

GRAPHICS/1000-II Device-independent Graphics Library Demo Software Guide



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PRINTING HISTORY

The Printing History below identifies the Edition of this Manual and any Updates that are included. Periodically, Update packages are distributed which contain replacement pages to be merged into the manual, including an updated copy of this Printing History page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past Updates. However, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information. New editions of this manual will contain new information, as well as all Updates.

To determine what manual edition and Update is compatible with your current software revision code, refer to the appropriate Software Numbering Catalog, Software Product Catalog, or Diagnostic Configurator Manual.

Second Edition Jan 1983

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DGL Demo Software

Description of the DGL Demo Software

Upon receiving the DGL software, the user may wish to use the demonstration software which is provided, to verify the integrity of the DGL system. It may also be useful as a starting point for user program development. The demonstration software includes the source code for a set of subroutines which uses DGL to plot axes and grids (both labeled and unlabeled) and a program which demonstrates the use of many DGL calls.

Program GRAPH

GRAPH allows a user to interactively request that a linear graph be drawn. The user has the option of defining different elements of the graph or simply requesting a default graph with default data values. The elements can be defined by interactively specifying the following: data values, labeled or unlabeled axes or grid, and text. The user indicates what function to perform by selecting different buttons. The default graph is drawn by hitting the "Plot graph" button upon running the program.

The FORTRAN source for GRAPH is found in the files &GRAF1 and &GRAF2. The FORTRAN source for the axes and grid subroutine set is found in the files &CHRT1 and &CHRT2. These sources can be compiled by entering the following commands; each command is typed directly after an RTE FMGR (colon) prompt:

```
:FTN4,&GRAF1,1,%GRAF1  
:FTN4,&GRAF2,1,%GRAF2  
:FTN4,&CHRT1,1,%CHRT1  
:FTN4,&CHRT2,1,%CHRT2
```

FTN4X or FTN7X can be used instead.

This program uses the button, keyboard, and locator input devices, and the alphanumeric and graphics displays. The program could be configured for the HP 2647A or HP 2648A graphics terminal and loaded with the command sequence:

```

*****Relocate the demo program:
  RE,%GRAF1
  RE,%GRAF2
*****Relocate the axes and grid calls:
  RE,%CHRT1
  RE,%CHRT2
*****Search the HP 2648A alphanumeric handler file:
  SE,$A0001
*****Search the HP 2648A button handler file:
  SE,$B0001
*****Search the HP 2648A locator handler file:
  SE,$L0001
*****Search the HP 2648A keyboard handler file:
  SE,$K0001
*****Search the HP 2648A display handler file:
  SE,$D0001
*****Search the DGL library:
  SE,$DIDD
*****Implicitly search the system library:
  END

```

NOTE: The ENCOD routine, found in &CHRT2, which encodes labels into ASCII strings, uses the subroutines SMOVE and SFILL. SMOVE and SFILL are in the Decimal String Arithmetic library (%DECAR). Users must search the library if it has not been generated into their system.

Once loaded, GRAPH can be run by typing after a colon prompt:

```
:RU,GRAPH
```

GRAPH is coded to perform all I/O on LU 1; but the user can change the LU before compilation.

AXES, LAXES, GRID and LGRID Software

&CHRT1 and &CHRT2 contain source code for the following entry points, which can be called from any DGL program to demonstrate the drawing of rectangular plots:

```

AXES   - Draw axes
GRID   - Draw axes with grid
LAXES  - Draw axes with labels
LGRID  - Draw axes with grid and labels

```

Subroutines AXES, GRID, LAXES, and LGRID have the same parameter lists. They assume that the DGL system is correctly initialized. DGL attributes and viewing transformations such as linestyle, character sizes, windows, and viewports may be changed by these calls but they are restored to their former values at the completion of these calls.

The following functions are performed by AXES, GRID, LAXES, and LGRID:

1. Draw X and Y axes with boundaries the same as the user defined window. The origin of both axes is specified in the call. Linestyle 1 is used for the axes.
2. Draw the tic marks on the axes. The tic marks are linearly spaced about the origin so that a major tic mark falls on the origin. Major tic marks or a combination of major and minor tic marks are drawn.

In addition, the GRID and LGRID routines do the following:



1. Draw grid lines at the major tic marks in linestyle 1.
2. If tic size is set to 0.0, draw grid lines at the minor tic marks in linestyle 2.

All lines, i.e. axes, tic marks and grid lines, are clipped to the window.

LAXES and LGRID label the major tic marks. Labels are placed outside of the user defined window so that they are outside the graphics area. The axes labels are drawn using hardware text. It is the user's responsibility to set an appropriate character size based on the magnitude of the window so that characters are readable and labels do not overlap. Also, the user must leave enough room on the logical display surface outside the current viewport to allow room for the labels (i.e. the viewport cannot fill the entire view surface). This room must be left because the labels are placed outside the user defined viewport to which the window is mapped. If there is no room outside the user defined viewport on a side, labels are drawn inside the graph area on that side. Labels are limited to 8 characters, including the decimal point and minus sign.

The calling sequence is the same for all the calls:

```
] CALL AXES (XTIC,YTIC,XORG,YORG,XMJC,YMJC,TSIZE)
] CALL LAXES (XTIC,YTIC,XORG,YORG,XMJC,YMJC,TSIZE)
] CALL GRID (XTIC,YTIC,XORG,YORG,XMJC,YMJC,TSIZE)
] CALL LGRID (XTIC,YTIC,XORG,YORG,XMJC,YMJC,TSIZE)
```

The parameters used by AXES, GRID, LAXES, and LGRID are the following:

XTIC [REAL; INPUT]

XTIC, defined in world coordinates, specifies units between tic marks on the X axis. If XTIC = 0.0, then no tics will be drawn.

YTIC [REAL; INPUT]

YTIC, defined in world coordinates, specifies units between tic marks on the Y axis. If YTIC = 0.0, then no tics will be drawn.

XORG [REAL; INPUT]

XORG, defined in world coordinates, gives the X coordinate for the origin of the axes. The Y axis will be drawn through this X coordinate, assuming that it is within the window. If this coordinate is not within the window, the Y axis will not be drawn. However, labels will appear if calling LAXES or LGRID.

YORG [REAL; INPUT]

YORG, defined in world coordinates, gives the Y coordinate for the origin of the axes. The X axis will be drawn through this Y coordinate, assuming that it is within the window. If this coordinate is not within the window, the X axis will not be drawn. However, labels will appear if calling LAXES or LGRID.

XMJC [REAL; INPUT]

XMJC, defined in world coordinates, gives the number of tic spacing intervals between major tic marks on the X axis. This should have an integral value, even though it is type real in the parameter list. If XMJC = 1.0, then all X tics are major.

YMJC [REAL; INPUT]

YMJC, defined in world coordinates, gives the number of tic spacing intervals between major tic marks on the Y axis. This should have an integral value, even though it is type real in the parameter list. If YMJC = 1.0, then all Y tics are major.

TSIZE [REAL; INPUT]

TSIZE, defined in virtual coordinates, gives the length for minor tic marks. Major tics are of length twice TSIZE. If TSIZE = 0.0 in the call to GRID or LGRID, then linestyle 2 is used to draw minor grid lines. Note that since the lengths of the major and minor tic marks are specified in virtual coordinates, the physical length of a tic mark on either side of the X-axis, as drawn on the final plot, is the same as the physical length of a corresponding tic mark on either side of the Y-axis.

NOTE: The ENCOD routine, found in &CHRT2, which encodes labels into ASCII strings, uses the subroutines SMOVE and SFILL. SMOVE and SFILL are in the Decimal String Arithmetic library (%DECAR). Users must search the library if it has not been generated into their system.

Differences Between GPS and DGL Rectilinear Plot Routines

For users familiar with Graphics/1000 GPS (Graphics Plotting Software), the AXES, GRID, LAXES, and LGRID calls in the DGL demo software are equivalent to the rectilinear plot calls found in GPS, with the following exceptions:

1. In the demo software, major tics, major grids, and minor tics are drawn in linestyle 1; minor grid lines, if specified, are drawn in linestyle 2. GPS uses linestyles 0 and 1, respectively.
2. For a label, the demo software allows a maximum of 8 characters, including the decimal point and minus sign. GPS only allows only 7, but allows variable specification of control using FXD. DGL does not have an equivalent to the FXD function, nor does it allow scientific notation for labels; so the numerical label limits range from -.000001 to +99999.9.
3. In the demo software, TSIZE must be defined in virtual coordinates in order for the length to appear the same on the X and Y axes (see description of TSIZE parameter for more details). GPS uses normalized device coordinates which are functionally equivalent to virtual coordinates.
4. Because DGL does not have an equivalent of the GPS CLIP call, the user must allow enough room on the logical display surface for the labels. In other words, the user cannot use the default viewport of (0.,1., 0.,1.) but must call ZVIEW to shrink the viewport. If labels are requested the rectilinear plot calls expand the window and viewport based on the current character size to make room for the labels. If a side cannot be expanded the desired amount, it is left as is and labels are drawn inside the graph area on that side. The window and viewport are restored to their original values at the end of the calls. The window and viewport are expanded based on the following criteria:
 - a) On the left side of the window, enough room is left to allow 8 characters as well as an extra character space width to leave room between the graph and labels.
 - b) On the right side, if there is a major tic/grid at the end of the X axis, at most half a label will extend past the window, so enough room is left for 4 characters.

- c) On the bottom, enough room is left for the height of the characters plus an extra space to allow for space between the labels and the graph.
 - d) On the top, enough room is left for half a character cell height since this is the most that a label will extend over the top of the window. This occurs when a major tic/grid lies at the top of the Y axis.
5. With LAXES and LGRID, labels are always parallel to the X-axis. In GPS, labels can be drawn parallel to either axis.
6. In the demo software, no default values are available for any of the parameters, whereas GPS provides defaults. However, with FTN4X or FTN7X the demonstration software can easily be modified to include defaults.

Files on the Demo Tape

The distribution medium contains six files. The first file is a directory file. The second file is the transfer file for removing the DGL demos from the distribution medium. The next four files are sources for the demos written using DGL.

*DIR

*DEMOS

&GRAF1 - Part No. 24998-18466

&GRAF2 - Part No. 24998-18467

&CHRT1 - Part No. 24998-18468

&CHRT2 - Part No. 24998-18469

Instructions for Bringing the Software off the Medium

The following are instructions for bringing the DGL demo software off of the distribution medium.

1. Make sure that Merge is loaded and available to FMGR. This is necessary because there are several files that must be MERGED together.
2. Insert or mount the appropriate medium:

minifloppy	24998-13411
floppy disc	24998-13404
800 BPI mag tape	24998-13504
1600 BPI mag tape	24998-13506
minicartridge	24998-13308

Determine the correct LU (or CRN for floppies). This is the <source LU> in the following instructions.

3. *For mag tapes and minicartridges only:* Advance past the first file, then pull the next file off of the tape. This can be done from FMGR by typing after a colon prompt: (User text in italics)

:CN,<source LU>,FF

:ST,<source LU>,<file name>,AS

where <file name> is *MTRN for mag tapes or *CTRN for minicartridges. This file is a transfer file that will pull everything else from the tape(s).

For minifloppies only: Copy the appropriate transfer file from the minifloppy to the destination CRN. This can be done from FMGR by typing after a colon prompt:

ST,<file name>::<source LU>,<file name>::<destination CRN>,AS

where <file name> is *MFTRN

4. *For All Media Except Cartridge Tape:*

Transfer to <namr> where <namr> is:

*MTRN	for mag tapes (24998-18475)
*CTRN	for minicartridges (24998-18465)
*FTRN	for floppy discs (24998-18474)
*MFTRN	for minifloppy discs (24998-18479)

The transfer file will take four arguments:

- 1st arg: <source LU> as defined above in step 2;
- 2nd arg: <destination CRN> where the files are to go;
- 3rd arg: <security code> that the files will be given;
- 4th arg: if set to PURGE it will purge existing files,
if set to NOPURGE it will not purge existing files.

If the first argument is not provided, it will default to LU 8 for mag tapes and LU 4 for minicartridges. This argument must be provided for floppy discs. The second argument defaults to the first available cartridge. If the third argument is not specified, then the files will be created without a security code.

One can transfer to the file from FMGR by typing after a colon prompt:

```
TR,<namr>,<source LU>,<destination CRN>,<security code>,PURGE
```

or

```
TR,<namr>,<source LU>,<destination CRN>,<security code>,NOPURGE
```

NOTE: To transfer minifloppies to the copy of *MFLP, use the minifloppy on <destination CRN>, not the one on <source LU>.

5. *For cartridge tapes only:* Follow the instructions for reading DGL software from the cartridge tape.

For minicartridges only: Before attempting to read from a new minicartridge, the transfer file prints which cartridge it expects, then pauses. This is to give the user a chance to insert the correct cartridge into the drive. After inserting the cartridge, the user can restart the transfer file by typing a colon : followed by <return>. The transfer file then starts reading the files from that minicartridge.

For minifloppies only: Before attempting to read from a new minifloppy, the transfer file dismounts the minifloppy cartridge, prints which minifloppy to insert next, and pauses. This is to give the user a chance to insert the correct minifloppy into the drive. After inserting the minifloppy, the user can restart the transfer file by typing a colon : followed by <return>. The transfer file then remounts the cartridge and starts reading the files off of that minifloppy.

6. All the DGL graphics demos are now on your system and ready to use.

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Arranged alphabetically by country



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BERCA Indonesia P.T.
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Antara Bldg., 17th Floor
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OMAN

Khimjil Ramdas
P.O. Box 19
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Tel: 722225, 745601
Telex: 3289 BROKER MB MUSCAT
P
Suhail & Saud Bahwan
P.O.Box 169
MUSCAT
Tel: 734 201-3
Telex: 3274 BAHWAN MB

PAKISTAN

Mushko & Company Ltd.
1-B, Street 43
Sector F-8/1
ISLAMABAD
Tel: 51071
Cable: FEMUS Rawalpindi
A,E,M
Mushko & Company Ltd.
Oosman Chambers
Abdullah Haroon Road
KARACHI 0302
Tel: 524131, 524132
Telex: 2894 MUSKO PK
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PANAMA 5
Tel: 63-6613, 63-6748
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PERU

Cia Electro Médica S.A.
Los Flamencos 145, San Isidro
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Tel: 41-4325, 41-3703
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The Online Advanced Systems
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Electronic Specialists and Proponents
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Cubao, QUEZON CITY
P.O. Box 2649 Manila
Tel: 98-96-81, 98-96-82, 98-96-83
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P

PORTUGAL

Mundinter
Intercambio Mundial de Comércio
S.A.R.L.
P.O. Box 2761
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P-LISBON
Tel: (19) 53-21-31, 53-21-37
Telex: 16691 munter p
M
Soquimica
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Hewlett-Packard Puerto Rico
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P
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DOHA
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