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PILOT CLIMATE DATA SYSTEM: USER'S GUIDE FOR CHARTS SUBSYSTEM

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ABSTRACT

This document provides information and instruction on the use of the Pilot Climate Data System's (PCDS) CHARTS Subsystem. This facility is an interactive software system for the graphical production and enhancement of text and viewgraph displays.

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1. Introduction

The CHARTS utility provides the user a method to enhance the traditional printed output of text and viewgraph material. Two options are available for chart output: TEXT and VIEWgraph displays. The TEXT option provides an improvement over typical line-printer output in that a variety of fonts may be used. The VIEW option provides an easy method to produce standard viewgraph output in varying colors and optionally annotated with bullets.

Access to this utility is through the Pilot Climate Data System (PCDS). This system provides scientific researchers with an easy method to identify and access weather, climate, atmospheres, and oceans data sets. The PCDS is composed of five subsystems: CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. The CHARTS utility is available through the GRAPHICS subsystem. This User's Guide assumes a knowledge of the PCDS and its user interface; however, further information and instruction is available in Appendix A of this document and through the PCDS User's Guide.

To utilize the features of the CHARTS facility, the user must have first created a file containing the desired display information with one of the VAX standard editors. Next, the user activates the PCDS on the VAX (see Appendix A), selects the CHARTS facility, and enters values for the various options which control the display of the input file.

2. CHARTS Menu

The CHARTS system allows the user to produce text and viewgraph output of a user-created input file. This menu consists of two items, as illustrated in Figure 2-1. Text pages will automatically be sent to the high resolution black and white output device (the VERSATEC printer/plotter); however, the user may display the viewgraph pages on a graphics terminal or he may archive these pages to a file for output via the PCDS GRAPHICS Subsystem Post-Processor. The Post-Processor allows the combination of plots on one page and the specification of the medium and size of output. See Section 2.2.3 for more details on the use of this procedure.

2.1 TEXT Procedure

The TEXT procedure allows the user to output a single or multi-paged input file to the VERSATEC printer/plotter. Thus, the user may improve over the standard line-printer output by taking advantage of a variety of fonts to enhance the textual display. This section discusses the required format of the input file and the various options available to enhance the printed copy.

2.1.1 Input File Characteristics

The initial tutor display for the text input file is shown in Figure 2-2. The input file may contain several pages of textual information; all pages must be separated by a form feed character (ASCII character

```
Menu:   "CHARTS", library "PCDS$LIB"

                        Text and Viewgraph Output

 1)     Text Charts                                        ( TEXT )

 2)     Viewgraph Charts                                   ( VIEW )



Enter:  selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
?
```

Figure 2-1. CHARTS Menu

```
Tutor: proc "TEXT", library "PCDS$LIB"                          Pg 1.

                        Text Output Charts

   parm          description                          value

FILENAME  Name of Input File                    "TEXT.DAT"



Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

Figure 2-2. TEXT Tutor Display

12). Each page of the text input file must be no more than 60 lines in length. In addition, the text lines should be less than 80 characters in width. These lines of text may contain any non-reserved printable character (including blank spaces). Reserved characters include:

\ ("back slash")
~ (tilde)
^ (carat)
@ ("at" sign)
` (accent)
_ (underscore)

Similarly, special characters, such as the tab or line feed, should not be used within the text file. Any blank lines of text included in this input file will be displayed on output to the VERSATEC printer/plotter. In addition, the spacing as it appears in the input file is preserved upon output, e.g., indentation, etc. A sample one-page text input file is given in Figure 2-3. It should be noted that the first line is part of a title and will be centered upon output.

2.1.2 Output Specifications

Figure 2-4 shows the tutor display of text output options and their associated default values. By selecting various options from the tutored parameters described below, the user may enhance the output of the created input file. All selected options will affect each page included in this text file. Figure 2-5 illustrates the results of the TEXT program for the input file shown in Figure 2-3. Here, an UNderLINed title of ONE line, a MEDIUM border, SINGLE spacing, and the CROM font were specified.

Following the selection of the desired options and the completion of the TEXT program, the output will be directed to the black and white printer/plotter for retrieval at a later time. In other words, the user will not view the results of the TEXT program on the terminal screen; this procedure produces hardcopy results only.

Depending upon the size of the input file (i.e., the number of pages and the number of lines per page), the user may need a large amount of free space in his VAX account. In addition to the size of the input file, the selected font style affects the size required for the generation of the text output. For example, the one-paged, fifty-four-lined text output shown in Figure 2-5 required 2435 VAX blocks when the TROM (Triplex Roman) font was specified. However, using the simplest font, STPL (Simple Characters), required 480 VAX blocks to generate the output, while using the most complex font, GENG (Gothic English), required 2260 VAX blocks to produce the output. Following completion of the printing, these large files will be deleted from the user's VAX account. The complete set of the text outputs (and their respective size requirements) generated from the input file shown in Figure 2-3 using the ten available fonts can be found in Appendix D.

SYSTEM OVERVIEW

The PCDS consists of five subsystems: CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. A brief description of each of the five subsystems of the PCDS is provided below.

The CATALOG Subsystem provides a user with comprehensive descriptions of a number of climate parameter data sets and the associated sensor measurements from which the climate parameters were derived. These descriptions include the temporal and spatial extents of the data sets together with the experiments' data products. The catalog information is maintained at two levels: summary and detailed. Summary information is stored in a data base managed by a commercial data base management system, ORACLE. The user may obtain a list of summary information about the data sets by specifying keywords to limit the information listed. Detailed descriptive information is maintained in text files which the user may browse as one would a book, using tables of contents to locate information of interest. The information is displayed at the user's terminal in a paged format.

The INVENTORY Subsystem provides detailed information about the temporal coverage and data volume of data sets which are readily accessible through either the PCDS or other applications stored in the ORACLE data base. The inventory performs two important functions. First, it allows a user to scan the total data holdings and determine whether data for a given time period are accessible. Second, it enables the DATA ACCESS Subsystem (described below) to automatically locate data meeting such user specifications as time range and parameters.

The DATA ACCESS Subsystem allows the user to access automatically the PCDS data sets using criteria such as time range and geographic location. Output from this subsystem includes user disk files or tape files in the same format as the original data, or files in a special data-independent format which allows them to be input to other subsystems of the PCDS. These special files are called Climate Data Files (CDFs). Users may also obtain listings of the data. The data sets generated by the copy operation can be subsequently listed, copied or subsetted.

The DATA MANIPULATION Subsystem allows the user to access and manipulate the data-independent files created via DATA ACCESS or by application programs written by users, possibly on another machine. Therefore, this subsystem is not limited only to data sets the PCDS directly supports. This subsystem includes programs which allow users to obtain a listing of a CDF's contents, subset a CDF, or split a gridded data set apart into its components (latitude, longitude, value). The output of any of these may be input to any other DATA MANIPULATION program or the programs in the GRAPHICS Subsystem.

The GRAPHICS Subsystem provides the user with the tools to create various graphical representations of the data stored in CDFs. Users may generate such graphical displays as histograms, "x-y" plots, contour plots, and surface diagrams. Many options exist to tailor the output for a specific need. Various color and monochromatic display devices (e.g., terminals and plotters) are supported. Publication/presentation quality output is also available.

Figure 2-3. Sample TEXT Input File

```
Tutor: proc "TEXTOPT", library "PCDS$LIB"                          Pg 1.

                          Text Output Charts

 parm        description                              value

 LINES       Number of Lines in the Title                 0
 UNLINE      Underline the Title Line(s)              "NO"
 BORDER      Border on Text Output                    "NONE"
 SPACE       Spacing of Lines                         "SINGLE"
 FONT        Font Style                               "STPL"


Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

Figure 2-4. TEXTOPT Tutor Display

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The INVENTORY Subsystem provides detailed information about the temporal coverage and data volume of data sets which are readily accessible through either the PCDS or other applications stored in the ORACLE data base. The inventory performs two important functions. First, it allows a user to scan the total data holdings and determine whether data for a given time period are accessible. Second, it enables the DATA ACCESS Subsystem (described below) to automatically locate data meeting such user specifications as time range and parameters.

The DATA ACCESS Subsystem allows the user to access automatically the PCDS data sets using criteria such as time range and geographic location. Output from this subsystem includes user disk files or tape files in the same format as the original data, or files in a special data-independent format which allows them to be input to other subsystems of the PCDS. These special files are called Climate Data Files (CDFs). Users may also obtain listings of the data. The data sets generated by the copy operation can be subsequently listed, copied or subsetted.

The DATA MANIPULATION Subsystem allows the user to access and manipulate the data-independent files created via DATA ACCESS or by application programs written by users, possibly on another machine. Therefore, this subsystem is not limited only to data sets the PCDS directly supports. This subsystem includes programs which allow users to obtain a listing of a CDF's contents, subset a CDF, or split a gridded data set apart into its components (latitude, longitude, value). The output of any of these may be input to any other DATA MANIPULATION program or the programs in the GRAPHICS Subsystem.

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Figure 2-5. Sample TEXT Output

2.1.2.1 Title

Title lines may be included in the file. The user must enter the number of lines (0 indicating no title) included in the input file to be considered a title. If multiple pages are present in this file, the number of title lines applies to all pages. Blank lines may be included in the title. Upon output, the title line(s) will be enlarged and centered at the top of the page; therefore, these lines should be left-justified in the input file (see Figure 2-3).

2.1.2.2 Underline

If a title has been indicated, the user may request the line(s) to be underlined. However, if no title has been specified, this parameter is ignored. Neither blank lines nor blank spaces included in the title will be underlined.

2.1.2.3 Border

Each page of output may be enclosed within a border of a selected width. The user may select the type of border from the following:

NONE	No border
NARROW	One line-width
MEDIUM	Three line-widths
WIDE	Five line-widths

Illustrations of these border widths are given in Figure 2-6.

2.1.2.4 Spacing

The user may select the spacing of text output lines; naturally, the type of spacing will affect the number of lines which will fit on a page of output. Therefore, an excess of lines because of the spacing selection may cause the upper and lower lines of the page to be "clipped" from the resulting output (each text page is centered vertically on output). In other words, a full page is not continued on a second display; it is centered, thus removing the top and bottom portions of the page. The following options (and resulting page sizes) are available:

SINGLE	Allows 64 lines per page (not including title lines)
HALF	One-half line-width inserted between each line; allows 42 lines per page (not including title lines)
DOUBLE	One full line-width inserted between each line; allows 32 lines per page (not including title lines)

Samples of these spacing options are given in Figure 2-7. This figure illustrates the clipping which occurs at the upper portion of a text page because of the space selection.

written by users, possibly on
not limited only to data sets
includes programs which allow
subset a CDF, or split a grid
longitude, value). The outpu
MANIPULATION program or the p

The GRAPHICS Subsystem p
graphical representations of
graphical displays as histogr
diagrams. Many options exist
Various color and monochromat
are supported. Publication/p

No Border

written by users, possibly on
not limited only to data sets
includes programs which allow
subset a CDF, or split a grid
longitude, value). The outpu
MANIPULATION program or the p

The GRAPHICS Subsystem p
graphical representations of
graphical displays as histogr
diagrams. Many options exist
Various color and monochromat
are supported. Publication/p

NARROW Border

written by users, possibly on
not limited only to data sets
includes programs which allow
subset a CDF, or split a grid
longitude, value). The outpu
MANIPULATION program or the p

The GRAPHICS Subsystem p
graphical representations of
graphical displays as histogr
diagrams. Many options exist
Various color and monochromat
are supported. Publication/p

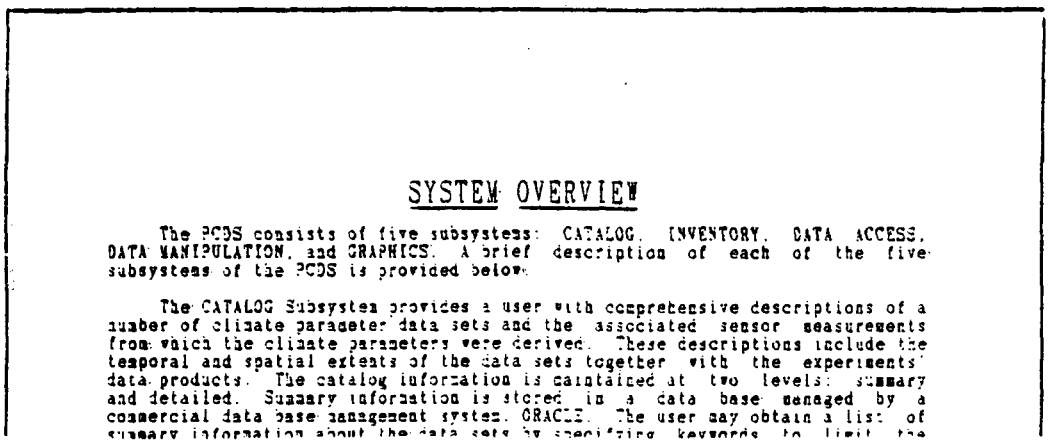
MEDIUM Border

written by users, possibly on
not limited only to data sets
includes programs which allow
subset a CDF, or split a grid
longitude, value). The outpu
MANIPULATION program or the p

The GRAPHICS Subsystem p
graphical representations of
graphical displays as histogr
diagrams. Many options exist
Various color and monochromat
are supported. Publication/p

WIDE Border

Figure 2-6. TEXT Border Options

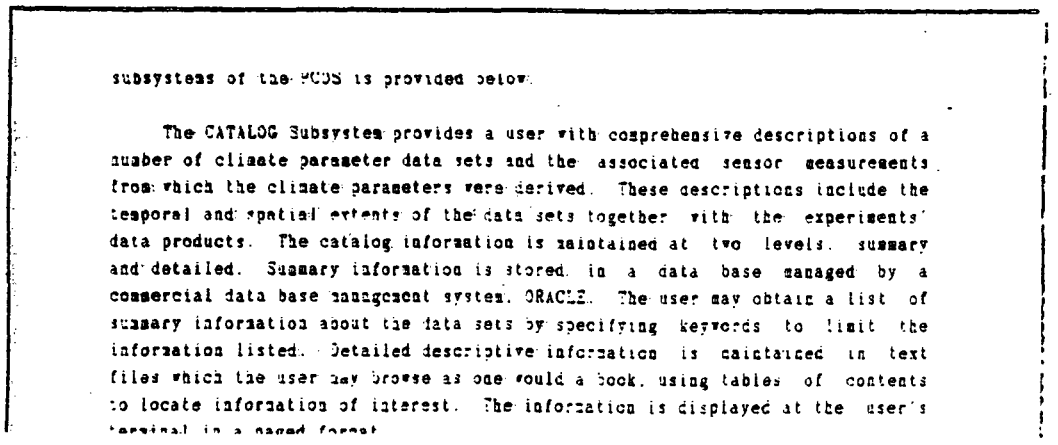


SYSTEM OVERVIEW

The PCDS consists of five subsystems: CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. A brief description of each of the five subsystems of the PCDS is provided below.

The CATALOG Subsystem provides a user with comprehensive descriptions of a number of climate parameter data sets and the associated sensor measurements from which the climate parameters were derived. These descriptions include the temporal and spatial extents of the data sets together with the experiments' data products. The catalog information is maintained at two levels: summary and detailed. Summary information is stored in a data base managed by a commercial data base management system, ORACLE. The user may obtain a list of

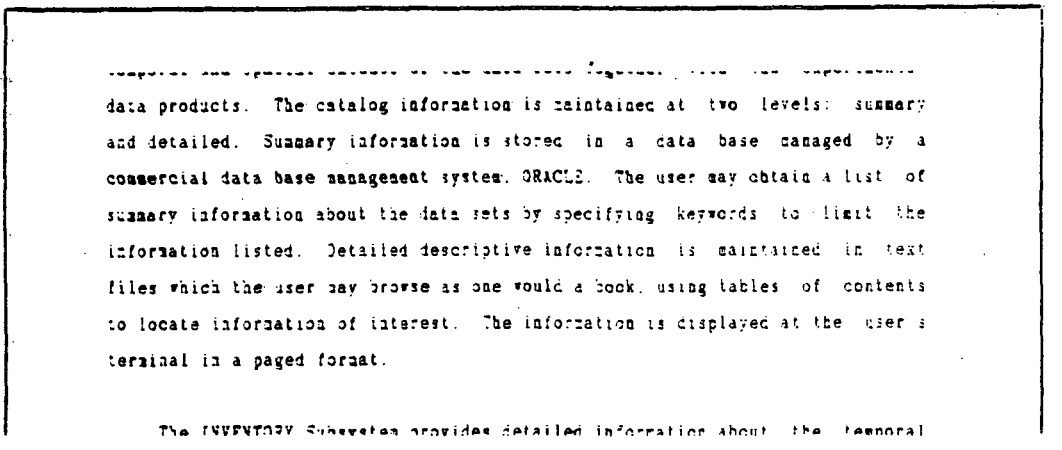
SINGLE Spacing



subsystems of the PCDS is provided below.

The CATALOG Subsystem provides a user with comprehensive descriptions of a number of climate parameter data sets and the associated sensor measurements from which the climate parameters were derived. These descriptions include the temporal and spatial extents of the data sets together with the experiments' data products. The catalog information is maintained at two levels: summary and detailed. Summary information is stored in a data base managed by a commercial data base management system, ORACLE. The user may obtain a list of summary information about the data sets by specifying keywords to limit the information listed. Detailed descriptive information is maintained in text files which the user may browse as one would a book, using tables of contents to locate information of interest. The information is displayed at the user's terminal in a paged format.

HALF Spacing



data products. The catalog information is maintained at two levels: summary and detailed. Summary information is stored in a data base managed by a commercial data base management system, ORACLE. The user may obtain a list of summary information about the data sets by specifying keywords to limit the information listed. Detailed descriptive information is maintained in text files which the user may browse as one would a book, using tables of contents to locate information of interest. The information is displayed at the user's terminal in a paged format.

The INVENTORY Subsystem provides detailed information about the temporal

DOUBLE Spacing

Figure 2-7. TEXT Spacing Options

2.1.2.5 Font Style

The user may specify one of several font styles. The title line(s) and the body of all pages of text output will be drawn in the specified font. The following fonts are available:

STPL	Simple characters
SROM	Simplex Roman font
DROM	Duplex Roman font
CROM	Complex Roman font
TROM	Triplex Roman font
CITA	Complex Italic font
TITA	Triplex Italic font
SSCR	Simplex Script font
CSCR	Complex Script font
GENG	Gothic English font

Figure 2-8 illustrates these font styles. The complete character set for each font can be found in Appendix C.

2.2 VIEW Procedure

The VIEW procedure allows the user to output a single or multi-paged input file in viewgraph format. The initial tutor display for the VIEW proc is given in Figure 2-9. Here, the user must enter the input file name and desired output device, i.e., the output may be directed to the viewing terminal and/or to a plot file for later display by the PCDS GRAPHICS Subsystem Post-Processor (see Section 2.2.3). If the viewgraphs are to be displayed on the terminal, the procedure will pause following the graph of each page contained in the input file. In order to view subsequent pages, the user should enter a carriage return. This section discusses the required format of the input file and the various options available to enhance the display of the viewgraph pages.

2.2.1 Input File Characteristics

The input file may contain several pages of information; all page must be separated by a form feed character (ASCII character 12). Each page must be no more than 40 lines (including blank lines) in length; the viewgraph lines should be less than 80 characters in width. However, on output all lines will be wrapped (at word breaks) after 50 characters in width. The lines of the viewgraph may contain any non-reserved printable character (including blank spaces). Reserved characters include:

\ ("back slash")
~ (tilde)
^ (carat)
@ ("at" sign)
` (accent)
_ (underscore)

Similarly, special characters, such as the tab or line feed, should not be used within the viewgraph file. Any blank lines included in this input file will be displayed on output. A sample two-page input file is given in Figure 2-10. The first three lines of each page are part of a title and will be centered upon output.

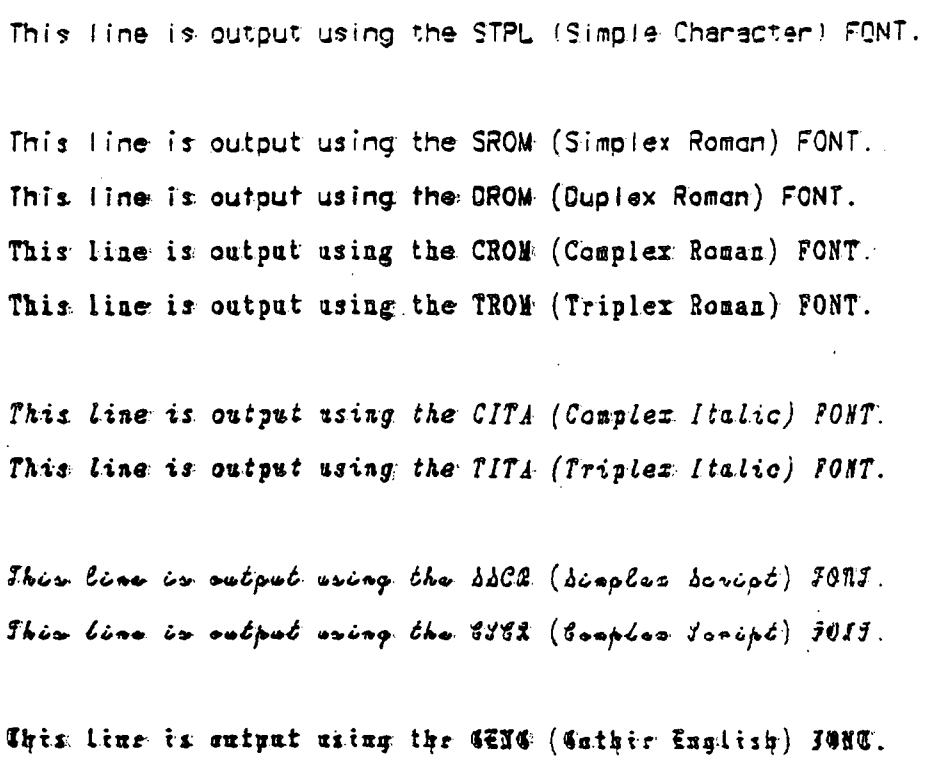


Figure 2-8. Font Styles

```
Tutor: proc "VIEW", library "PCDS$LIB"                          Pg 1.

                        Viewgraph Output Charts

  parm        description                          value

FILENAME   Name of Input File                   "VIEW.DAT"


TERMINAL   Selection of Plotting Device         "YES"


Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

Figure 2-9. VIEW Tutor Display

```
PCDS — PILOT CLIMATE DATA SYSTEM
COMPONENTS

  Catalog Subsystem

  Inventory Subsystem

  Data Access Subsystem

  Data Manipulation Subsystem

  Graphics Subsystem


<FORM FEED>
GRAPHICS SUBSYSTEM
CAPABILITIES

Create Two-Dimensional Representations of Data

Create Three-Dimensional Representations of Data

Create Text Charts

Provide Post-Processing of Graphical Displays
```

Figure 2-10. Sample Viewgraph Input File

2.2.2 Output Specifications

Figure 2-11 shows the first tutor display of viewgraph output options and their associated default values. By selecting various options from the tutor parameters described below, the user may enhance the output of the created input file. All selected options will affect each page included in this viewgraph file. Figure 2-12 shows the results of the VIEW proc for the sample input file in Figure 2-10. Here, BULLETS, a TITLE of THREE lines, a NARROW border, HALF spacing, LEFT justification, and CROM font style were specified.

Following the initial viewing, the user may find it necessary to modify and then repeat the display of the input file. Therefore, it is suggested that the user first view the contents of the input file with a limited number of options (e.g., no border, STPL font, etc.) and if necessary, enter TAE COMMAND mode, edit the input file to achieve the desired results, and repeat the procedure.

2.2.2.1 Color

The user may select colors for various regions of the viewgraph page. These areas, the main body, the title line(s), and the border may be output in different colors. However, if the output is directed to a black and white device, the color selection has no effect upon the viewgraph display. The following list details the color definitions:

0. Default device color
1. Black
2. Red
3. Green
4. Yellow (Brown on the HP plotting device)
5. Blue
6. Magenta (Violet on the HP plotting device)
7. Cyan (Orange on the HP plotting device)
8. White

If title line(s) and/or a border is selected, the colors for these regions are entered through subsequent tutor displays.

2.2.2.2 Bullets

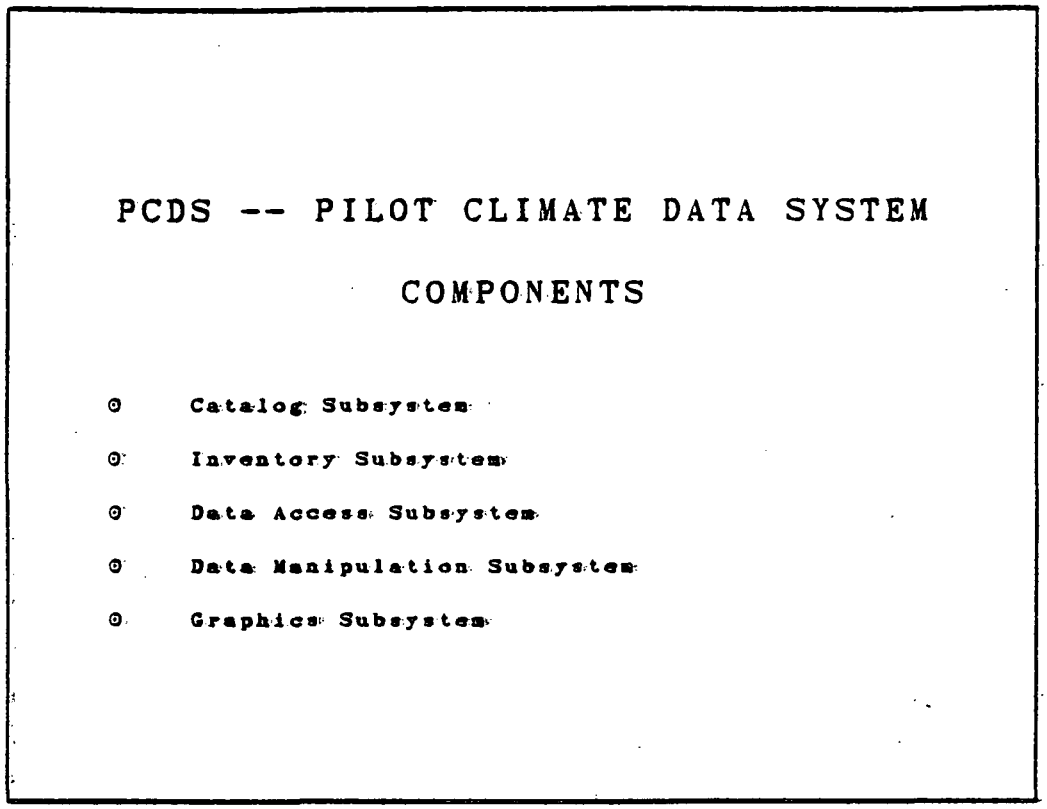
The user may optionally specify that "bullets" are to precede non-title lines in the viewgraph output. If selected, all non-title, non-blank lines of all pages of output will be annotated with bullets (see Figure 2-12).

2.2.2.3 Title

Title lines may be included in the file. If multiple pages are present in the input file, the number of title lines applies to all pages. Blank lines may be included in the title. Upon output, the title line(s) will be enlarged and centered on the page; therefore, these lines should be left-justified in the input file (see Figure 2-10). If a title is indicated, the user will view the tutor display shown in Figure 2-13.

```
Tutor: proc "VIEWOPT", library "PCDS$LIB"                          Pg 1+

                        Viewgraph Output Charts

  parm        description                          value
  ----        -----------                          -----

 COLOR       Color for the Main Body                          0.0
 BULLET      Annotation with Bullets          "NO"
 TITLE       Title in Input File              "NO"
 BORDER      Border on Viewgraph              "NONE"
 SPACE       Spacing of Lines                 "SINGLE"
 JUSTIFY     Type of Justification            "LEFT"
 FONT        Font Style                       "STPL"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?

Tutor: proc "VIEWOPT", library "PCDS$LIB"                          Pg 2.

                        Viewgraph Output Charts

  parm        description                          value
  ----        -----------                          -----

 HARDCOPY    Hardcopy Device                  "NO"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

Figure 2-11. VIEWOPT Tutor Display



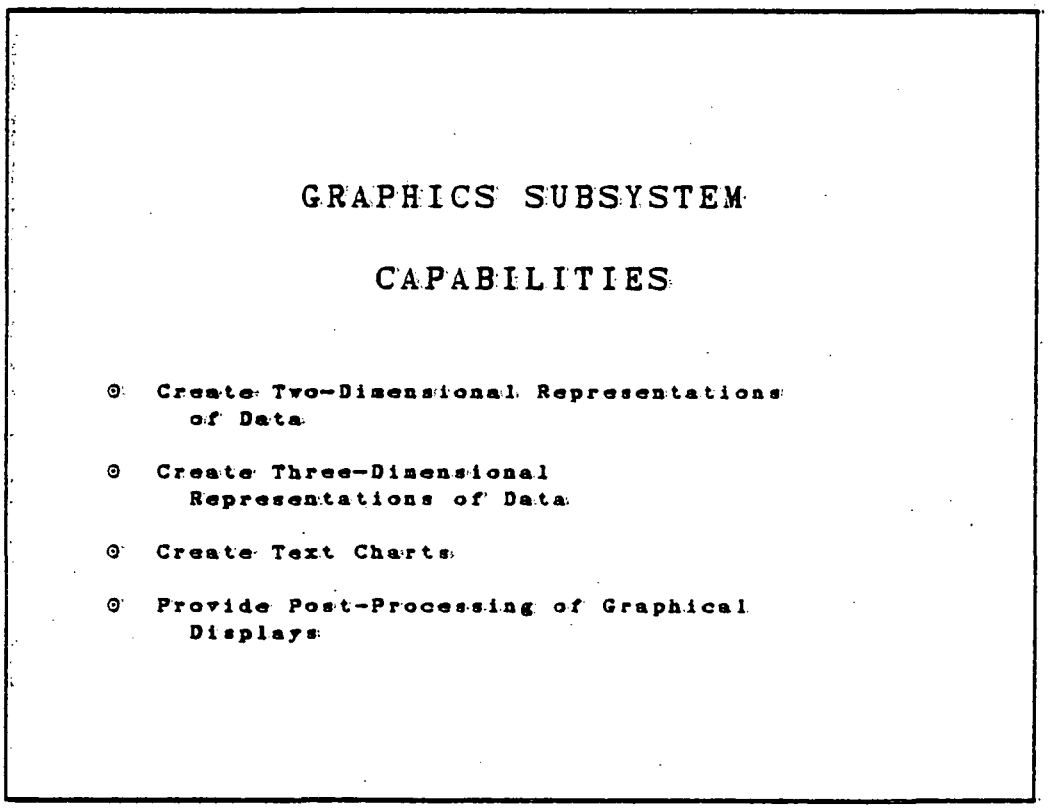


Figure 2-12. Sample VIEWgraph Output

Tutor: proc "TITLES", library "PCDS$LIB" Pg 1.

Titles for Viewgraph Output Charts

parm	description	value	
LINES	Number of Lines in the Title		1
UNLINE	Underline the Title Line(s)	"NO"	
COLOR	Color for the Title		0.0

Enter: parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?

Figure 2-13. TITLES Tutor Display

Here, the user may enter the number of lines to be considered a title as well as the color of these lines. Optionally, the user may request the title line(s) to be underlined. Neither blank title lines nor blank spaces will be underlined.

2.2.2.4 Border

Each page of output may be enclosed within a border of selected width. The user may select the type of border from the following:

NONE	No border
NARROW	One line-width
MEDIUM	Three line-widths
WIDE	Five line-widths

See Figure 2-6 for samples of these border width options. If a border is selected, the user will view the tutor display shown in Figure 2-14 to select a color for the border.

2.2.2.5 Spacing

The user may select the spacing of viewgraph output lines; naturally, the type of spacing will affect the number of lines which will fit on a page of output. Therefore, an excess of lines because of the spacing selection may cause the upper and lower lines of the page to be "clipped" from the resulting output (each viewgraph page is centered vertically on output). In other words, a full page is not continued on a second display; it is centered thus removing the top and bottom portions. The following options (and resulting page sizes) are available:

SINGLE	Allows 40 lines per page (not including title lines)
HALF	One-half line-width inserted between each line; allows 27 lines per page (not including title lines)
DOUBLE	One full line-width inserted between each line; allows 20 lines per page (not including title lines)

Figure 2-15 shows the effects of the spacing selections on a particular viewgraph input file.

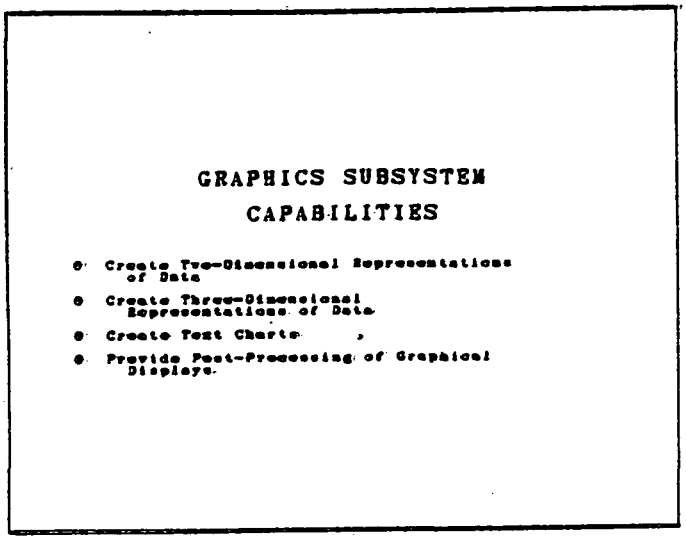
2.2.2.6 Justification

The type of justification for all non-title lines on each page of output may be specified. The following options are available:

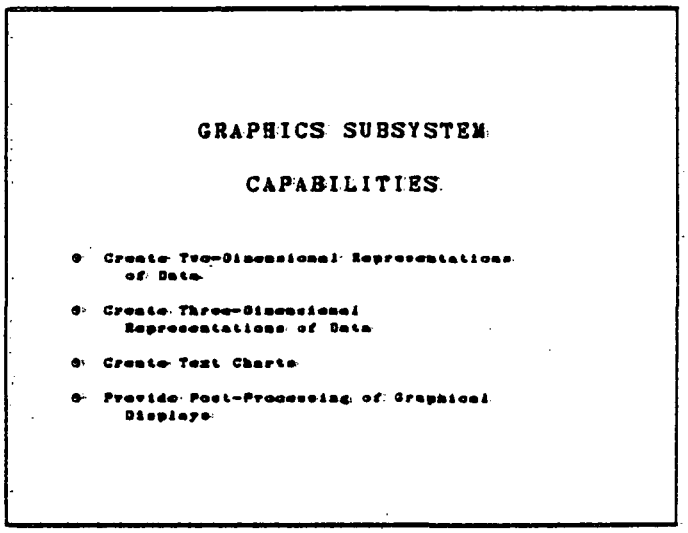
LEFT
CENTER
RIGHT

```
Tutor: proc "BORDERS", library "PCDS$LIB"                          Pg 1.

                Inserting Borders on Text and Viewgraph Output Charts

   parm          description                                  value

 COLOR      Color for the border                              0.0


Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

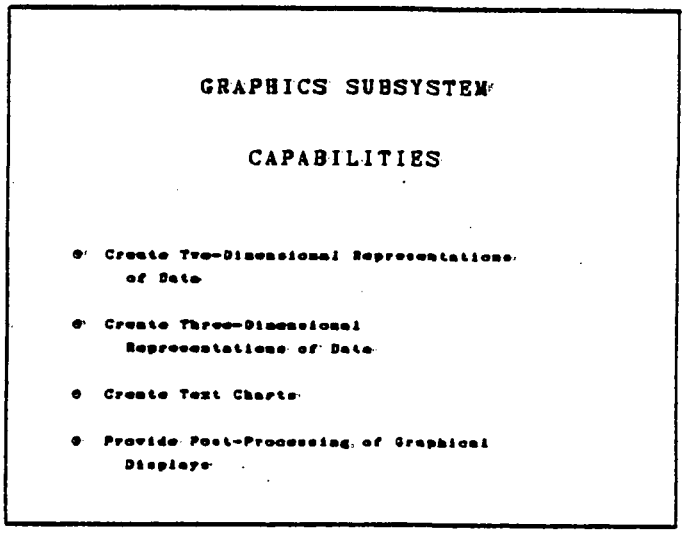
Figure 2-14. BORDERS Tutor Display



SINGLE Spacing



HALF Spacing



DOUBLE Spacing

Figure 2-15. VIEW Spacing Options

2.2.2.7 Font Style

The user may specify one of several font styles. The title line(s) and the body of all pages of viewgraph output will be drawn in the specified font. The following fonts are available:

STPL	Simple characters
SROM	Simplex Roman font
DROM	Duplex Roman font
CROM	Complex Roman font
TROM	Triplex Roman font
CITA	Complex Italic font
TITA	Triplex Italic font
SSCR	Simplex Script font
CSCR	Complex Script font
GENG	Gothic English font

See Figure 2-8 for samples of the various font styles. The complete character set for each font can be found in Appendix C.

2.2.2.8 Hardcopy

If a hardcopy device is connected to the current display terminal, all screen output may be printed by specifying "YES" to the HARDCOPY option. Alternatively, the user may enter a plot file name to archive the results for display by the PCDS GRAPHICS Subsystem Post-Processor. A more detailed description of the Post-Processor procedure is presented in the next section.

2.2.3 Hardcopy Output

The GRAPHICS Post-Processor provides the user a means for redisplaying plots generated by the CHARTS utility that have been saved in a plot file (i.e., TERMINAL was set to a file name in the first VIEW tutor or HARDCOPY was set to a file name in the second VIEW tutor). The Post-Processor allows the user to specify the input file and the output device. The output may be a terminal, the black and white printer/plotter (VERSATEC), the color HP plotting device, or a tape for later slide production. A device for creating color viewgraphs directly on transparencies will be available in the future. For specific hardcopy devices, the user will be prompted for such items as output medium, size, etc. Figure 2-16 illustrates the first tutor display for the Post-Processor.

Each "printed" display may consist of one to four plots on a single page. Therefore, if several viewgraph pages are included in the plot file, the user may place up to four on one plot display. However, if one page per plot is desired, the user must run the Post-Processor procedure for each page. When two plots are selected, the layout may be split vertically or horizontally. The second tutor display for the Post-Processor is shown in Figure 2-17. Here, the user may enter which plot(s) are to be included in the display. For example, if the fourth plot in the input file is to be the only plot on the display, the user enters PLOTNO(1)=4, i.e., the first plot, here, the only one, is to be

```
Tutor: proc "PPOSTPROC", library "PCDS$LIB"                    Pg 1+

                        Graphics Post Processor

   parm          description                              value
   ----          -----------                              -----

 INFILE     Input Plot file                          " "

 OUTDEV     Output device                            "TERM"

 DELETE     Deletion code                            "N"

 TITLE      Plot Title                               " "


 SAVEPLOT   Save code for PDF format file            "N"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?

Tutor: proc "PPOSTPROC", library "PCDS$LIB"                    Pg 2.

                        Graphics Post Processor

   parm          description                              value
   ----          -----------                              -----

 SKIPREAD   Skip code for skipping the input         "N"
            file

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

Figure 2-16. Post-Processor Tutor Display

```
Tutor: proc "PLOTIN", library "PCDS$LIB"                          Pg 1.

                    Plot Specific Information

   parm          description                          value

 PLOTNO     Plot number specification                  1        (1)
            Enter zeroes - no blanks                   0        (2)
            Enter all four plot numbers                0        (3)
                                                       0        (4).

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
?
```

Figure 2-17. Plot Number Tutor Display

the fourth plot found in the input file. As previously stated, subsequent tutor displays may appear for specific hardware options.

3. Reserved Characters

Several reserved characters may be used within lines of a text or viewgraph input file. These characters change the display of all subsequent line elements until the end of the input line or another reserved character is encountered. These reserved characters and their functions are as follows:

@ ("at" sign)	Font change character.
~ (tilde)	Superscript character.
_ (underscore)	Subscript character.

3.1 Font Style Character

In both the TEXT and VIEW options, the user may specify a font style which will apply to all lines of all pages of the generated output. However, it is often desirable to change the character style within a text in order to emphasize a word or sentence or to insert a special symbol or mathematical character. This alteration of font can be accomplished by inserting the "Font Escape Character" followed by the full four-letter font name. Any of the previously mentioned fonts (see Section 2.1.2.5 or 2.2.2.7) may be used here. In addition, many special characters may be included in the display by using one of the following fonts:

SGRE	Simplex Greek Font
CGRE	Complex Greek Font
GGER	Gothic German Font
GITA	Gothic Italic Font
CCYR	Complex Cyrillic Font
LMAT	Lowercase Mathematics Font
UMAT	Uppercase Mathematics Font
ASTR	Astrology Font
METE	Meterological Font
MUSI	Music Font
SYMB	Symbols Font

The complete character set for each font can be found in Appendix C.

In order to change the font within a line of text, the user must insert an "@" sign followed by the four-letter font name. All characters following this string and contained on the input line will be displayed in the named font; however, the character style will return to the pre-set font on all subsequent lines. If a font string is inserted and the user wishes to return to the pre-set font (or display a second font style) prior to the end of the line, an "@" sign followed by the pre-set font name (or alternate font name) must follow the last character to be output in the alternate font. It should also be noted that the font name

must be in the same case as the last alphabetic character preceding the "@" sign (all input lines are cycled through a procedure where changes in case are marked).

The viewgraph input file shown in Figure 3-1 illustrates the use of this font-change process; the output from this file is given in Figure 3-2. Here, the font style was altered from the pre-set Triplex Roman (TROM) font in order to italicize words and take advantage of several special symbols. For example, the phrase "Taylor Expansion" is preceded by the string "@tita" and succeeded by the string "@trom". Upon output, this phrase is placed in the Triplex Italic font and the remainder of the line is returned to the Triplex Roman font (i.e., the pre-set font style). The final line of the input file illustrates the use of the Lowercase Mathematical Font (lmat) in order to display a special character. This character is alphanumerically represented by a "?" and will be displayed as an inequality sign (see Appendix C). To output all subsequent characters in the pre-set font, the string "@trom" is inserted following this special character. In both of these examples, the font name following the "@" sign is in lowercase letters since the preceding alphabetic character is also in this case.

3.2 Subscript and Superscript Character

The user may subscript or superscript characters by the insertion of a reserved character. The Subscript Escape Character is the "_" (underscore); the Superscript Escape Character is the "~" (tilde). Each occurrence of the subscript character will lower the position of succeeding characters approximately one-third of the line-height; similarly each occurrence of the superscript character will raise the position of succeeding characters approximately one-third of the line-height. When the end of a line is reached, the scripting level is returned to the zero position. If a subscript is inserted and the user wishes to return to the normal position prior to the end of the line, a superscript character must follow the last character to be subscripted. Likewise, a subscript character must follow the last character to be superscripted.

The viewgraph input file shown in Figure 3-1 illustrates the use of this subscripting and superscripting process in order to output several mathematical expressions; the output from this file is given in Figure 3-2. In the first formula, the superscript character is used to indicate exponentiation. Following the completion of the line, the scripting level is returned to the zero position. Alternatively, in the input phrase "r_n~(x)", the "_" causes the character "n" to be subscripted; the "~" following this "n" causes the remainder of the input line to return to the zero position.

```
TAYLOR'S FORMULA

The @titaTaylor Expansion@trom of the function

     (1-x)~-1

is

     1 + x + x~2_ + x~3_ + ...  if @symb(@tromx@symb(@trom<1

with remainder r_n~(x) of

     (1-x)~-1_ if x@1mat?@trom1
```

Figure 3-1. Sample Reserved Character Input File

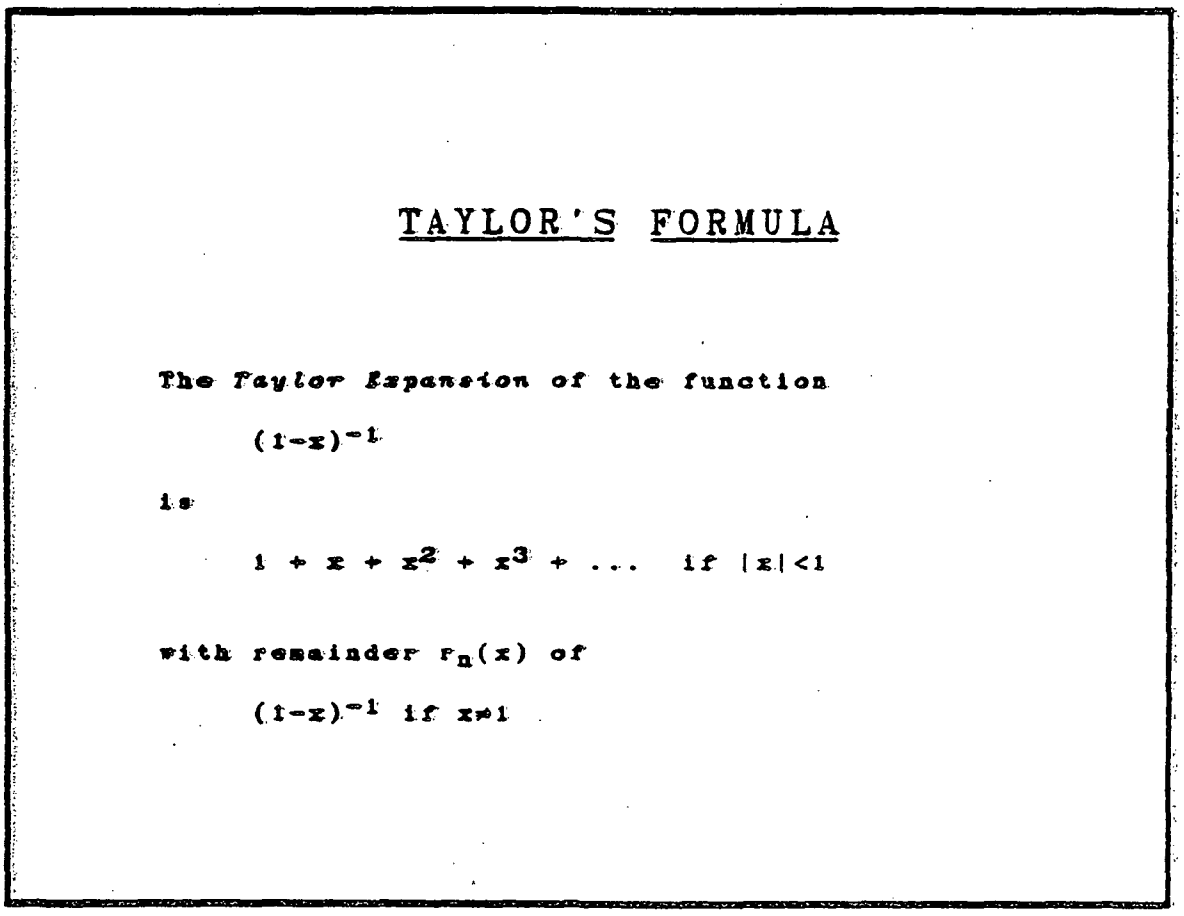


Figure 3-2. Sample Reserved Character Output

4. Bibliography

1. Carlson, Patricia A., C. A. Emmanuelli, E. L. Harris, and D. C. Perkins. Primer for the Transportable Applications Executive, Version 1.0. NASA/GSFC. January, 1984.

2. The Pilot Climate Data Base Management System (PCDBMS) User's Guide. NASA/GSFC, Information Management Branch. December, 1983.

3. Template Reference Manual, Version 3. Megatek Corporation. December, 1983.

4. User's Reference Manual for the Transportable Applications Executive, Version 1.2. Century Computing, Incorporated 82-TAE-USRV1F. March, 1984.

Appendix A — Use of the PCDS

Use of the PCDS

A.1 General Information

This appendix provides brief direction in the use of the Pilot Climate Data System (PCDS). For more detailed instruction, the user is directed to consult the PCDS User's Guide.

The user interface of the PCDS is the Transportable Applications Executive (TAE). This system provides menu selection displays, tutor (option selection) displays, and on-line help information. TAE provides the inexperienced user an easy method to select the appropriate programs and the required input for these programs. Alternatively, TAE facilitates program access for the experienced user.

In order to access the PCDS, the user must have a user ID and password for this VAX 11/780 computer system. The log-on procedure is as follows:

```
<RETURN>

Username: uname <RETURN>
Password: pword <RETURN> (the password will not be displayed)

(Computer Messages)

$
```

Following the successful sign-on to the computer, the user must activate the PCDS software system by entering the following command:

```
$ @PCDSUSER:START
```

Following activation of the PCDS, the user may be required to enter the type of terminal he is currently using. This is required for any remote terminal not directly connected to the VAX. The user will then view PCDS system messages. A carriage return following this PCDS banner will advance the user to the initial (or root) menu (see Figure A-1).

A.2 Use of TAE

A.2.1 General

TAE provides a consistent interface to all programs and program inputs in the PCDS. TAE utilizes menus for program selection, tutor displays for specifying inputs to these programs, a command mode for program selection by experienced users, and help features. This section provides basic instruction in the use of the TAE menu, tutor, command, and help functions. For more detailed information, the user should consult the TAE Primer and/or the TAE User's Guide.

```
Menu:   "ROOT", library "PCDS$LIB:"

                    PCDS Version 3.0 Subsystems Menu

 1)     CATALOG Subsystem Menu                          [ CATALOG ]

 2)     INVENTORY Subsystem Menu                        [ INVENTORY ]

 3)     DATA ACCESS Subsystem Menu                      [ DACCESS ]

 4)     DATA MANIPULATION Subsystem Menu                [ CDFUTIL ]

 5)     GRAPHICS Subsystem Menu                         [ GRAPHICS ]


Enter:  selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
?
```

Figure A-1. PCDS ROOT Menu

TAE displays (e.g., Menu, Tutor, and Help screens) follow several conventions. First, multiple pages of information are indicated by a "+" following the page number on the first line of the display. Second, valid entries to be typed following the "?" prompt are listed on the line preceeding the prompt line. Third, command and parameter names may be abbreviated with the first several characters which uniquely identify the designator (e.g., EX for EXIT, R for RUN, M for MENU, etc.).

A.2.2 Help Mode

TAE provides help information on itself as well as on individual procedures and their required inputs. The available help options are as follows:

<RETURN>	Move to the next page of the help display. The first page will be the "next" page after the last page.
PAGE n	Display page number "n".
EXIT	Exit the help display and return to menu or tutor mode.

For example, when a menu is displayed, the user may enter "HELP" following the "?" prompt. The resulting information aids the user in TAE functions. Alternatively, to receive instruction on a particular menu item, the user may enter "HELP n" where "n" is the number in question.

A.2.3 Menu Mode

Following a successful access of the PCDS, the user will view the initial (or root) menu of the PCDS system (see Figure A-1). A list of valid command entries followed by a prompt line is located at the bottom of the menu mode screen. The user may enter one of these commands following the "?" prompt. The available prompt-line options are as follows:

HELP	Display information on the operation of TAE.
HELP *	Display information on the current menu.
HELP n	Display information on entry "n" of the current menu.
HELP proc	Display information on the named program (following the menu item and in parentheses or brackets).
BACK	Return to the previous menu.
TOP	Return to root (first) menu.

MENU menuname	Activate menu "menuname". If no menu name is given, the current menu is redisplayed. The menu name is shown to the right of the initial menu display line.
COMMAND	Exit the MENU mode and prompt for a TAE Command Language (TCL) command.
LOGOFF	Log the user off the system.

To access one of the PCDS Subsystems, the user should now enter a number, one through five. The user will eventually access a program (or "proc" in TAE terminology) by making successive selections through menus.

A.2.4 Tutor Mode

After the user has successfully accessed a "proc", a "Tutor Display" will appear. This tutor display allows the user to enter input parameters which the program requires. Initially, the screen shows the parameter name, description, and default value. Many of these parameters have default values. As the user selects values for these options, the tutor screen will be updated. In most cases, the entries made will be validated. A list of valid command entries followed by a prompt line is located at the bottom of the tutor screen. The user may enter one of these commands following the "?" prompt. The available prompt-line options are as follows:

<RETURN>	Display the next page of the tutor display.
parm=value	Assign a new value to the option named "parm".
HELP	Display help information on TAE tutor operation.
HELP *	Display text describing the current program.
HELP parm	Display detailed text describing the option "parm".
PAGE n	Display page "n" of the tutor display.
PAGE parm	Display the page containing the option "parm".
SHOW parm	Display the value entered for the option "parm".
RUN	Execute the program with the selected options.

EXIT	Terminate the tutor session without running the program.
SAVE filename	Save the current option values in a file named "filename".
RESTORE filename	Restores the option values from the file named "filename".
RESTORE LAST	Restore the option values from the most recent tutor RUN.

For example, valid entries for the input parameters may be obtained by entering "HELP" followed by the parameter name. Once the value for a particular parameter is selected, it may be entered by typing "PARM=VALUE", where PARM is the option name and VALUE is the selected input. The screen will automatically be updated with this entry. When all entries have been made, the user should enter "RUN" (or "R") to run the program with these values. Depending upon the program, the user may view a prompt line (e.g., "PCDS-VIEWOPT>") indicating that additional tutor displays are available. In order to display these tutors on the screen, the user should enter "TUTOR".

A.2.5 Command Mode

Command mode is a method for an experienced user to gain immediate access to a particular program (proc). The user accesses command mode by entering "COMMAND" while in menu mode. A prompt of "PCDS>" will appear. One of the following commands may now be entered:

DCL	Access the VAX from TAE; a "$_" prompt appears. To return to command mode, enter "TAE".
EXIT	Terminates the TAE session and remains connected to the VAX account (i.e., a "$" prompt appears).
HELP	Display information on the operation of TAE in command mode.
HELP command	Display information on the named command.
LOGOFF	Terminate TAE and log the user off the system.
MENU	Display the current menu.
TUTOR	Display the current tutor screen.
procname	Run the program named "procname".

Thus, by entering a proc name in command mode, an experienced user may run programs without accessing a menu first. If input parameters are required by the program, the user must follow "procname" with "parm=value". Alternatively, the user may enter the proc name only; a message will be displayed indicating input values are required. The user may then enter "TUTOR" to view the tutor display.

When the DCL command is entered, any valid VAX command may follow the "$_" prompt. For example, in the VIEW procedure, the user may need to modify an input file. Therefore, the user may enter "DCL" and invoke one of the VAX editors. After all modifications have been made, the user re-enters TAE and runs the VIEW program again. This process may be repeated until a satisfactory viewgraph display is attained.

A.3 PCDS GRAPHICS Subsystem

As shown in Figure A-2, the CHARTS facility is part of the GRAPHICS Subsystem. Therefore, the user should enter "5" in the root menu display to access the GRAPHICS Subsystem. The GRAPHICS menu, Figure A-3, will now appear. The CHART utility may be used by entering a "3". If a plot file has been created, the Post-Processor may then be accessed through menu item 4.

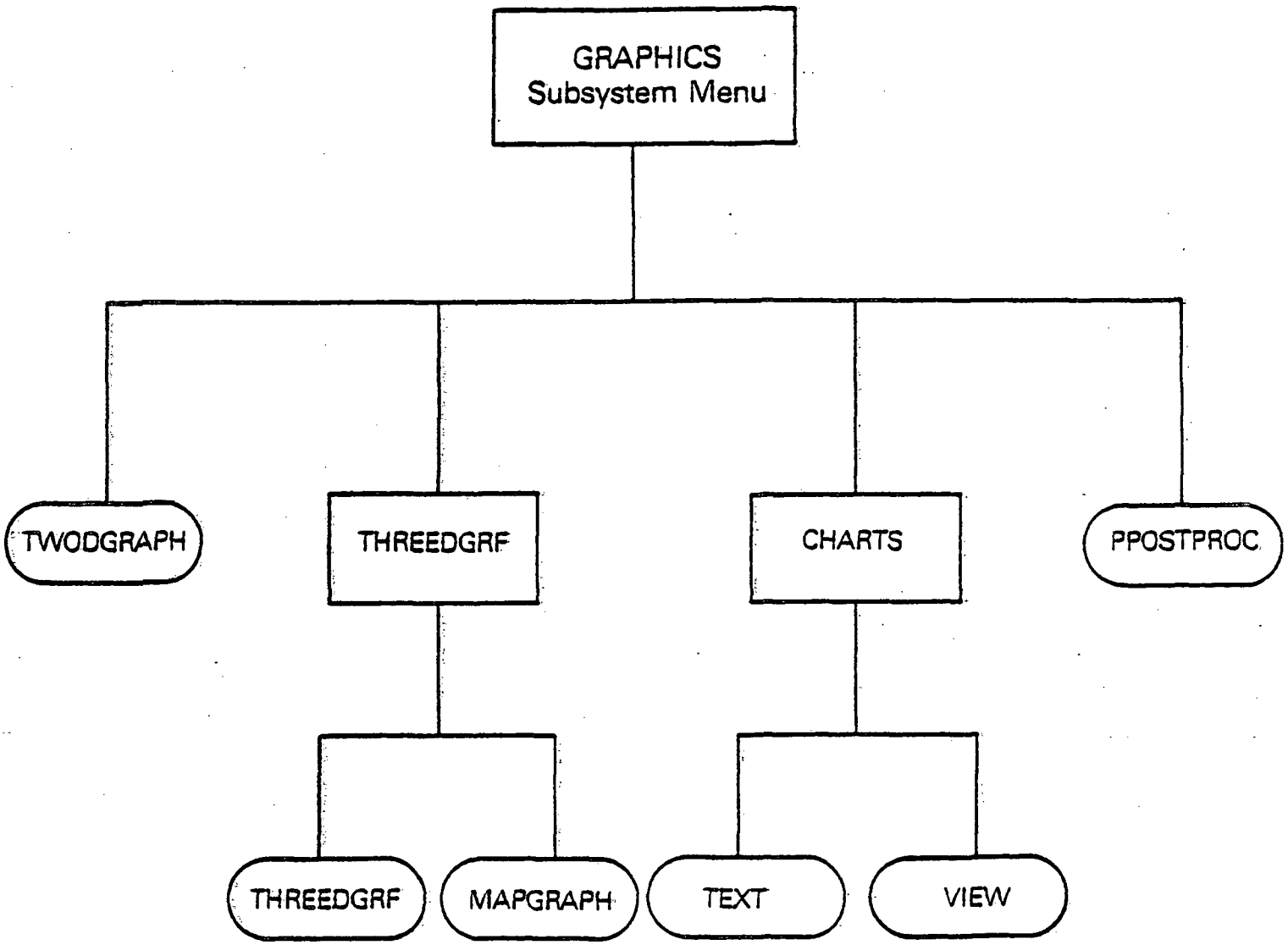


Figure A-2. GRAPHICS Subsystem Structure

```
Menu:   "GRAPHICS", library "PCDS$LIB"

                    GRAPHICS Subsystem Menu

 1)      Graph Two-Dimensional Data                          ( TWODGRAPH )
 2)      Three-Dimensional Graphics Menu                     [ THREEDGRF ]
 3)      Charts Menu                                         [ CHARTS ]
 4)      Run Graphics Post Processor                         ( PPOSTPROC )


Enter:  selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
?
```

Figure A-3. GRAPHICS Subsystem Menu

Appendix B — Sample CHARTS Scenario

Sample CHARTS Scenario

This appendix illustrates a typical user scenario of the PCDS CHARTS utility. In this scenario, the user accesses the Pilot Climate Data System and locates the CHARTS utility. The user first runs the TEXT procedure to print a specified input file. Next the user activates the VIEW process and graphically displays the specified input file. This file is then modified and the VIEW procedure is run a second time. The resulting hardcopy file is then used in the GRAPHICS Subsystem Post-Processor.

In the sample scenario, the left section of each page depicts the screen displays the user will view; the right section provides explanatory notes. A typical screen display consists of a screen or page of input values and one line at the bottom of the page for the user response. In the sample case, the user inputs are shown on this line. In some instances, one screen display will require several responses from the user. The user will enter these values one at a time. The screen is then updated with the value; however, in this scenario, all required responses will be shown on separate lines of a single screen. In addition, all user responses are terminated with a carriage return (<RETURN>), though the <RETURN> is not explicitly shown in the scenario displays.

This scenario is intended to assist a new user in becoming familiar with the CHARTS utility. However, it does not illustrate all capabilites of the facility. The user may obtain additional aid in running the system by utilizing the online HELP facility.

```
Logging on to the PCDS VAX...

Username:  UNAME
Password:  PWORD

                              ...logged on to PCDS, continuing

                    Welcome to VAX/VMS version V3.6

        ***********************************************************************
        ***<<<Pilot Climate Data System(PCDS) Development Facility>>>***
        ***********************************************************************

-----------------------------------------------------------------------------

System Notices:

Equipment Status:

Stand Alone:

-----------------------------------------------------------------------------

$ @PCDSUSER:START
```

The user begins by logging on to the PCDS VAX. Important system information is displayed. The user then invokes the PCDS software.

PILOT CLIMATE DATA SYSTEM

Developed by Goddard Space Flight Center's Information Management Branch

Version 3.0 - February 16, 1984

The PCDS begins by displaying a banner. If a remote terminal is used, the user will be prompted for its type. The user enters a carriage return to continue.

```
Menu:  "ROOT", library "PCDS$LIB:"

                    PCDS Version 3.0 Subsystems Menu

  1)   CATALOG Subsystem Menu                    [ CATALOG ]
  2)   INVENTORY Subsystem Menu                  [ INVENTORY ]
  3)   DATA ACCESS Subsystem Menu                [ DACCESS ]
  4)   DATA MANIPULATION Subsystem Menu          [ CDPUTIL ]
  5)   GRAPHICS Subsystem Menu                   [ GRAPHICS ]


Enter:  selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? 5
```

The first display is the PCDS Subsystem Menu (ROOT menu). To utilize the CHARTS facility, the user accesses the GRAPHICS Subsystem.

Menu: "GRAPHICS", library "PCDSSLIB"

GRAPHICS Subsystem Menu

The GRAPHICS Subsystem Menu is displayed and the user accesses the CHARTS menu.

1) Graph Two-Dimensional Data (TWODGRAPH)

2) Three-Dimensional Graphics Menu [THREEDGRF]

3) Charts Menu [CHARTS]

4) Run Graphics Post Processor (PPOSTPROC)

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? 3

Menu: "CHARTS", library "PCDSSLIB"

Text and Viewgraph Output

The CHARTS Menu provides TEXT and VIEWgraph options. The user selects the TEXT menu item.

1) Text Charts (TEXT)

2) Viewgraph Charts (VIEW)

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? 1

```
Tutor: proc "TEXT", library "PCDSSLIB"                          Pg 1.

                        Text Output Charts

  parm        description                          value
  ----        -----------                          -----

FILENAME  Name of Input File

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? FILENAME=TEXT.TXT
```

The user is then prompted to enter an input file name via a tutor display. The FILENAME parameter is a required entry.

```
Tutor: proc "TEXT", library "PCDSSLIB"                          Pg 1.

                        Text Output Charts

  parm        description                          value
  ----        -----------                          -----

FILENAME  Name of Input File                  "TEXT.TXT"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
```

The user now begins the TEXT output process by running the procedure.

```
Tutor: proc "TEXTOPT", library "PCDSSLIB"                    Pg 1.

                    Text Output Charts

  parm      description                          value
  ----      -----------                          -----
 LINES     Number of Lines in the Title                  0
 UNLINE    Underline the Title Line(s)          "NO"
 BORDER    Border on Text Output                "NONE"
 SPACE     Spacing of Lines                     "SINGLE"
 FONT      Font Style                           "STPL"


Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? LINES=1
? UNLINE=YES
? BORDER=WIDE
? SPACE=DOUBLE
? FONT=CROM
```

The user views a second tutor display. These options define output characteristics. There are default values for all parameters.

```
Tutor: proc "TEXTOPT", library "PCDSSLIB"                    Pg 1.

                    Text Output Charts

  parm      description                          value
  ----      -----------                          -----
 LINES     Number of Lines in the Title                  1
 UNLINE    Underline the Title Line(s)          "YES"
 BORDER    Border on Text Output                "WIDE"
 SPACE     Spacing of Lines                     "DOUBLE"
 FONT      Font Style                           "CROM"


Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
  Job 23 entered on queue SYSBATCH
Press RETURN key for menu
```

All required parameters are entered. The program is then run. TEXT output will be directed to the black and white printer/plotter for printing later.

Menu: "CHARTS", library "PCDSSLIB"

Text and Viewgraph Output

1) Text Charts (TEXT)

2) Viewgraph Charts (VIEW)

Following completion of the TEXT request, the user is returned to the CHARTS Menu. The VIEW procedure is selected.

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? 2

```
Tutor: proc "VIEW", library "PCDSSLIB"                          Pg 1.

                        Viewgraph Output Charts

  parm        description                              value
  ----        -----------                              -----

FILENAME  Name of Input File

TERMINAL  Selection of Plotting Device          "YES"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? FILENAME=VIEW.TXT

Tutor: proc "VIEW", library "PCDSSLIB"                          Pg 1.

                        Viewgraph Output Charts

  parm        description                              value
  ----        -----------                              -----

FILENAME  Name of Input File                "VIEW.TXT"

TERMINAL  Selection of Plotting Device          "YES"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
Parameters Requested:  COLOR, BULLET, TITLE, BORDER, SPACE, JUSTIFY, FONT, and
HARDCOPY
PCDS-VIEWOPT>TUTOR
```

The required input file name is entered in the first tutor display.

Additional parameters are then requested. To view a tutor display for these options, the user enters "TUTOR".

```
Tutor: proc "VIEWOPT", library "PCDSSLIB"                    Pg 1+

                    Viewgraph Output Charts

  parm      description                          value

  COLOR     Color for the Main Body                        0.0
  BULLET    Annotation with Bullets              "NO"
  TITLE     Title in Input File                  "NO"
  BORDER    Border on Viewgraph                  "NONE"
  SPACE     Spacing of Lines                     "SINGLE"
  JUSTIFY   Type of Justification                "LEFT"
  FONT      Font Style                           "STRL"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? BULLET=YES
? TITLE=YES
? BORDER=MEDIUM
? SPACE=HALF
? FONT=TROM
```

The user is then prompted with the second tutor display of VIEW options. Several parameters are entered to replace the default values.

```
Tutor: proc "VIEWOPT", library "PCDSSLIB"                    Pg 1+

                    Viewgraph Output Charts

  parm      description                          value

  COLOR     Color for the Main Body                        0.0
  BULLET    Annotation with Bullets              "YES"
  TITLE     Title in Input File                  "YES"
  BORDER    Border on Viewgraph                  "MEDIUM"
  SPACE     Spacing of Lines                     "HALF"
  JUSTIFY   Type of Justification                "LEFT"
  FONT      Font Style                           "TROM"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? <RETURN>
```

A "+" following the page number indicates the existence of additional pages of this tutor display. The user enters <RETURN> to view the next page.

```
Tutor: proc "VIEWOPT", library "PCDS$LIB"                    Pg 2.

                    Viewgraph Output Charts

  parm        description                          value
  ----        -----------                          -----

HARDCOPY   Hardcopy Device                      "NO"
```

The second page allows the user to enter a request for a hardcopy of the display appearing on the terminal screen. A file name entered here indicates the results will later be output by the GRAPHICS Subsystem Post-Processor.

```
Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? HARDCOPY=VIEW

Tutor: proc "VIEWOPT", library "PCDS$LIB"                    Pg 2.

                    Viewgraph Output Charts

  parm        description                          value
  ----        -----------                          -----

HARDCOPY   Hardcopy Device                      "NO"
```

The user runs the procedure. The indication of a title in the second tutor prompts the user for additional options. The user enters TUTOR to view a third tutor display.

```
Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
Parameters Requested:  LINES, UNLINK, and COLOR.
PCDS-TITLES>TUTOR
```

```
Tutor: proc "TITLES", library "PCDSSLIB"                    Pg 1.

                    Titles for Viewgraph Output Charts

  parm      description                              value
  ----      -----------                              -----

LINES     Number of Lines in the Title                 1

UNLINE    Underline the Title Line(s)          "NO"

COLOR     Color for the Title                          0.0
```

The user accepts the default values for underline and color of the title. However, a title of three lines is indicated.

```
Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? LINES=3
```

```
Tutor: proc "TITLES", library "PCDSSLIB"                    Pg 1.

                    Titles for Viewgraph Output Charts

  parm      description                              value
  ----      -----------                              -----

LINES     Number of Lines in the Title                 3

UNLINE    Underline the Title Line(s)          "NO"

COLOR     Color for the Title                          0.0
```

The procedure is run. The selection of a medium border in the second tutor indicates the need for the specification of an additional option for this border. The user enters TUTOR to view a fourth tutor display.

```
Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
Parameters Requested:  COLOR.
PCDS-BORDERS>TUTOR
```

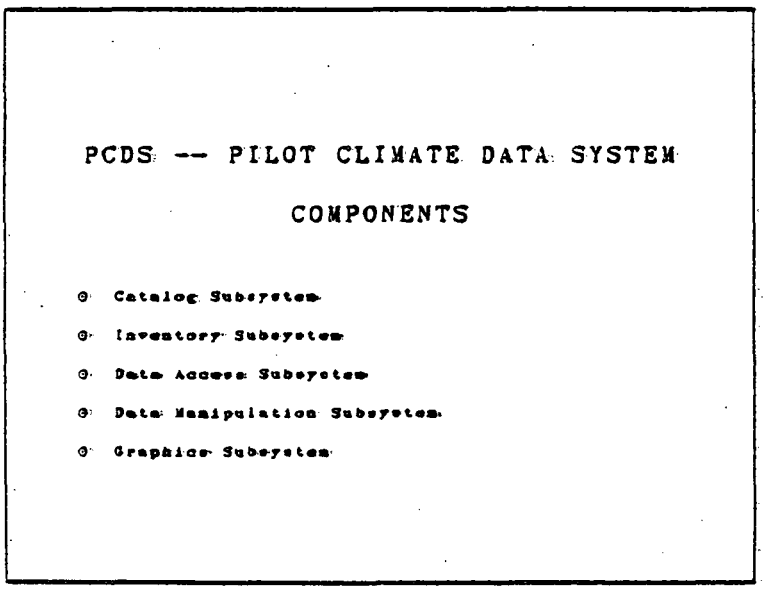
Tutor: proc "BORDERS", library "PCDSSLIB" Pg 1.

Inserting Borders on Viewgraph Output Charts

parm	description	value
COLOR	Color for the border	0.0

Here, the user accepts the default value for the border color. This is the final tutor display. The user enters RUN to display the contents of the input file.

Enter: parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN



The user now views the results of the specified options on the editor-created input file. A carriage return will display a second page, or in this case, advance the user to the CHARTS menu.

Menu: "CHARTS", library "PCDSSLIB"

Text and Viewgraph Output

The user wishes to modify the input file and redisplay the results.

1) Text Charts (TEXT)

2) Viewgraph Charts (VIEW)

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? COMMAND
PCDS>DCL
$_EDIT/EDT VIEW.INP

```
PCDS — PILOT CLIMATE DATA SYSTEM
COMPONENTS

  Catalog Subsystem

  Inventory Subsystem

  Data Access Subsystem

  Data Manipulation Subsystem

  Graphics Subsystem


^Z

SYS$USER1:[uname]VIEW.TXT;2  15 lines
$_TAE
PCDS>MENU
```

The user modifies the input file using the VAX EDT Editor. The editor is exited and the user returns to TAE and displays the CHARTS Menu. The previous viewgraph display scenario is repeated but not shown here.

PCDS -- PILOT CLIMATE DATA SYSTEM

COMPONENTS

- Catalog Subsystem
- Inventory Subsystem
- Data Access Subsystem
- Data Manipulation Subsystem
- Graphics Subsystem

The user now views the results of the specified options on the modified input file. A carriage return will advance the user to the CHARTS menu.

Menu: "CHARTS", library "PCDSSLIB"

Text and Viewgraph Output

1) Text Charts (TEXT)

2) Viewgraph Charts (VIEW)

The user wishes to return to the GRAPHICS Subsystem Menu in order to output the hardcopy file using the Post-Processor. The user enters BACK to proceed to the previous menu.

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? BACK

Menu: "GRAPHICS", library "PCDSSLIB"

GRAPHICS Subsystem Menu

The GRAPHICS Subsystem Menu is displayed and the Post Processor procedure is selected.

1)	Graph Two-Dimensional Data	(TWODGRAPH)
2)	Three-Dimensional Graphics Menu	[THREEDGRF]
3)	Charts Menu	[CHARTS]
4)	Run Graphics Post Processor	(FPOSTPROC)

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? 4

```
Tutor: proc "PPOSTPROC", library "PCDSSLIB"                    Pg 1+

                    Graphics Post Processor

  parm      description                          value
  ----      -----------                          -----

  INFILE    Input Plot file                      " "

  OUTDEV    Output device                        "TERM"

  DELETE    Deletion code                        "N"

  TITLE     Plot Title                           " "


  SAVEPLOT  Save code for PDF format file        "N"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? INFILE=VIEW
? OUTDEV=V80
```

The user now views the Post Processor tutor display. The file name is the same as previously specified for the HARDCOPY parameter. The selected output device is the black and white printer/plotter (the VERSATEC).

```
Tutor: proc "PPOSTPROC", library "PCDSSLIB"                    Pg 1+

                    Graphics Post Processor

  parm      description                          value
  ----      -----------                          -----


  OUTDEV    Output device                        "V80"

  DELETE    Deletion code                        "N"

  TITLE     Plot Title                           " "


  SAVEPLOT  Save code for PDF format file        "N"

Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? <RETURN>
```

A "+" following the page number indicates the existence of additional pages of this tutor display. The user enters <RETURN> to view the next page.

Tutor: proc "PPOSTPROC", library "PCDSSLIB" Pg 2.

Graphics Post Processor

parm	description	value
SKIPREAD	Skip code for skipping the input file.	"N"

The default value is accepted and the program is run. Additional parameters are requested. To view a tutor display for these options, the user enters TUTOR.

Enter: parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
Parameters Requested: PLOTNO.
PCDS-PLOTIN/TUTOR

Tutor: proc "PLOTIN", library "PCDSSLIB" Pg 1.

Plot Specific Information

parm	description	value			
PLOTNO	Plot number specification		1	(1)	One page is in the plot file; therefore, the default value for the plot number is accepted and the program is run. Additional parameters are requested. To view a tutor display for these options, the user enters TUTOR.
	Enter zeroes - no blanks		0	(2)	
	Enter all four plot numbers		0	(3)	
			0	(4).	

Enter: parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
Parameters Requested: MEDIA.
PCDS-V80>TUTOR

```
Tutor: proc "V80", Library "PCDSSLIB"                                   Pg 1.

 This is the data specific to the Versatec V-80 Electrostatic Printer/Plotter

   parm          description                              value
   ----          -----------                              -----

 MEDIA      Type of Media (P,R)                           "P"


Enter:  parm=value, HELP, PAGE, SHOW, RUN, EXIT, SAVE, RESTORE; RETURN to page.
? RUN
  Job 25 entered on queue SYSBATCH
Press RETURN key for menu
```

The default value for fan-fold paper is selected.

Menu: "GRAPHICS", library "PCDSSLIB"

GRAPHICS Subsystem Menu

At the end of the session, the user logs off the PCDS and the computer with a single command.

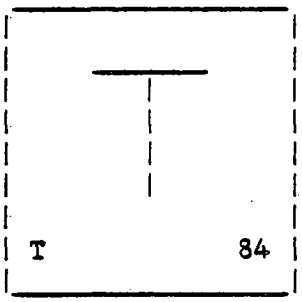
1)	Graph Two-Dimensional Data	(TWODGRAPH)
2)	Three-Dimensional Graphics Menu	[THREEDGRP]
3)	Charts Menu	[CHARTS]
4)	Run Graphics Post Processor	(PPOSTPROC)

Enter: selection number, HELP, BACK, TOP, MENU, COMMAND, or LOGOFF.
? LOGOFF

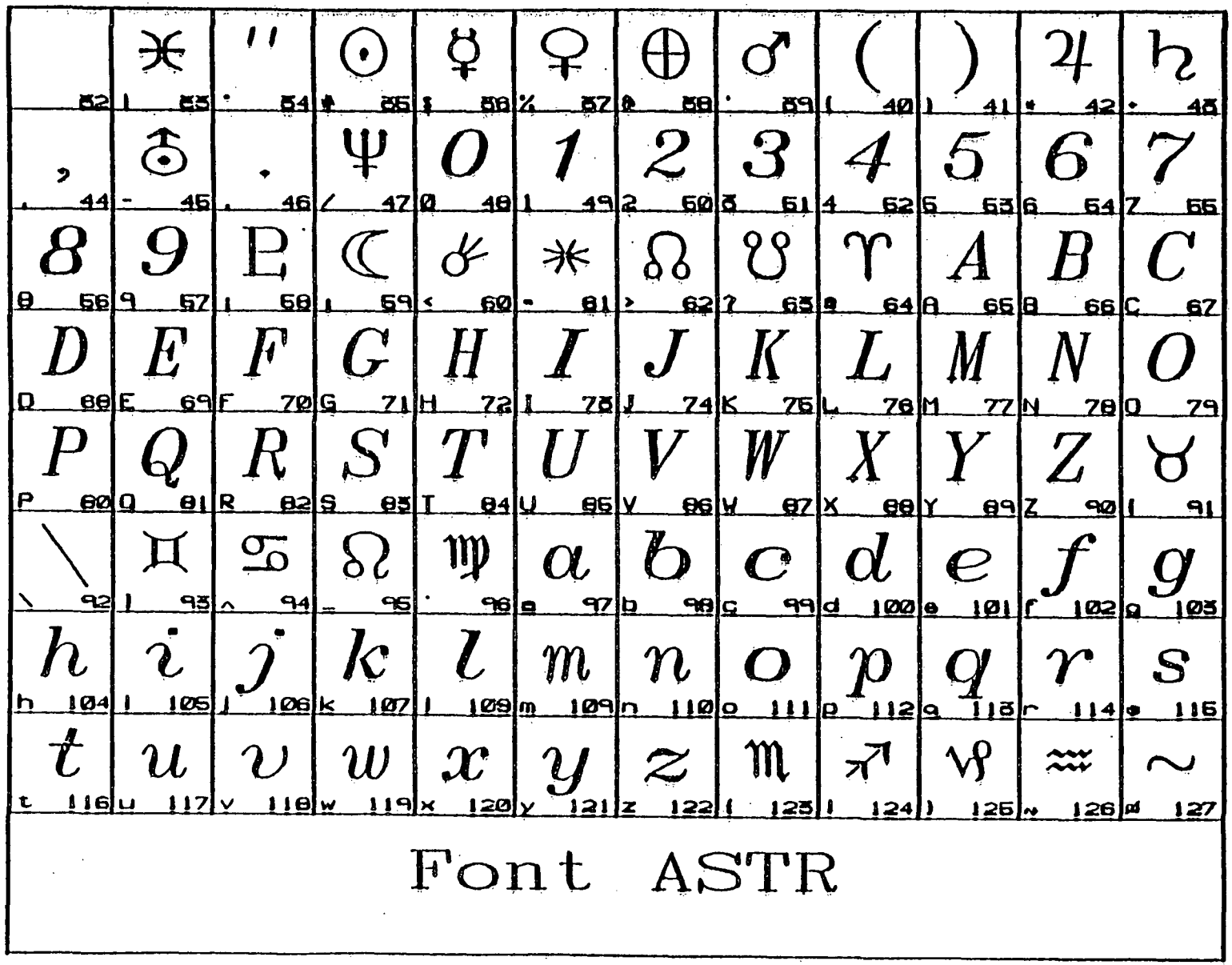
Appendix C — CHARTS Font Styles

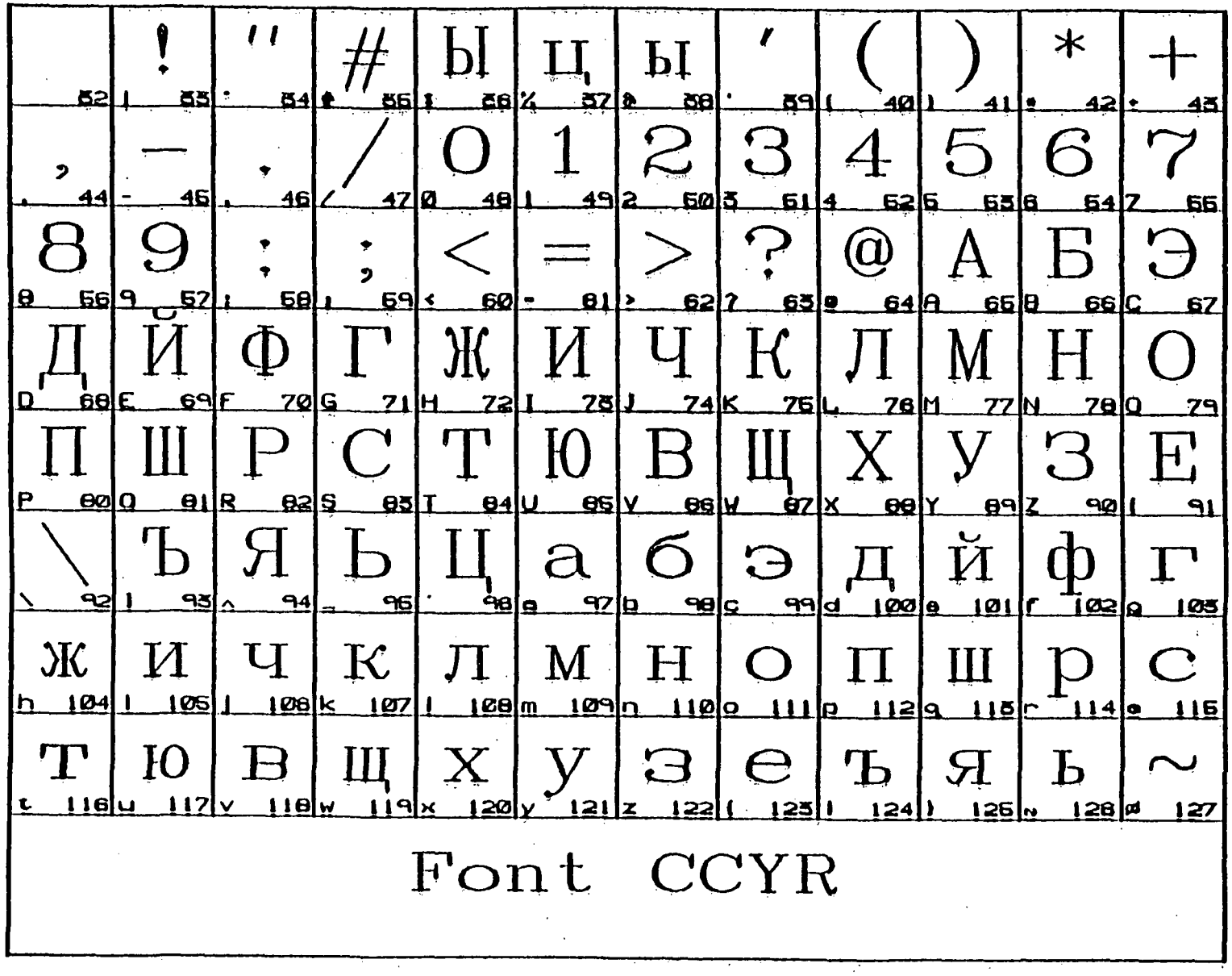
CHARTS Font Styles

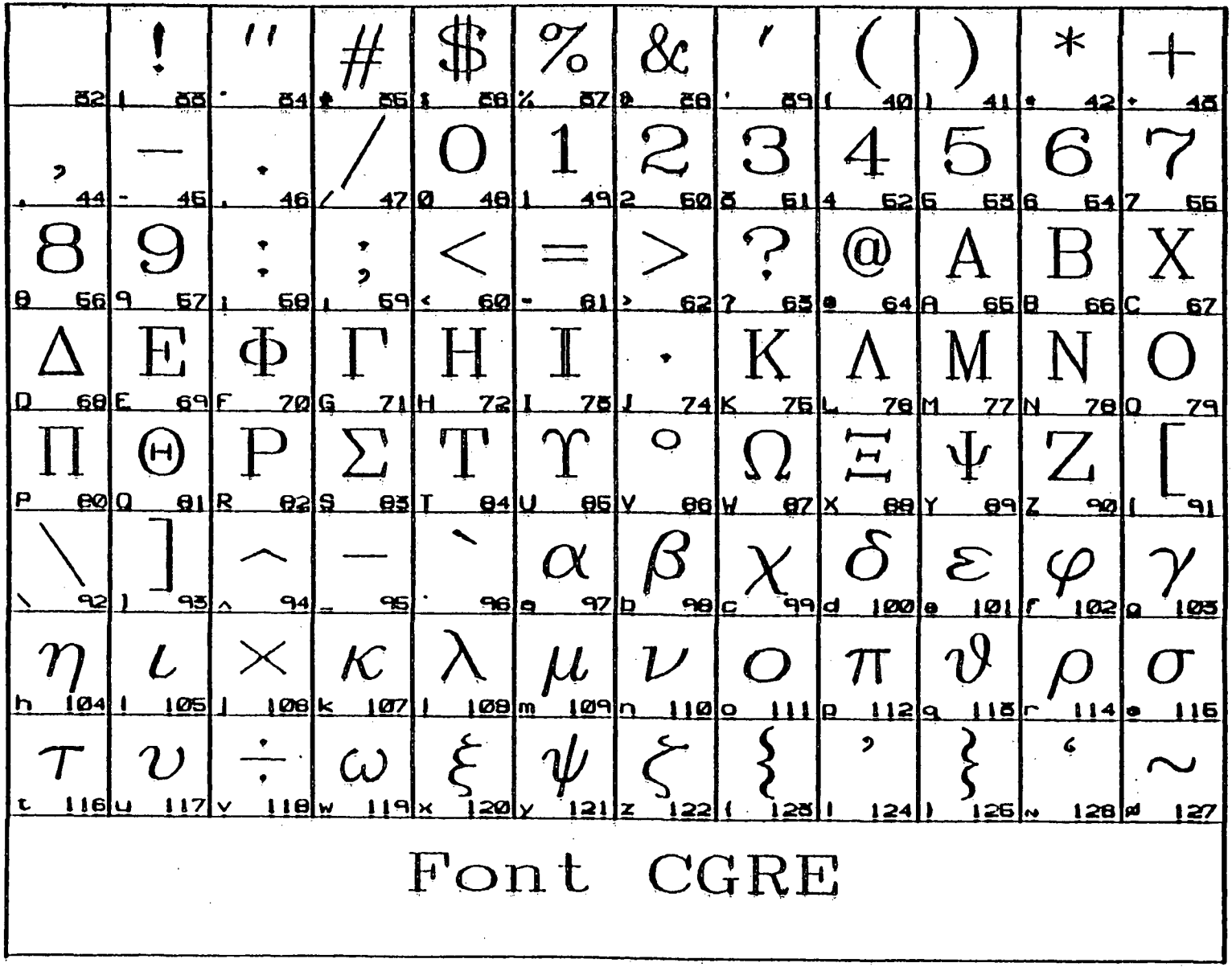
This appendix presents the complete character set for each of the twenty-one supported font styles. Each page shows the characters of one font. Each character is centered within a box; in the lower-left hand corner is the corresponding keyboard character, in the lower-right hand corner is the corresponding ASCII code.

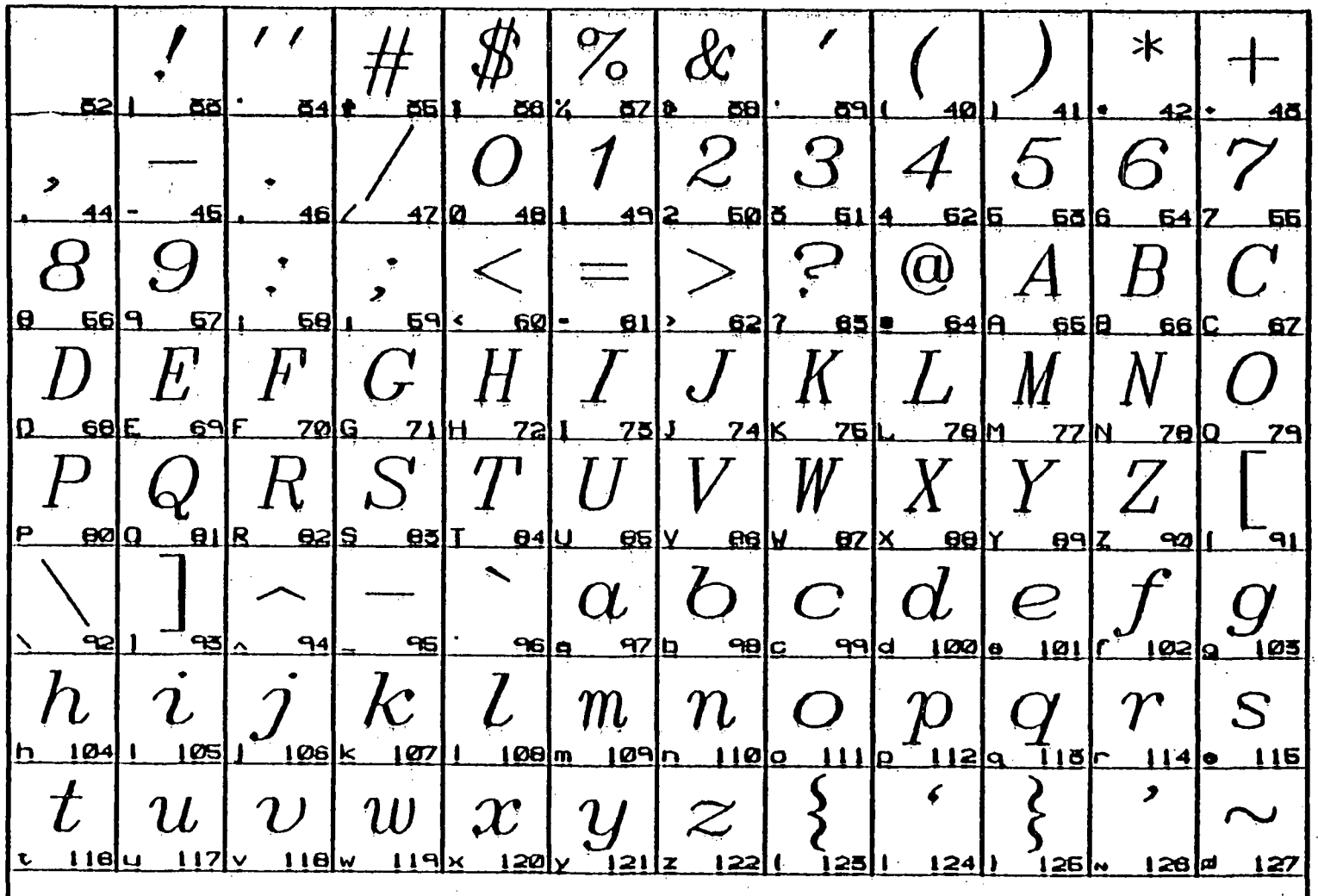


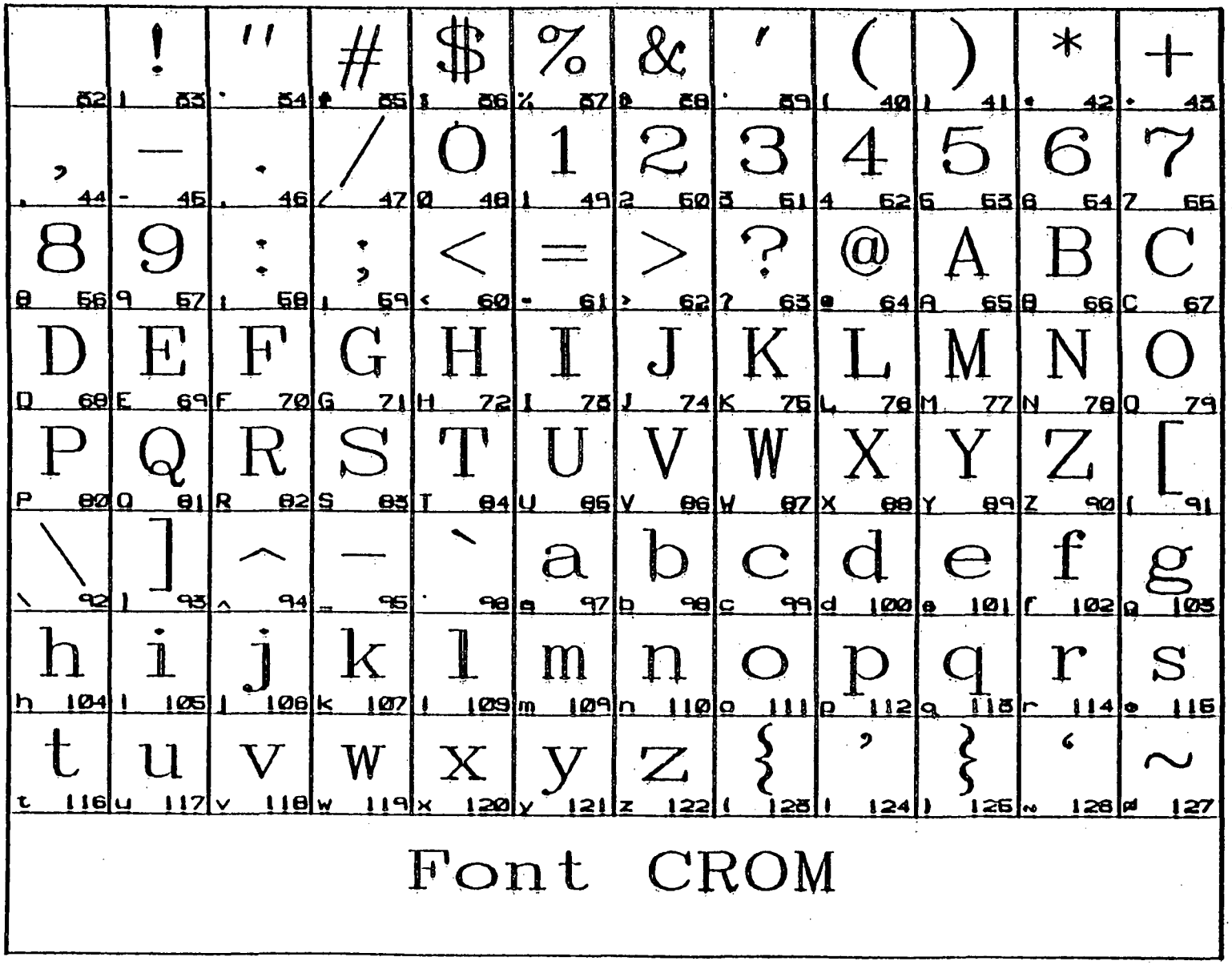
The font name is listed in large letters at the bottom of the page.

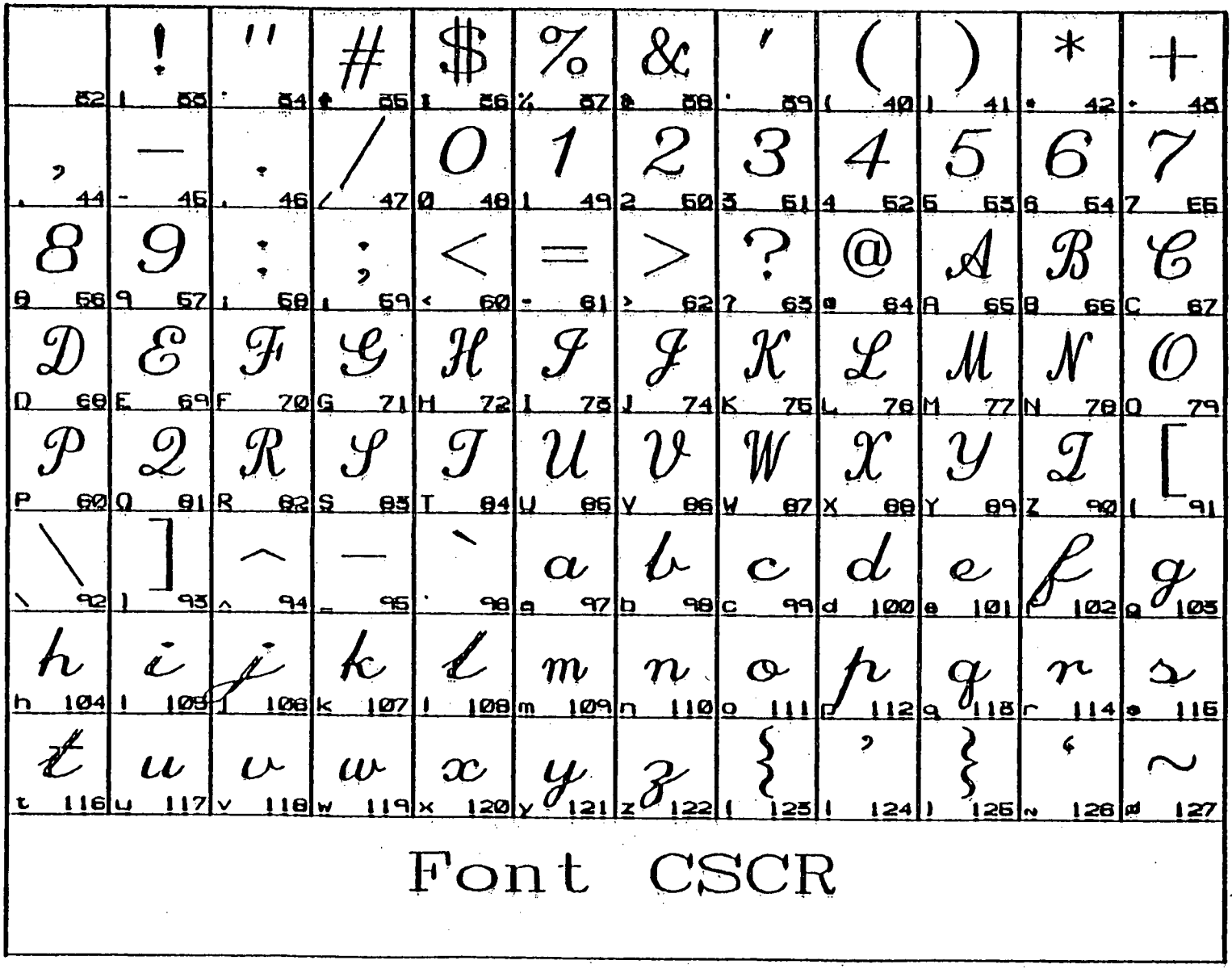

Font ASTR

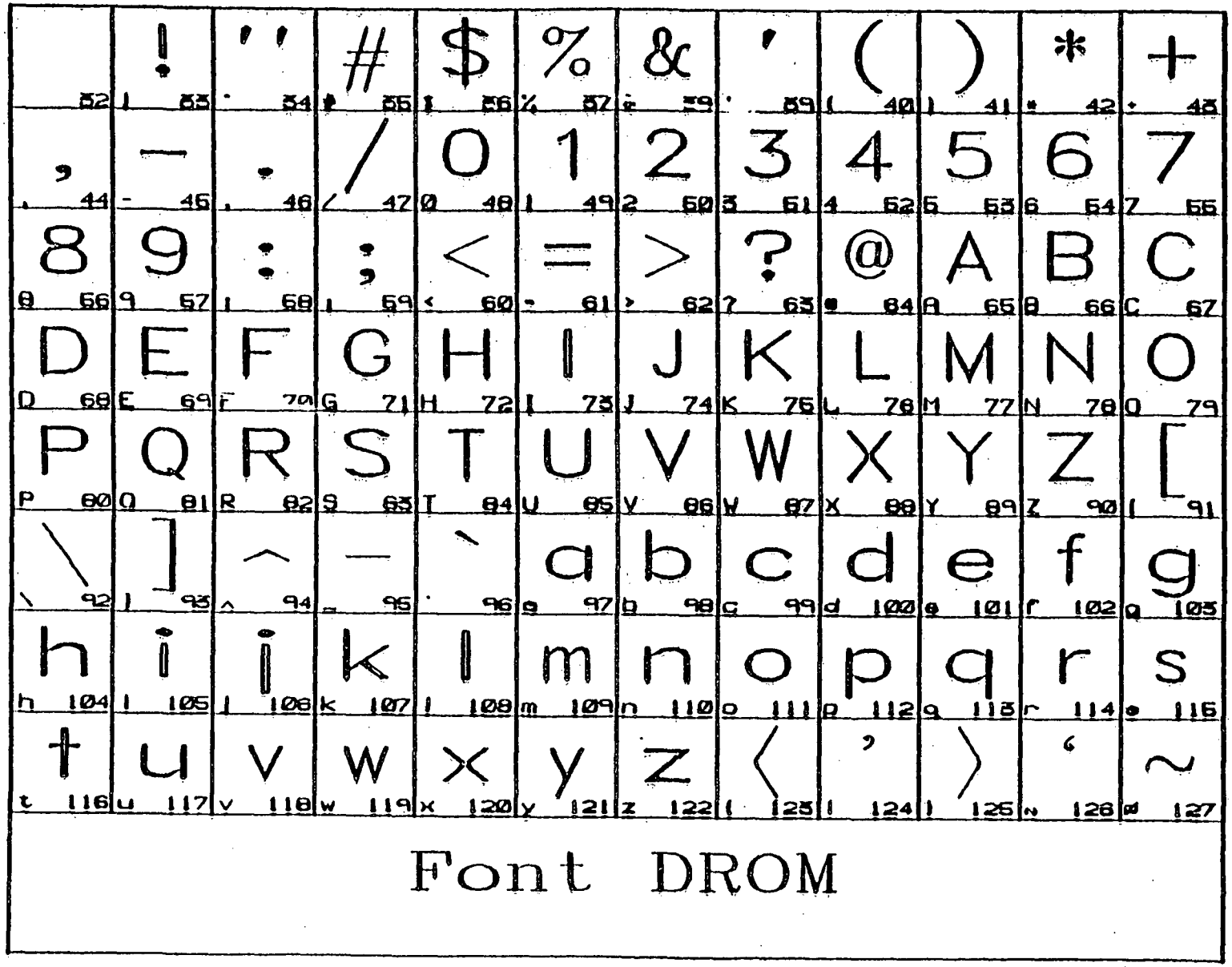

52
! 53
" 54
55
Ы 56
Ц 57
ы 58
' 59
(40
) 41
* 42
+ 43
, 44
— 45
. 46
/ 47
О 48
1 49
2 50
3 51
4 52
5 53
6 54
7 55
8 56
9 57
: 58
; 59
< 60
= 61
> 62
? 63
@ 64
А 65
Б 66
Э 67
Д 68
Й 69
Ф 70
Г 71
Ж 72
И 73
Ч 74
К 75
Л 76
М 77
Н 78
О 79
П 80
Ш 81
Р 82
С 83
Т 84
Ю 85
В 86
Щ 87
Х 88
У 89
З 90
Е 91
\ 92
Ъ 93
Я 94
Ь 95
Ц 96
а 97
б 98
э 99
д 100
й 101
ф 102
г 103
ж 104
и 105
ч 106
к 107
л 108
м 109
н 110
о 111
п 112
ш 113
р 114
с 115
т 116
ю 117
в 118
щ 119
х 120
у 121
з 122
е 123
ъ 124
я 125
ь 126
ъ 128
ъ 127
Font CCYR

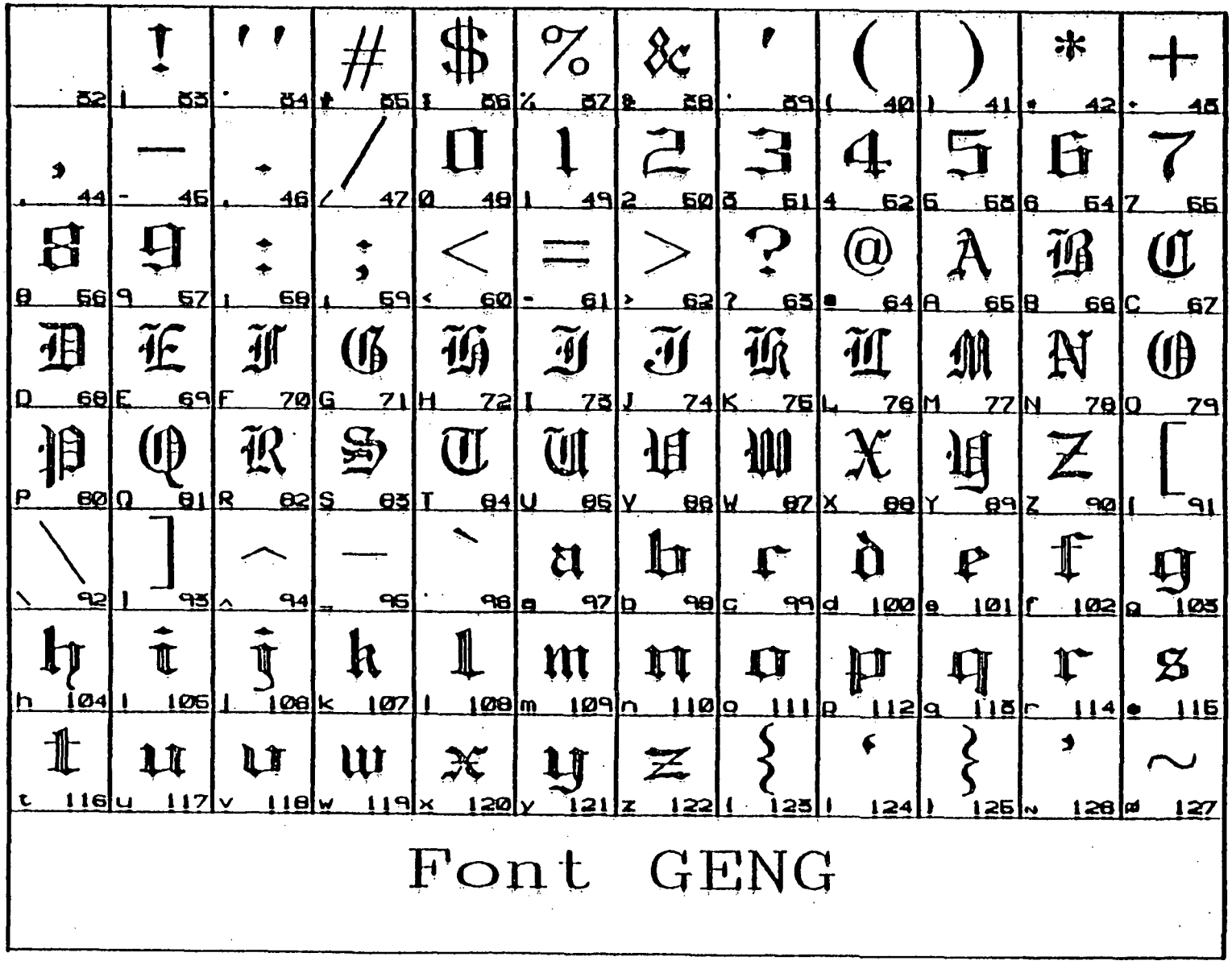

32
! 33
" 34
35
$ 36
% 37
& 38
' 39
(40
) 41
* 42
+ 43
, 44
— 45
. 46
/ 47
0 48
1 49
2 50
3 51
4 52
5 53
6 54
7 55
8 56
9 57
: 58
; 59
< 60
= 61
> 62
? 63
@ 64
A 65
B 66
C 67
Δ 68
E 69
Φ 70
Γ 71
H 72
I 73
J 74
K 75
Λ 76
M 77
N 78
O 79
Π 80
Θ 81
P 82
Σ 83
T 84
Υ 85
° 86
Ω 87
Ξ 88
Ψ 89
Z 90
[91
\ 92
] 93
^ 94
_ 95
` 96
α 97
β 98
χ 99
δ 100
ε 101
φ 102
γ 103
η 104
ι 105
× 106
κ 107
λ 108
μ 109
ν 110
ο 111
π 112
ϑ 113
ρ 114
σ 115
τ 116
υ 117
÷ 118
ω 119
ξ 120
ψ 121
ζ 122
{ 123
| 124
} 125
~ 126
Font CGRE

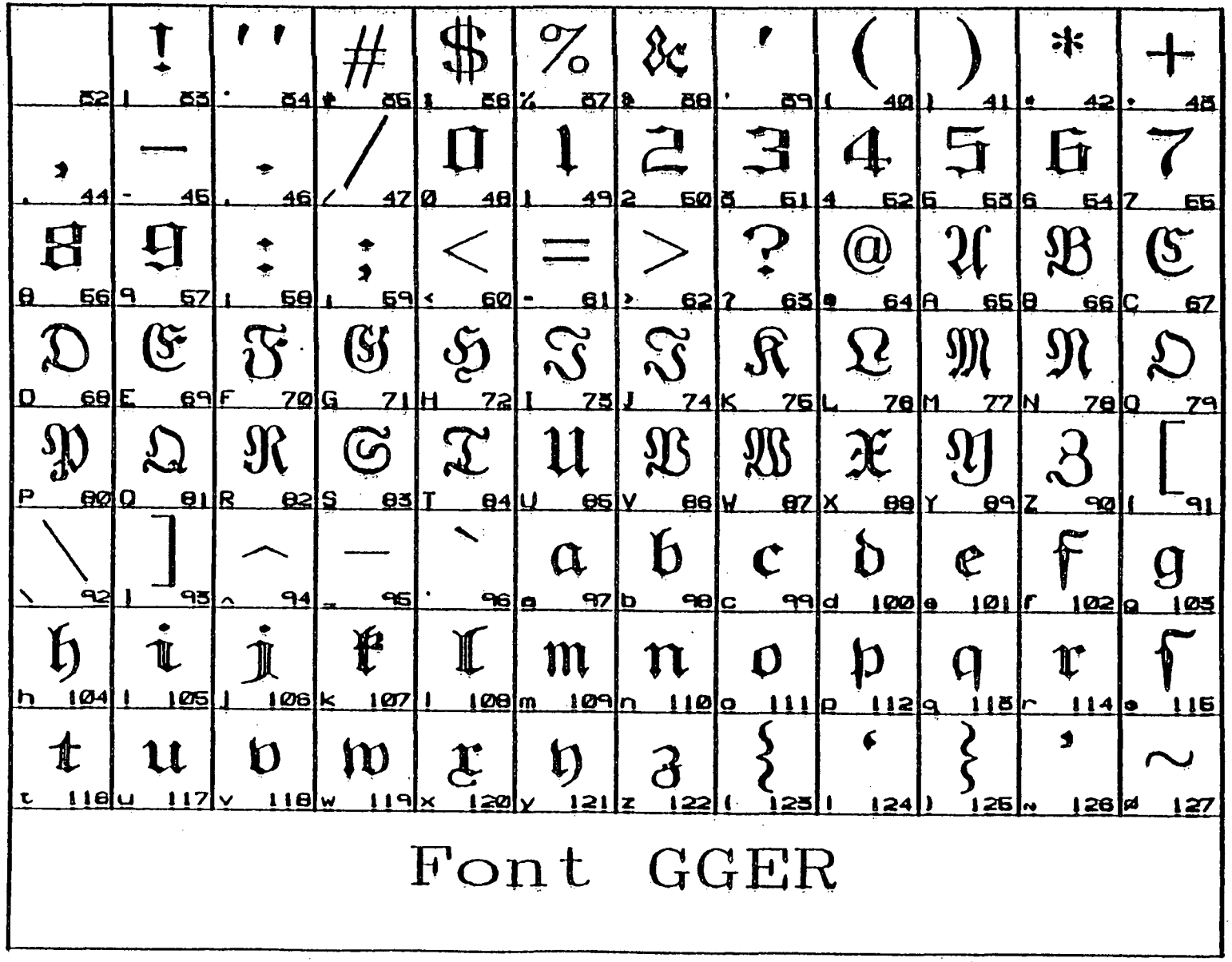

Font CITA

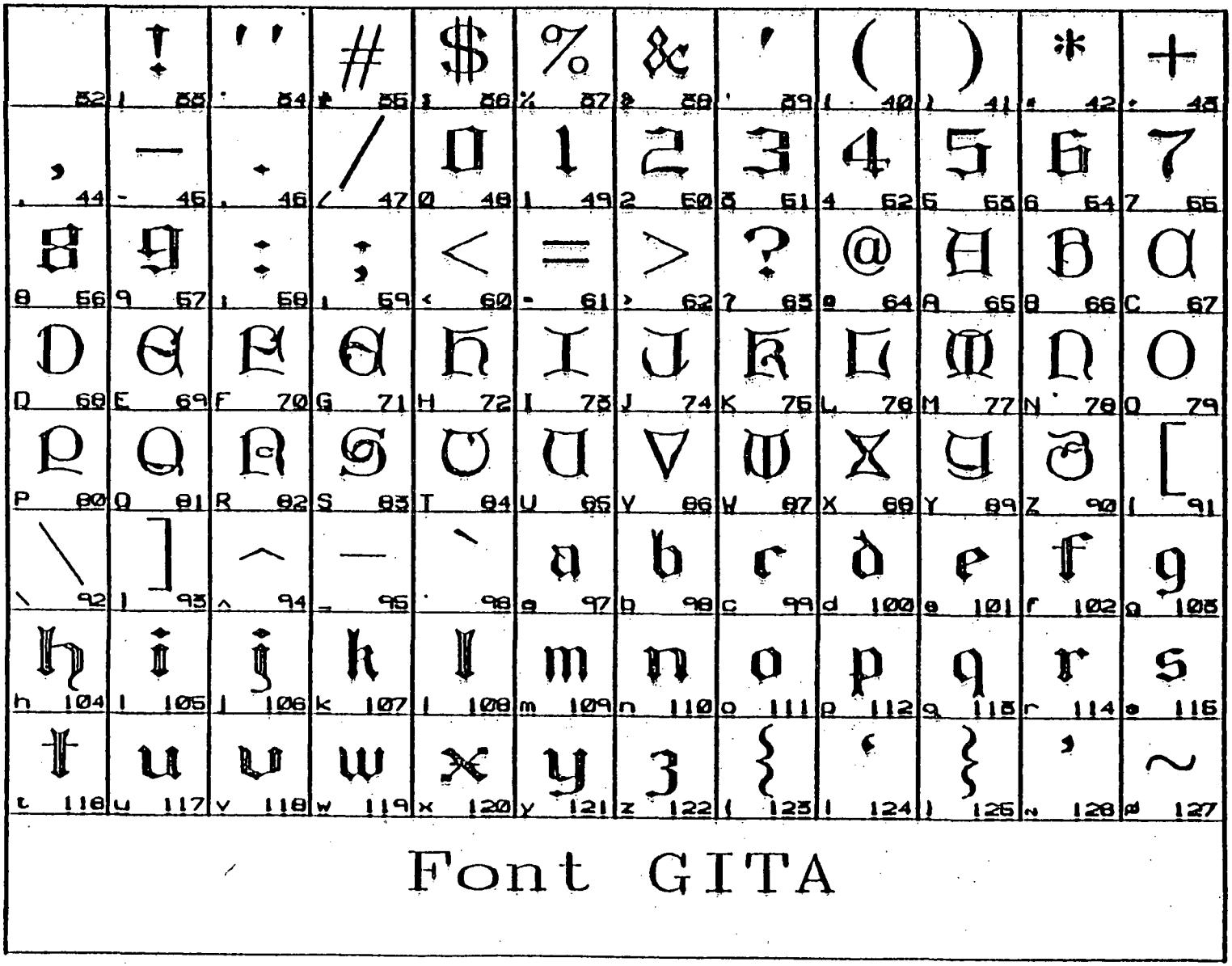

! " # $ % & ' ( ) * +
, - . / 0 1 2 3 4 5 6 7
8 9 : ; < = > ? @ A B C
D E F G H I J K L M N O
P Q R S T U V W X Y Z [
\ ] ^ _ ` a b c d e f g
h i j k l m n o p q r s
t u v w x y z { | } ~
Font CROM

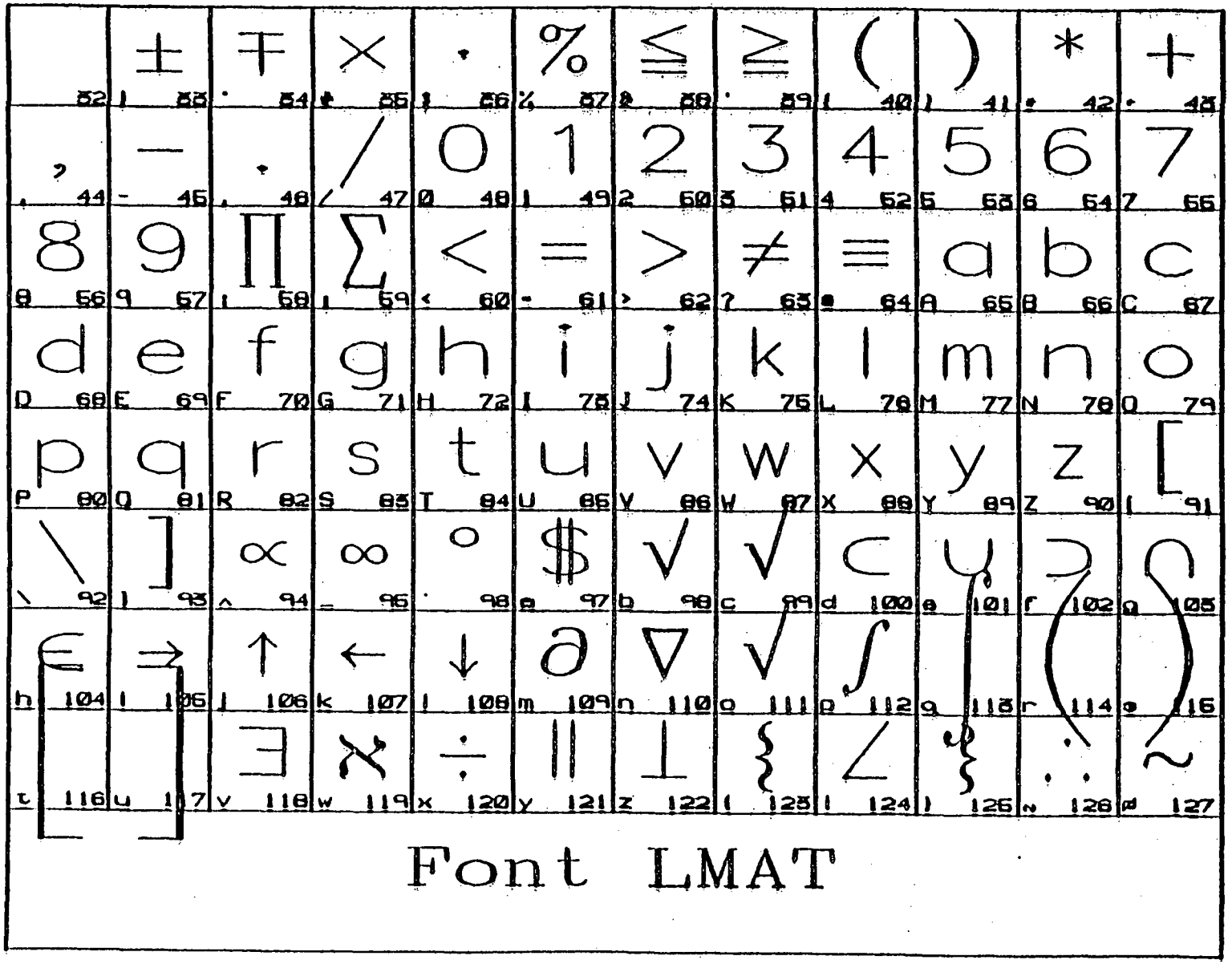

Font CSCR

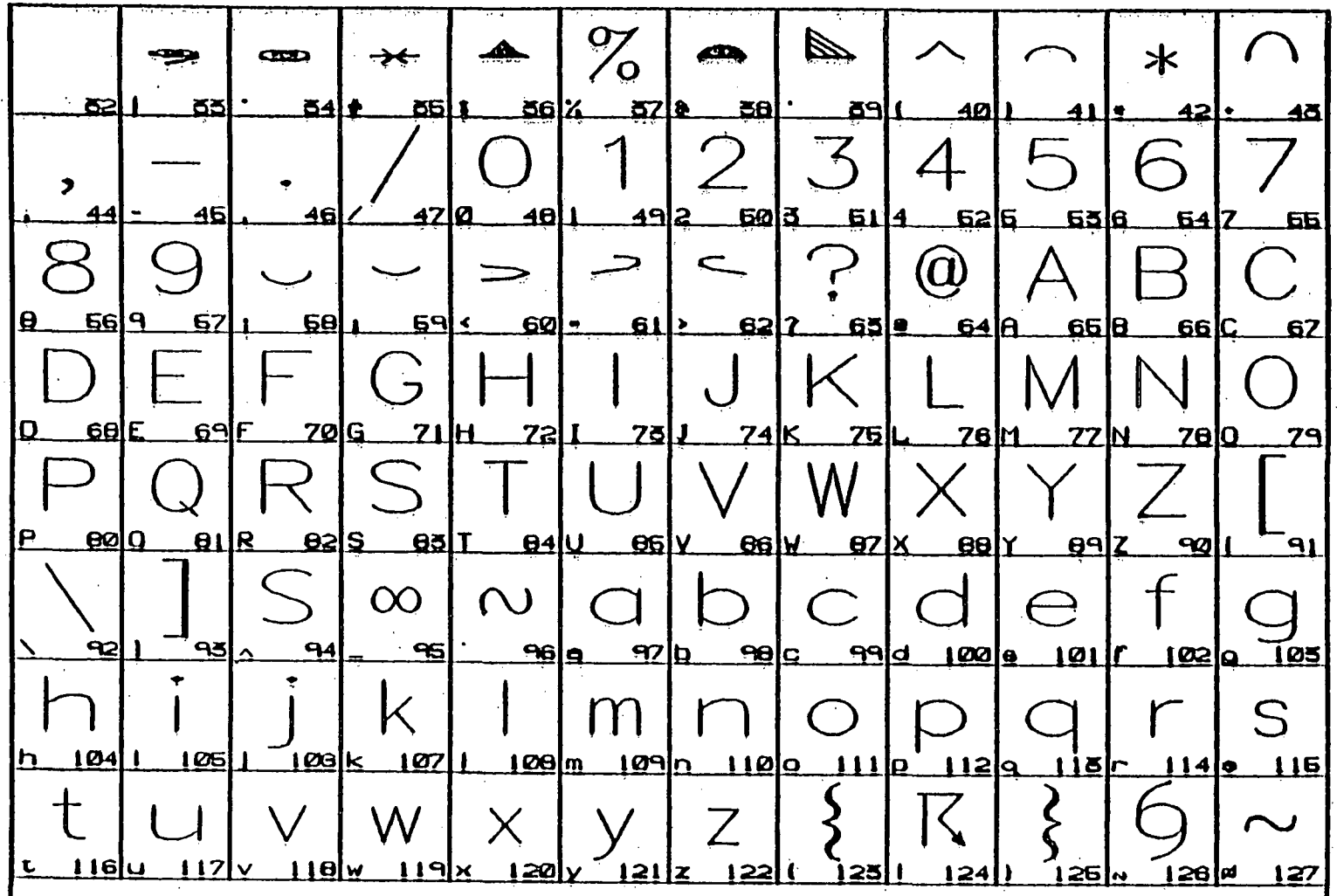

Font DROM

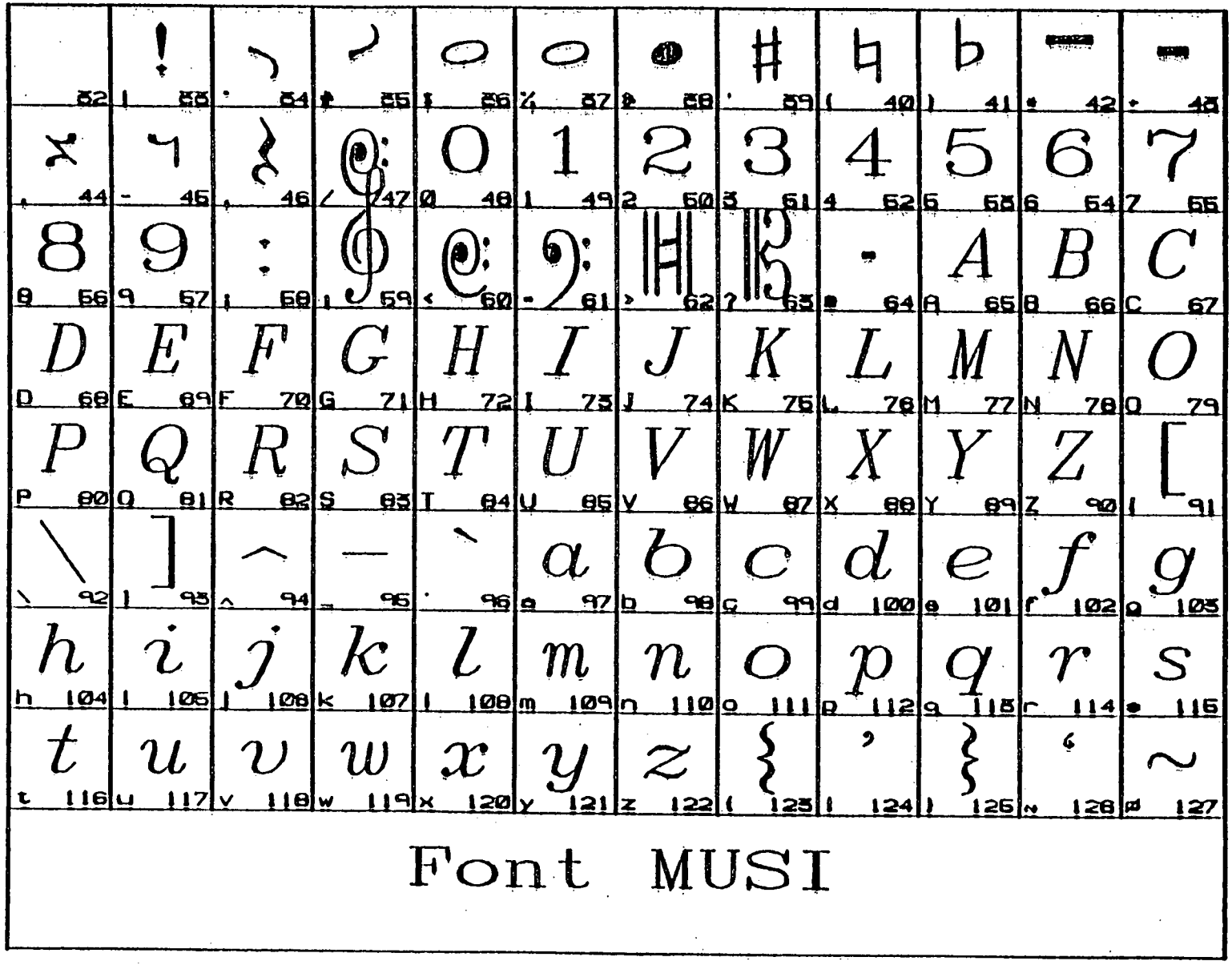

Font GENG

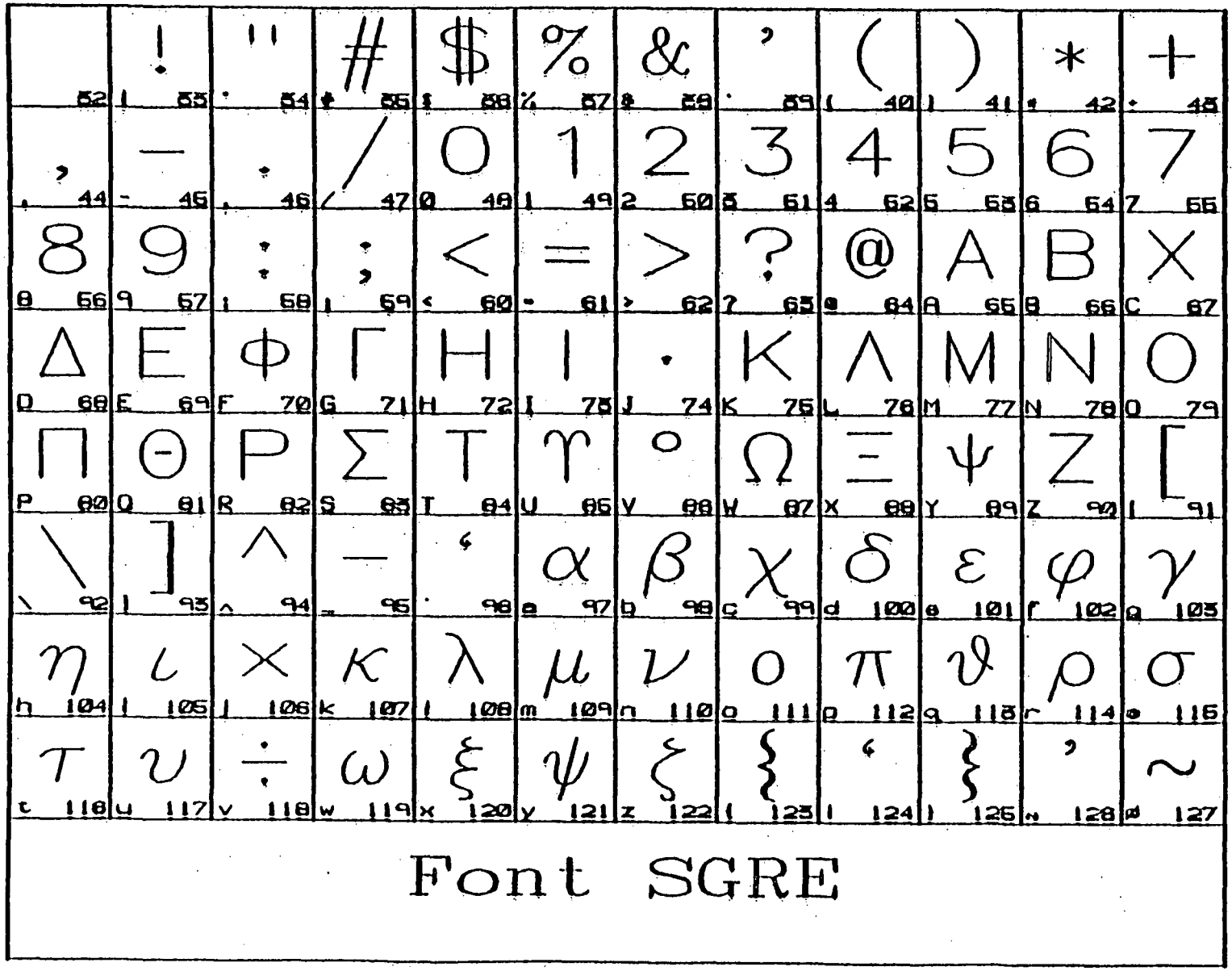

Font GGER

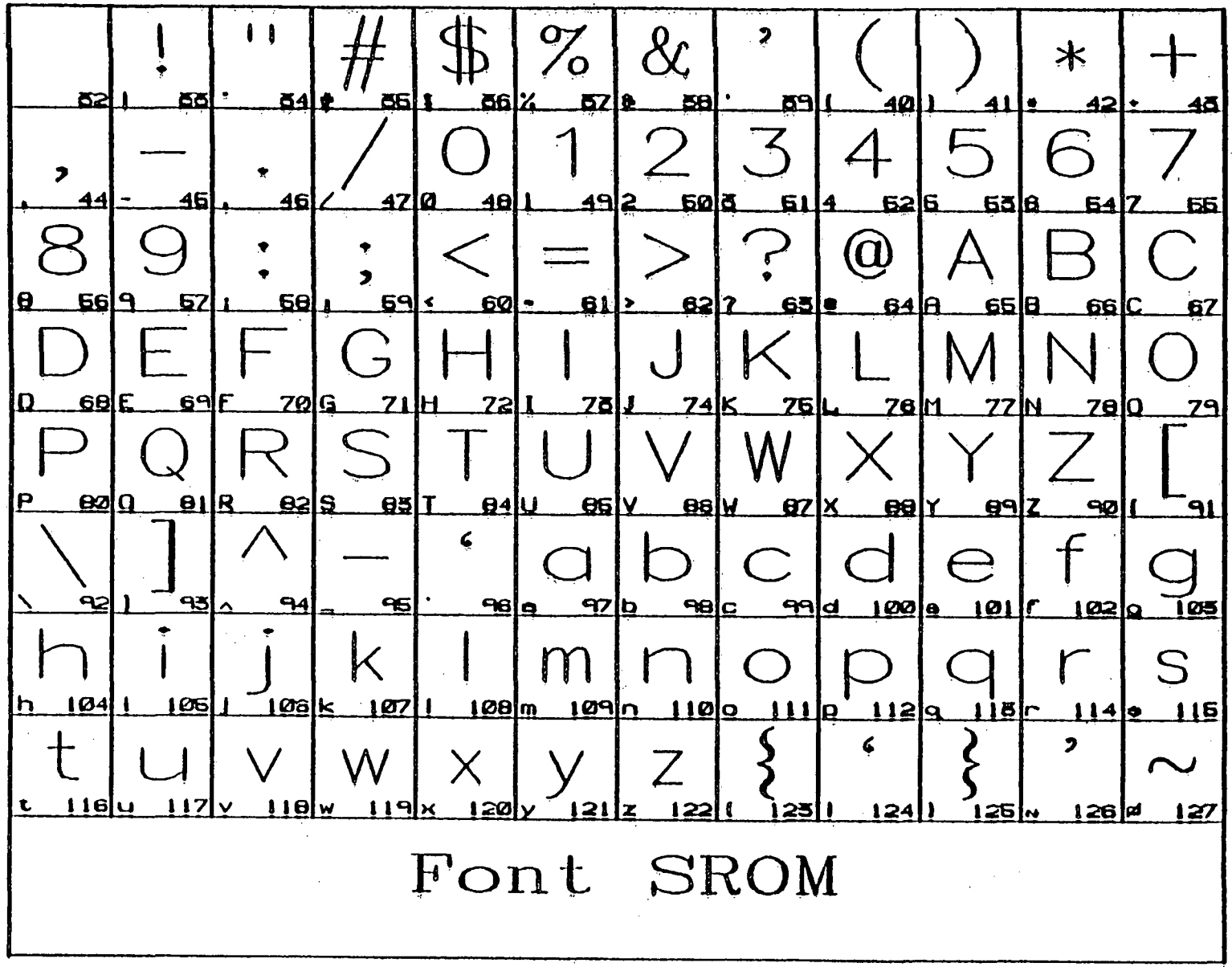

Font GITA

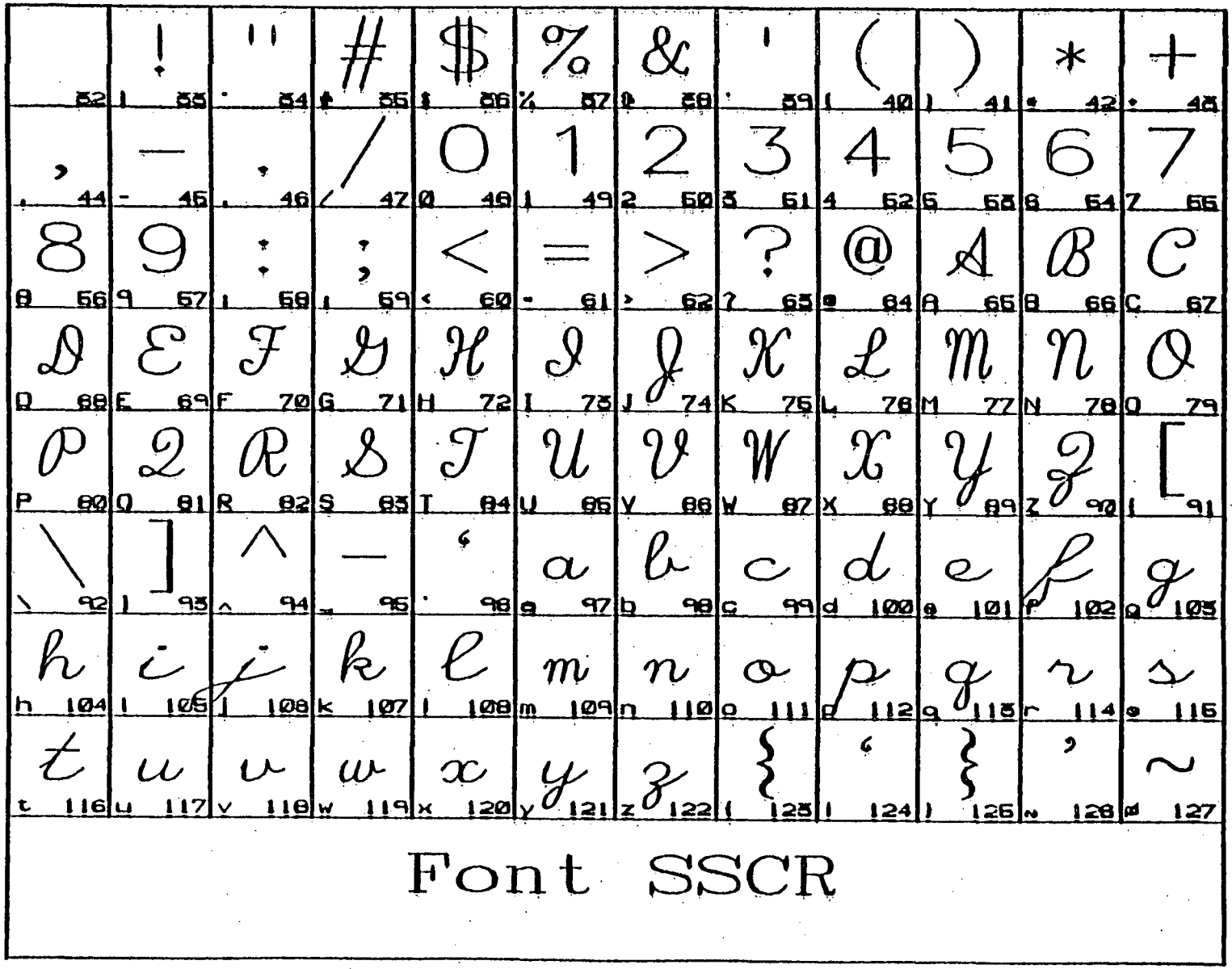

Font LMAT

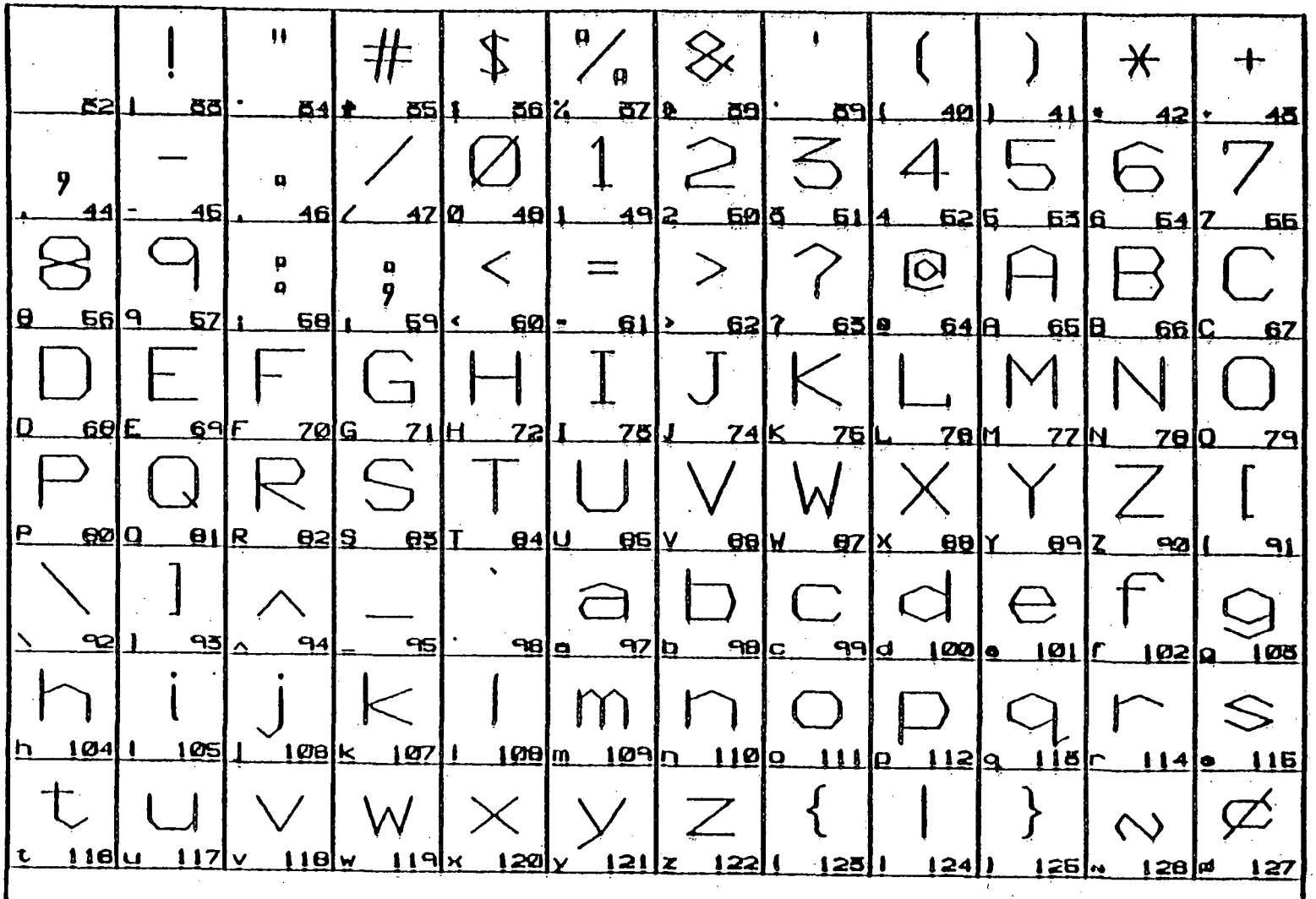

32
33 !
34 "
35 #
36 $
37 %
38 &
39 '
40 (
41)
42 *
43 +
44 ,
45 -
46 .
47 /
48 0
49 1
50 2
51 3
52 4
53 5
54 6
55 7
56 8
57 9
58 :
59 ;
60 <
61 =
62 >
63 ?
64 @
65 A
66 B
67 C
68 D
69 E
70 F
71 G
72 H
73 I
74 J
75 K
76 L
77 M
78 N
79 O
80 P
81 Q
82 R
83 S
84 T
85 U
86 V
87 W
88 X
89 Y
90 Z
91 [
92 \
93]
94 ^
95 _
96 `
97 a
98 b
99 c
100 d
101 e
102 f
103 g
104 h
105 i
106 j
107 k
108 l
109 m
110 n
111 o
112 p
113 q
114 r
115 s
116 t
117 u
118 v
119 w
120 x
121 y
122 z
123 {
124 |
125 }
126 ~
127
Font METE

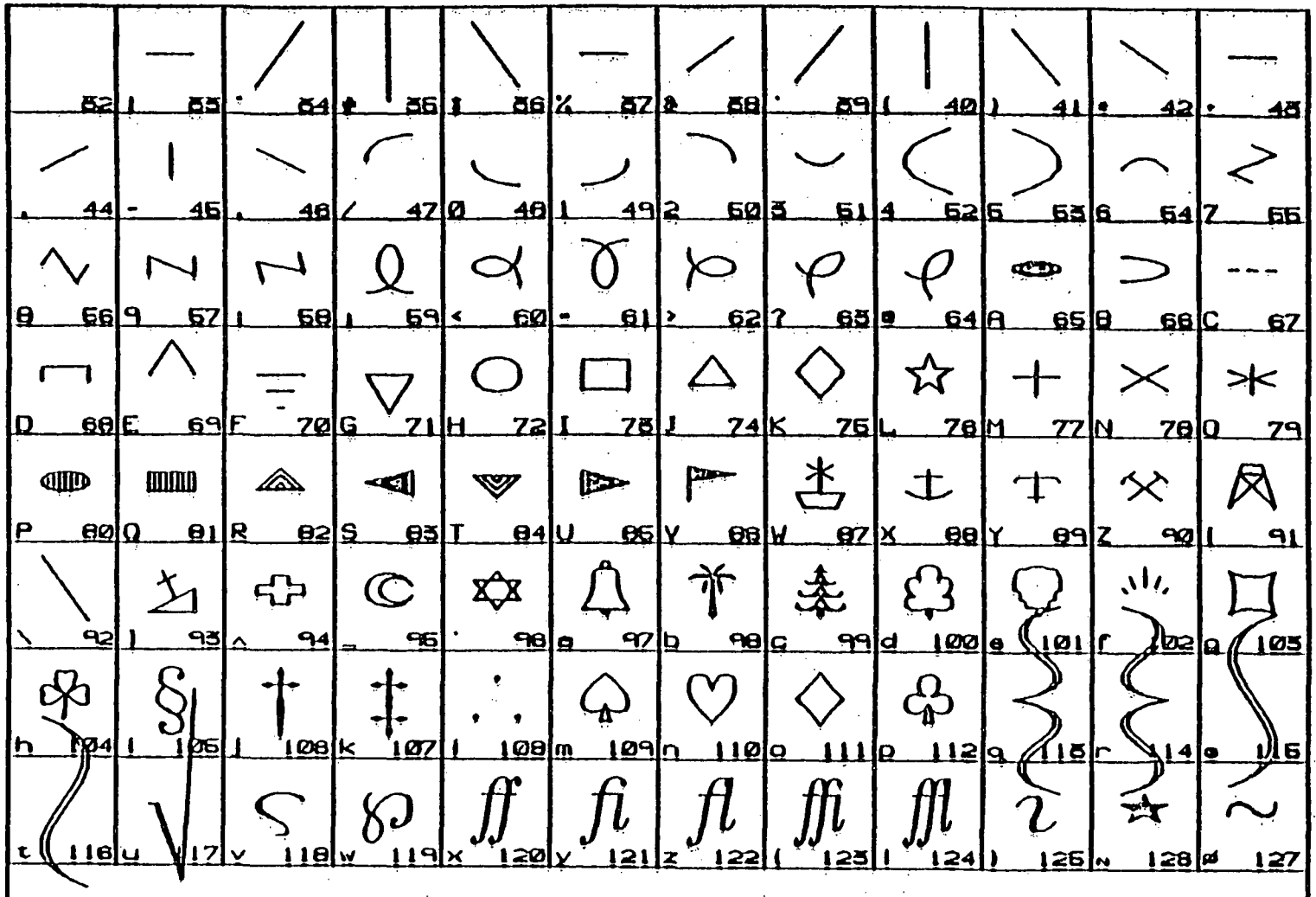

Font MUSI

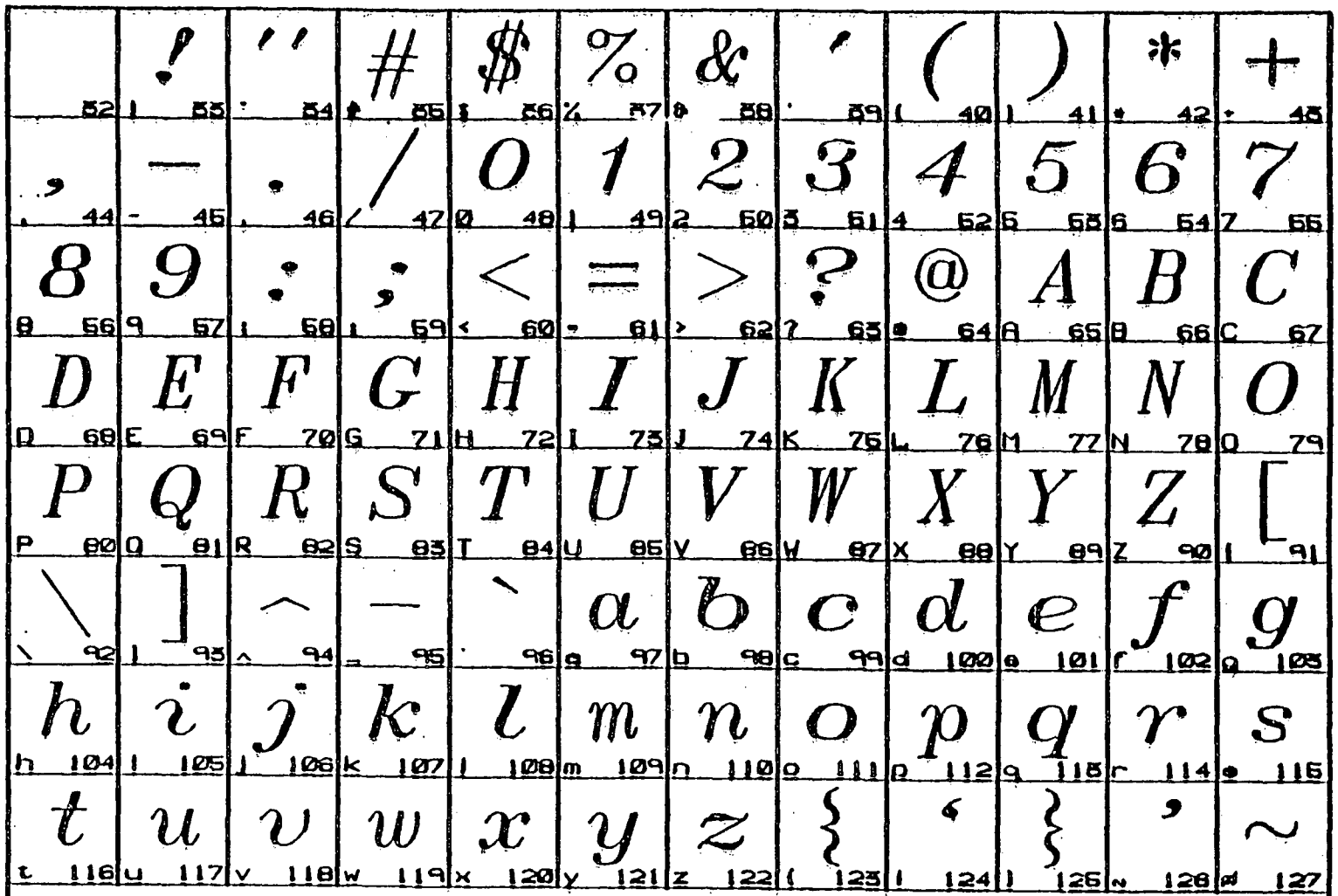

Font SGRE


Font SROM

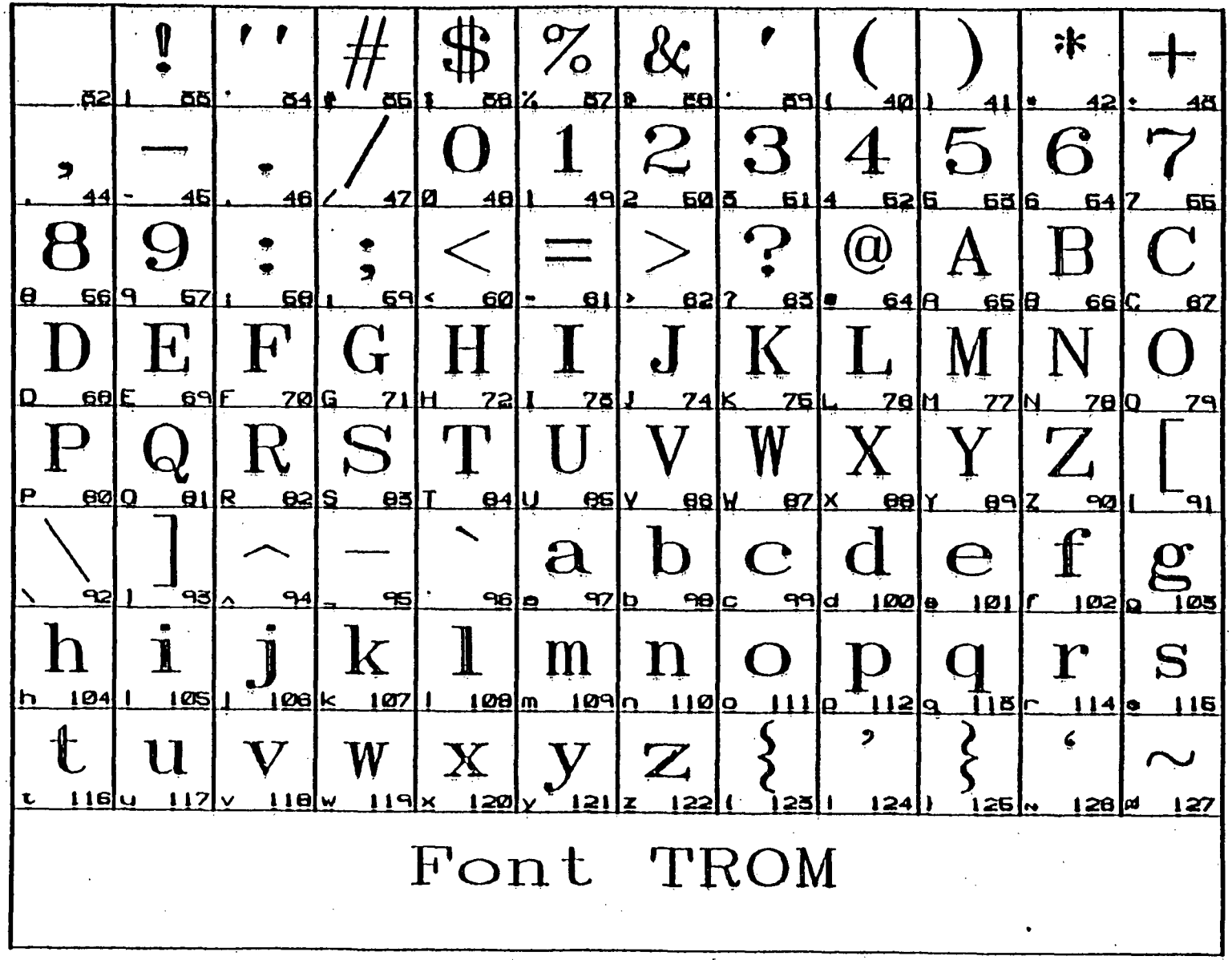

Font SSCR

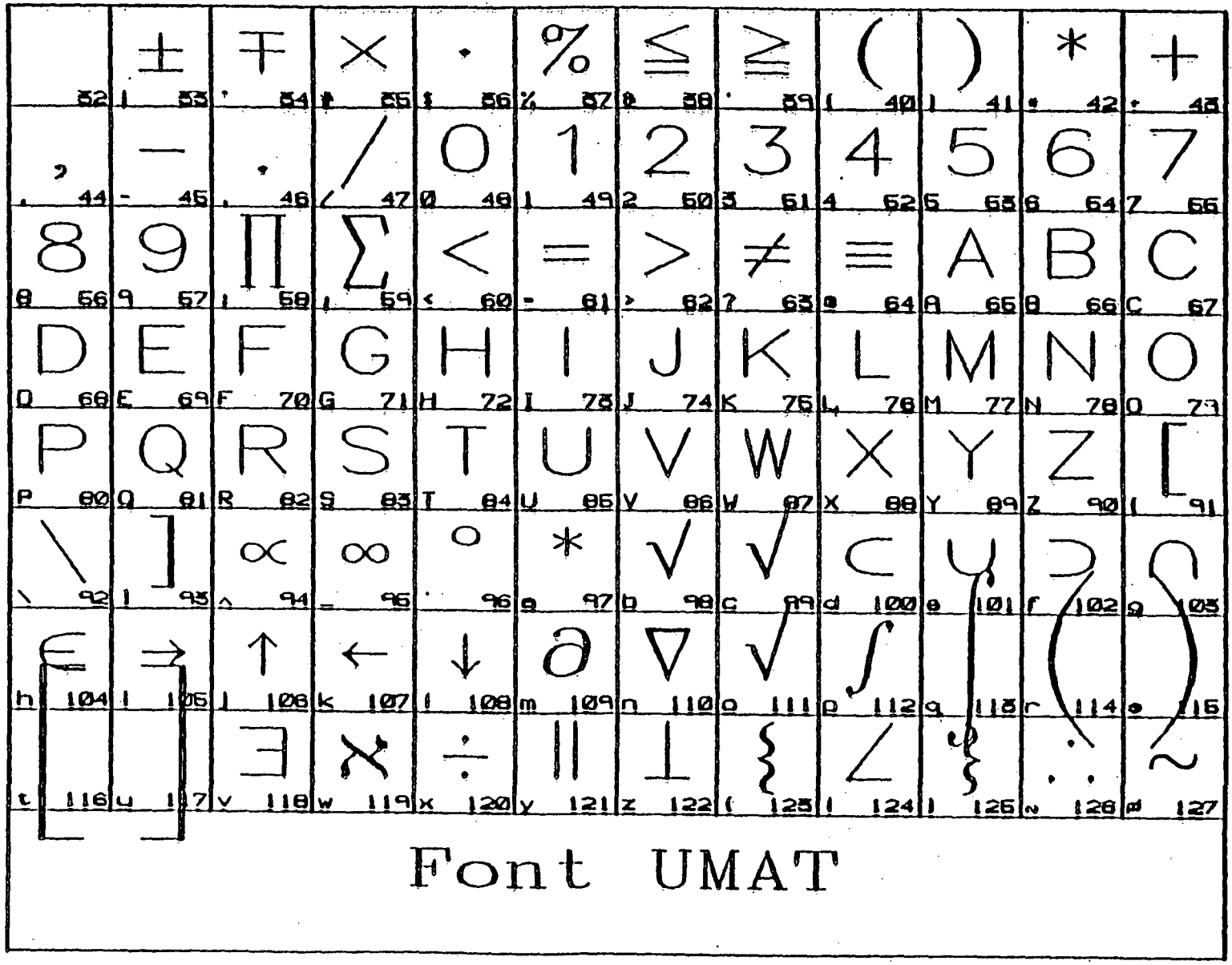

Font STPL


32 ! 33 " 34 # 35 $ 36 % 37 & 38 ' 39 (40) 41 * 42 + 43
, 44 - 45 . 46 / 47 0 48 1 49 2 50 3 51 4 52 5 53 6 54 7 55
8 56 9 57 : 58 ; 59 < 60 = 61 > 62 ? 63 @ 64 A 65 B 66 C 67
D 68 E 69 F 70 G 71 H 72 I 73 J 74 K 75 L 76 M 77 N 78 O 79
P 80 Q 81 R 82 S 83 T 84 U 85 Y 88 W 87 X 88 Y 89 Z 90 [91
\ 92] 93 ^ 94 _ 96 ` 98 a 97 b 98 c 99 d 100 e 101 f 102 g 105
h 104 i 106 j 108 k 107 l 108 m 109 n 110 o 111 p 112 q 115 r 114 s 116
t 116 u 117 v 118 w 119 x 120 y 121 z 122 { 123 | 124 } 126 ~ 128 ø 127
Font SYMB



Font TITA


Font TROM


Font UMAT

Appendix D — Sample TEXT Output

Sample TEXT Output

This appendix illustrates the various font styles for the sample TEXT input file of Figure 2-3. The displays have been reduced slightly for inclusion in this document. In all cases, an UNderLINed title of ONE line, a MEDIUM border, and SINGLE spacing were specified; only the font selection was varied. In addition, the size required for the generation of the output is shown beneath the display.

SYSTEM OVERVIEW

The PCDS consists of five subsystems: CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. A brief description of each of the five subsystems of the PCDS is provided below.

The CATALOG Subsystem provides a user with comprehensive descriptions of a number of climate parameter data sets and the associated sensor measurements from which the climate parameters were derived. These descriptions include the temporal and spatial extents of the data sets together with the experiments' data products. The catalog information is maintained at two levels: summary and detailed. Summary information is stored in a data base managed by a commercial data base management system, ORACLE. The user may obtain a list of summary information about the data sets by specifying keywords to limit the information listed. Detailed descriptive information is maintained in text files which the user may browse as one would a book, using tables of contents to locate information of interest. The information is displayed at the user's terminal in a paged format.

The INVENTORY Subsystem provides detailed information about the temporal coverage and data volume of data sets which are readily accessible through either the PCDS or other applications stored in the ORACLE data base. The inventory performs two important functions. First, it allows a user to scan the total data holdings and determine whether data for a given time period are accessible. Second, it enables the DATA ACCESS Subsystem (described below) to automatically locate data meeting such user specifications as time range and parameters.

The DATA ACCESS Subsystem allows the user to access automatically the PCDS data sets using criteria such as time range and geographic location. Output from this subsystem includes user disk files or tape files in the same format as the original data, or files in a special data-independent format which allows them to be input to other subsystems of the PCDS. These special files are called Climate Data Files (CDFs). Users may also obtain listings of the data. The data sets generated by the copy operation can be subsequently listed, copied or subsetted.

The DATA MANIPULATION Subsystem allows the user to access and manipulate the data-independent files created via DATA ACCESS or by application programs written by users, possibly on another machine. Therefore, this subsystem is not limited only to data sets the PCDS directly supports. This subsystem includes programs which allow users to obtain a listing of a CDF's contents, subset a CDF, or split a gridded data set apart into its components (latitude, longitude, value). The output of any of these may be input to any other DATA MANIPULATION program or the programs in the GRAPHICS Subsystem.

The GRAPHICS Subsystem provides the user with the tools to create various graphical representations of the data stored in CDFs. Users may generate such graphical displays as histograms, 'x-y' plots, contour plots, and surface diagrams. Many options exist to tailor the output for a specific need. Various color and monochromatic display devices (e.g., terminals and plotters) are supported. Publication/presentation quality output is also available.

Simple Characters (STPL) Font — 467 VAX Blocks Required

SYSTEM OVERVIEW

The PCDS consists of five subsystems: CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. A brief description of each of the five subsystems of the PCDS is provided below.

The CATALOG Subsystem provides a user with comprehensive descriptions of a number of climate parameter data sets and the associated sensor measurements from which the climate parameters were derived. These descriptions include the temporal and spatial extents of the data sets together with the experiments' data products. The catalog information is maintained at two levels: summary and detailed. Summary information is stored in a data base managed by a commercial data base management system, ORACLE. The user may obtain a list of summary information about the data sets by specifying keywords to limit the information listed. Detailed descriptive information is maintained in text files which the user may browse as one would a book, using tables of contents to locate information of interest. The information is displayed at the user's terminal in a paged format.

The INVENTORY Subsystem provides detailed information about the temporal coverage and data volume of data sets which are readily accessible through either the PCDS or other applications stored in the ORACLE data base. The inventory performs two important functions. First, it allows a user to scan the total data holdings and determine whether data for a given time period are accessible. Second, it enables the DATA ACCESS Subsystem (described below) to automatically locate data meeting such user specifications as time range and parameters.

The DATA ACCESS Subsystem allows the user to access automatically the PCDS data sets using criteria such as time range and geographic location. Output from this subsystem includes user disk files or tape files in the same format as the original data, or files in a special data-independent format which allows them to be input to other subsystems of the PCDS. These special files are called Climate Data Files (CDFs). Users may also obtain listings of the data. The data sets generated by the copy operation can be subsequently listed, copied or subsetted.

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The GRAPHICS Subsystem provides the user with the tools to create various graphical representations of the data stored in CDFs. Users may generate such graphical displays as histograms, "x-y" plots, contour plots, and surface diagrams. Many options exist to tailor the output for a specific need. Various color and monochromatic display devices (e.g., terminals and plotters) are supported. Publication/presentation quality output is also available.

Simplex Roman (SROM) Font — 870 VAX Blocks Required

SYSTEM OVERVIEW

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Complex Roman (CROM) Font — 1647 VAX Blocks Required

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Complex Italic (CITA) Font — 1961 VAX Blocks Required

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Triplex Italic (TITA) Font — 2500 VAX Blocks Required

SYSTEM OVERVIEW

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Simplex Script (SSCR) Font — 1444 VAX Blocks Required

SYSTEM OVERVIEW

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Complex Script (CSCR) Font — 1749 VAX Blocks Required

SYSTEM OVERVIEW

The PCIS consists of five subsystems: CATALOG, INVENTORY, DATA ACCESS, DATA MANIPULATION, and GRAPHICS. A brief description of each of the five subsystems of the PCIS is provided below.

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The INVENTORY Subsystem provides detailed information about the temporal coverage and data volume of data sets which are readily accessible through either the PCIS or other applications stored in the ORACLE data base. The inventory performs two important functions. First, it allows a user to scan the total data holdings and determine whether data for a given time period are accessible. Second, it enables the DATA ACCESS Subsystem (described below) to automatically locate data meeting such user specifications as time range and parameters.

The DATA ACCESS Subsystem allows the user to access automatically the PCIS data sets using criteria such as time range and geographic location. Output from this subsystem includes user disk files or tape files in the same format as the original data, or files in a special data-independent format which allows them to be input to other subsystems of the PCIS. These special files are called Climate Data Files (CDFs). Users may also obtain listings of the data. The data sets generated by the copy operation can be subsequently listed, copied or subsetted.

The DATA MANIPULATION Subsystem allows the user to access and manipulate the data-independent files created via DATA ACCESS or by application programs written by users, possibly on another machine. Therefore, this subsystem is not limited only to data sets the PCIS directly supports. This subsystem includes programs which allow users to obtain a listing of a CDF's contents, subset a CDF, or split a gridded data set apart into its components (latitude, longitude, value). The output of any of these may be input to any other DATA MANIPULATION program or the programs in the GRAPHICS Subsystem.

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1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
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Carey E. Noll	

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16. Abstract

This document provides information and instruction on the use of the Pilot Climate Data System (PCDS) Charts Subsystem. This facility is an interactive software system for the graphical production and enhancement of text and viewgraph displays.

17. Key Words (Selected by Author(s))	18. Distribution Statement
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