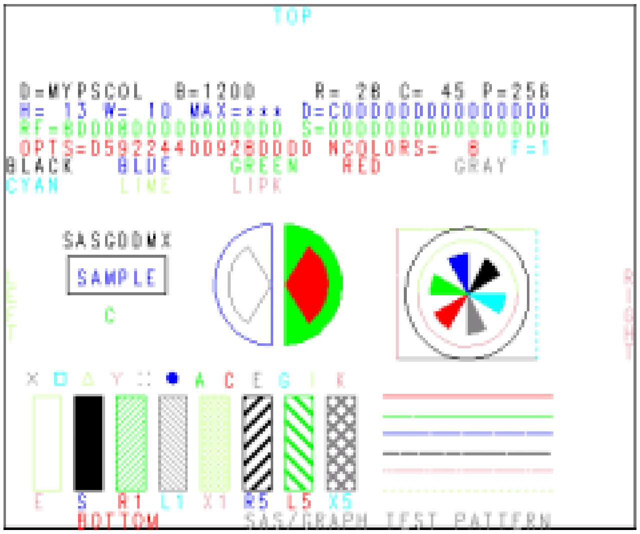
COPY statement

MODIFY statement

Other features:

PROC GTESTIT

Sample library member: GR15N01


TOP
D=MYPSCOL B=1200 R= 28 C= 45 P=256
H= 13 W= 10 MAX=*** D=C000000000000000
RF=B000800000000000 S=0000000000000000
OPTS=D592244DD928DDDD NCOLORS= 8 F=1
BLACK BLUE GREEN RED GRAY
CYAN LIME LIPK
SASGDDMX
SAMPLE
C
LEFT
RIGHT
X A C E G I K
E S R1 L1 X1 R5 L5 X5
BOTTOM
SAS/GRAPH TEST PATTERN

This example shows how to use GDEVICE procedure statements to modify a device entry by copying the original entry into a personal catalog and changing the device parameters. You can submit these statements one at a time or together.

This example permanently changes the default colors list for the PSCOLOR device entry. The contents of the original PSCOLOR entry are shown in Output 15.1 on page 654. The new device entry is illustrated in the PROC GTESTIT output above.

Assign the libref GDEVICE0. The LIBNAME statement assigns the libref to the aggregate file storage location that contains (or will contain) the DEVICES catalog.

```
libname gdevice0 'SAS-data-library';
```

Start the GDEVICE procedure. NOFS causes GDEVICE to use program mode. CATALOG= assigns GDEVICE0.DEVICES as the current catalog. If the DEVICES catalog does not already exist in the library, it is automatically created.

```
proc gdevice nofs catalog=gdevice0.devices;
```

Copy the original device entry from SASHELP.DEVICES to the current catalog. NEWNAME= specifies a name for the copy of PSCOLOR that is placed in GDEVICE0.DEVICES. The name of a catalog entry cannot exceed eight characters.

```
copy pscolor from=sashelp.devices newname=mypscol;
```

Modify the new entry. DESCRIPTION= specifies a new device description that appears in the catalog listing. COLORS= defines a new colors list.

```
   modify mypscol
     description='PSCOLOR with new colors list'
     colors=(black blue green red gray cyan
            lime lipk);
```

Exit the procedure.

```
quit;
```

Test the new device entry. The TARGET= graphics option specifies the new device. Since GDEVICE0 is already defined, SAS/GRAPH looks first in that catalog for the specified device entry. The GTESTIT procedure produces a test picture that show the new colors list and a listing in the LOG.

```
goptions target=mypscol;
proc gtestit pic=1;
run;
```

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