

Professional Graphics Series

IBM RT PC Graphics Terminal Emulator User's Guide

Programming Family



Personal
Computer
Software

59X8568

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IBM RT Personal Computer Graphics Terminal Emulator Licensed Program (55X8923)

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Statement of Function Warranted

The IBM RT Personal Computer Graphics Terminal Emulator Licensed Program (55X8923) enables the IBM RT PC to emulate subsets of the Tektronix² 4010 and 4100 protocols, and a subset of the Lear Siegler ADM-3A³ protocol⁴.

The highlights of this licensed program are:

- Permits use of existing graphics applications supporting the following terminal protocols:
 - Tektronix 4010 and 4012 protocols, and most functions of the Tektronix 4014 protocol
 - A selected subset of the Tektronix 4105 protocol
 - Most functions of the Lear Siegler ADM-3A protocol.
- Provides an icon-driven user interface
- Supports several compatible modes:

¹ RT, RT PC, and RT Personal Computer are trademarks of IBM

² Trademark of Tektronix, Inc.

³ ADM is a trademark of Lear Siegler, Inc.

⁴ The protocols supported are the most current available from Tektronix, Inc., and Lear Siegler, Inc., as of October 1985. For details concerning support of the subsets, contact your IBM marketing representative or authorized IBM dealer.

- ALPHA mode
- VECTOR mode
- Graphics input mode.
- Allows output to the following:
 - Displays, printers and plotters supported by the IBM RT PC Graphics Development Toolkit Licensed Program (55X8921)
 - Disk files in the Virtual Device Metafile (VDM) format supported by the IBM RT PC Graphical File System Licensed Program (55X8927).
- Allows uploading and downloading of files to host systems supporting ASCII protocol
- Permits a variety of user-definable asynchronous host communication protocols
- Executes local IBM RT PC AIX⁵ Operating System commands without leaving emulator mode.

Specified Operating Environment

Machine Requirements

The minimum machine requirements are:

- An IBM RT PC with an asynchronous adapter and one of the following displays: the IBM RT PC Advanced Color Graphics Display, IBM RT PC Advanced Monochrome Graphics Display, or an equivalent display.

Note: The number of users on the IBM RT PC AIX Operating System Licensed Program, Version 1.1, (74X9995), the number and type of tasks, and the application requirements may expand the requirements beyond these minimums.

Programming Requirements

The IBM RT PC AIX Operating System Licensed Program, Version 1.1, (74X9995) is a prerequisite for program execution.

Statement of Service

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Professional Graphics Series

IBM RT PC Graphics Terminal Emulator User's Guide

Programming Family



**Personal
Computer
Software**

First Edition (July 1986)

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About This Book

This book explains how to install and use the IBM RT Personal Computer Graphics Terminal Emulator. Graphics Terminal Emulator enables the IBM RT PC to emulate the Tektronix¹ 4010 and 4012 graphics terminals, most functions of the Tektronix 4014 with the Extended Graphics Module, and selected features of the Tektronix 4105. Most functions of the Lear Siegler ADM²-3A are also supported.

Who Should Read This Book

The IBM RT PC Graphics Terminal Emulator is designed for use by technical and scientific professionals who have experience on Tektronix or ADM-3A terminals. You should also have some experience with the IBM RT PC AIX³ Operating System. You need no programming experience.

¹ Tektronix is a trademark of Tektronix, Inc.

² ADM is a trademark of Lear Siegler, Inc.

³ AIX is a trademark of IBM.

Before You Begin

Before you begin using Graphics Terminal Emulator, ensure that you have the minimum requirements for both hardware and software.

Hardware Requirements

The minimum hardware required to use Graphics Terminal Emulator is:

- A graphics display device supported by the IBM RT PC Graphics Development Toolkit
- An asynchronous adapter such as the RS-232 Asynchronous Multiport Adapter.

See the *IBM RT PC User Setup Guide* for a description of the supported adapters.

Software Requirements

To use the Graphics Terminal Emulator, you must have the IBM RT PC Graphics Development Toolkit device drivers installed on your system. These device drivers are provided as part of the IBM RT PC Multi-User programs. The description of the device drivers is contained in *IBM RT PC Graphics Development Toolkit*, Appendix C, “Graphics Drivers.”

How To Use This Book

The first chapter is a general overview of Graphics Terminal Emulator as a whole. Chapters 2 and 4 describe the features of the product in more detail, while Chapter 3 describes how to use a host computer to upload and download files between your computer and a host computer.

Organization

This book is divided into four chapters, six appendixes, two glossaries and an index as follows:

- **Chapter 1**, “Overview”, introduces screens, menus, icons, areas, and cursors.
- **Chapter 2**, “Using Graphics Terminal Emulator”, describes the steps necessary to establish communications with a host computer.
- **Chapter 3**, “Transferring Files and Accessing the IBM AIX Operating System”, explains the procedures for uploading and downloading files.
- **Chapter 4**, “Screens and Screen Options”, covers the various screens and describes their primary function icons, subfunction icons, and menus.
- **Appendix A**, “Installing Graphics Terminal Emulator”, outlines the basic procedures for starting up the Graphics Terminal Emulator, setting the environment, installing your programs, and verifying that the system is operational.
- **Appendix B**, “Error Messages and Codes”, explains the error messages you might encounter while using Graphics Terminal Emulator.
- **Appendix C**, “Sample Graphics Terminal Emulator Sessions”, provides sample terminal sessions that illustrate some of the applications of Graphics Terminal Emulator.
- **Appendix D**, “Function Key Assignments and Default Values”, lists special-purpose function keys available in Graphics Terminal Emulator, as well as default values used for switch settings and communications protocol.
- **Appendix E**, “Expanded Emulation Functions”, lists ADM-3A commands and Tektronix graphics functions.
- **Appendix F**, “ASCII Character and Control Codes”, is a listing of ASCII codes.
- The **Glossary** defines many of the technical terms that appear in Graphics Terminal Emulator.

-
- The **Icon Glossary** illustrates and describes the icons used in Graphics Terminal Emulator.
 - The **Index** shows you where to find information about several of the topics discussed.

Highlighting

Throughout this manual, bold italics have been used to highlight the first occurrences of new terms. Computer output and user input are shown in monospace type and in color.

Related Information

The following books contain related information that you might find useful.

IBM RT PC Graphics Development Toolkit

This book provides an overview of the Graphics Development Toolkit operation including specific information about how to incorporate Toolkit routines into graphic application programs. Included with the Toolkit are language reference booklets that support C, BASIC, FORTRAN, and Pascal programming languages.

IBM RT PC Plotting System Programmer's Guide

This book provides information about installation procedures, plotting concepts, and the Plotting System routines. Included with the Plotting System guide are language reference booklets that support C, BASIC, FORTRAN, and Pascal programming languages.

IBM RT PC Graphical File System Programmer's/User's Guide

This book is a guide to the installation and use of the Graphical File System. It contains information about Metafile concepts and elements, interactive interpretation of metafiles and programming with the Graphical File System.

IBM RT PC Using and Managing the AIX Operating System

This manual contains information for using the AIX Operating System commands, working with the file system, developing shell procedures, and performing such system management tasks as creating and mounting file systems, backing up the system and repairing file system damage.

IBM RT PC AIX Operating System Commands Reference

This manual describes the AIX Operating System commands, including the following:

- The proper syntax for each command with the acceptable flags and arguments
- Examples showing proper usage of the commands.

IBM RT PC Messages Reference

This manual lists the errors you may see on your display, and shows how to respond to the messages.

IBM RT PC AIX Operating System Technical Reference

This manual gives details about the AIX Operating System, the file system, files, special files, miscellaneous files, and writing device drivers.

IBM RT PC Installing and Customizing the AIX Operating System

This guide explains how to install the programs contained in the IBM RT PC AIX Operating System Licensed Program Product, as well as how to install other licensed program products. This guide also explains how to customize the AIX Operating System.

IBM RT PC User Setup Guide

This guide contains information about identifying, unpacking, and connecting devices and testing the system setup.

Ordering Additional Copies of This Book

To order additional copies of this publication (without the program diskettes), use either of the following sources:

- To order from your IBM representative, use Order Number SV21-8061.
- To order from your IBM dealer, use Part Number 55X8924.

A binder is included with the order.

About the IBM RT PC Professional Graphics Series

The IBM RT PC Professional Graphics Series consists of several compatible programs and libraries that provide you with a comprehensive graphics package. Designed to run under the IBM RT PC AIX Operating System, the series provides programmers with a versatile way to create, modify, store, and output high-quality graphic images.

Using the series, you can develop custom graphics applications that meet the needs of the business, scientific, engineering, and research environments.

The Series Components

The IBM RT PC Professional Graphics series includes:

- IBM RT PC Graphics Development Toolkit
- IBM RT PC Plotting System
- IBM RT PC Graphical File System
- IBM RT PC Graphics Terminal Emulator.

The following pages briefly describe the series components. See the individual manuals for more information.

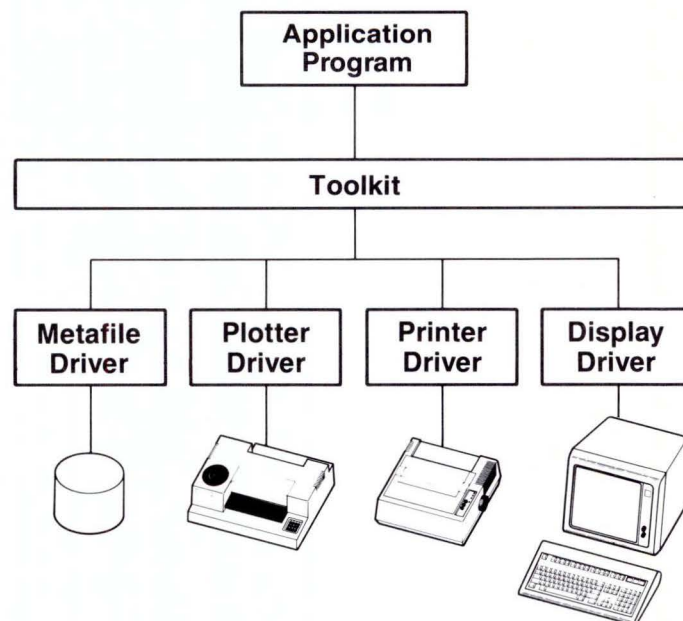
IBM RT PC Graphics Development Toolkit

At the heart of the Professional Graphics Series is the Graphics Development Toolkit, including its device drivers. These device drivers, part of the IBM RT PC Multi-User programs, must be installed in order to use any of the other graphics products in the series. The Toolkit controls the exchange of information (commands and data) between the high-level, device-independent applications and the device-dependent drivers. These drivers, in turn, control the operation of a variety of input and output devices, such as printers, plotters, and displays.

The Toolkit converts coordinates from a writing surface to the viewing surface coordinate systems of individual graphics devices. In addition, it manages all supported devices connected to the system and fulfills program requests for device information.

A library of language *bindings* (interfaces) is also contained in the Graphics Development Toolkit. Using this product, you can develop application programs that access the Toolkit directly. Language Reference Booklets for C, Pascal, FORTRAN 77, and BASIC are provided with the software.

The following illustration shows the interface between an application program and the Graphics Development Toolkit.



IBM RT PC Plotting System

Plotting System consists of subroutines that allow you to create professional-quality charts. The types of charts available include area, bar, line, pie, scatter, schedule, step and text-only charts.

Plotting System provides bindings to several major languages. The Toolkit, although transparent to the programmer, is the foundation of Plotting System.

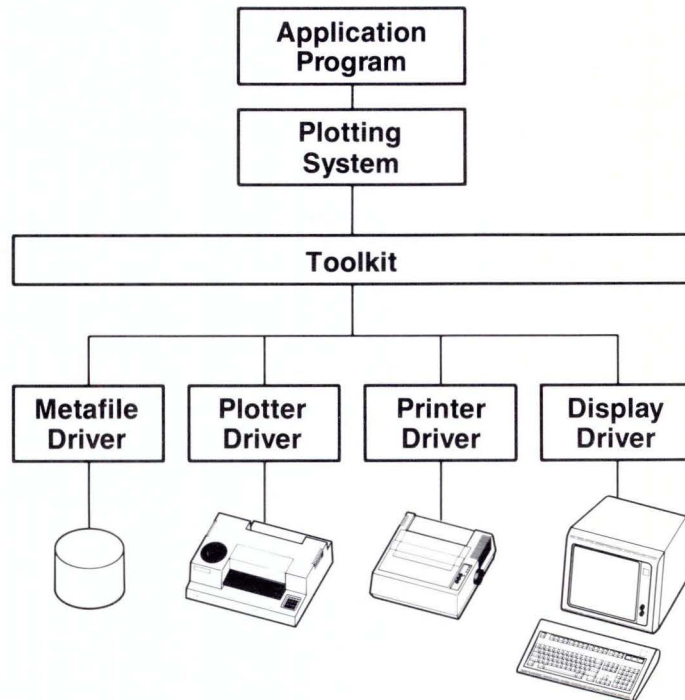
Because Plotting System provides a comprehensive set of default values, you can create charts with a minimum number of steps. A built-in chart dimensioning procedure ensures that the sizing and spacing of chart components are consistent and proportional. Multiple charts or chart types can appear on a single display surface.

Most chart attributes can be changed. These include:

- Line style for line and step charts
- Fill pattern for area, pie and bar charts
- Color
- Text height and font
- Logarithmic axes
- Axis range
- Tick-spacing.

Plotting System includes facilities for both graphic and text annotation. In addition, it contains device inquiry capabilities that allow you to use device-independent features. You can create interactive graphics applications by using input capabilities, such as choice, locator and string.

The following illustration shows an application program interface with Plotting System.



When programming with Plotting System, include calls to Plotting System routines in your application program. The external references are resolved when the compiled program is linked to the subroutine library.

To use Plotting System, you should be an experienced programmer familiar with the BASIC, C, FORTRAN or Pascal languages.

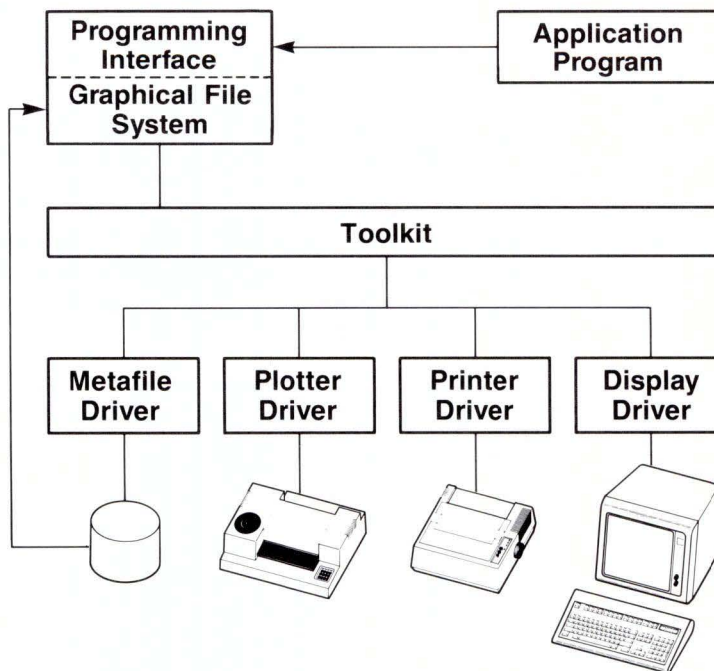
IBM RT PC Graphical File System

The Graphical File System allows you to retrieve and interpret *metafiles* that have been generated by the Metafile Device Driver within the Graphics Development Toolkit. Each metafile contains a series of pictures or graphics images that have been stored in a special metafile format. This format promotes standardization and portability between different kinds of graphics output devices.

You can use the Graphical File System as a *programming interface* or an *interactive interface*.

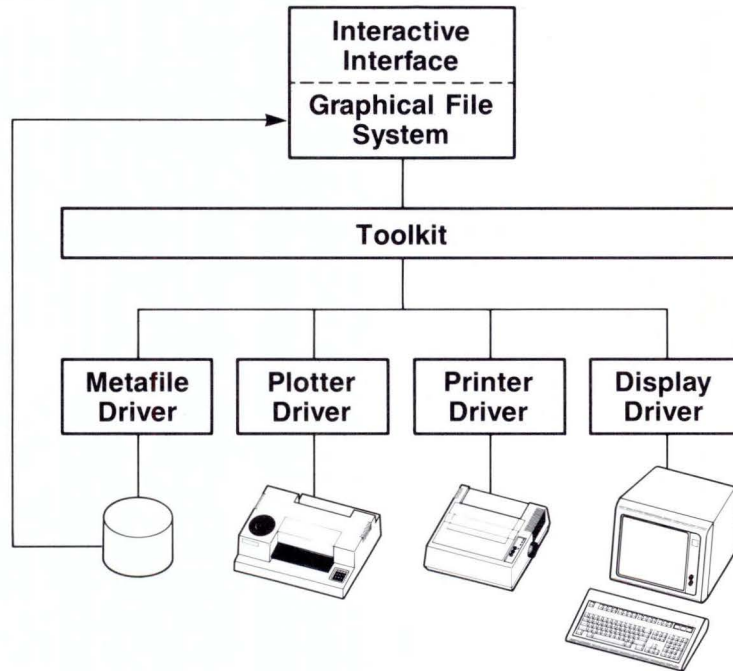
The programming interface consists of subroutines called by an application program. These subroutines are in the form of functions that retrieve metafile pictures and interpret individual *elements* within a picture. The programming interface requires programming experience in BASIC, C, FORTRAN or Pascal.

A diagram of the programming interface is shown in the following illustration.



The interactive interface, on the other hand, is an easy-to-use, icon-driven program. By selecting icons, you can perform metafile interpretation functions. To operate the interactive interface, you need no special knowledge of either graphics or programming.

The interactive interface is diagrammed in the following illustration.



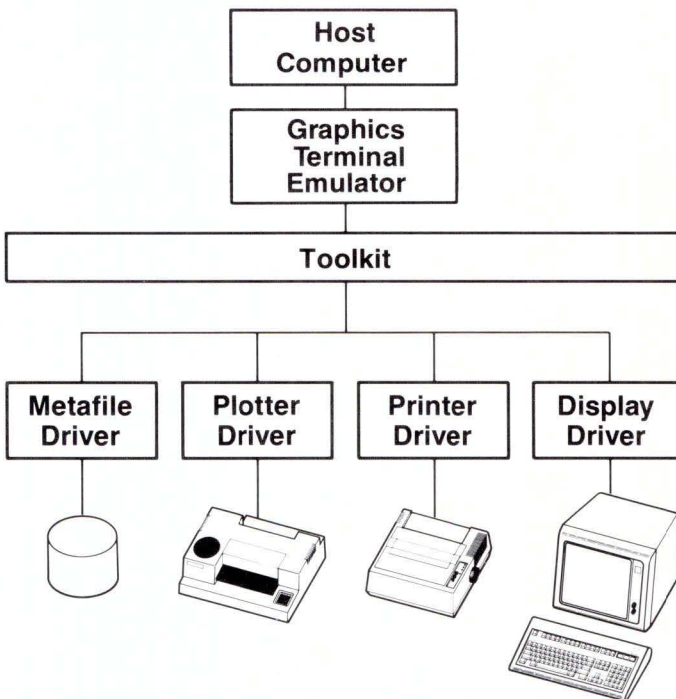
IBM RT PC Graphics Terminal Emulator

Graphics Terminal Emulator enables the IBM RT PC to emulate the Tektronix 4010 and 4012 graphics terminals, most functions of the Tektronix 4014 with the Extended Graphics Module, and selected features of the Tektronix 4105. Most functions of the Lear Siegler ADM-3A are also supported.

Graphics Terminal Emulator allows you to access host-computer software, send and receive files, and print both alphanumeric and graphic output. In addition, it reproduces the effects of the many special function keys available on the Tektronix family of supported terminals.

Because Graphics Terminal Emulator is an icon-driven system, no special knowledge of programming is required to use it. Experience on the supported terminals, however, is necessary to create graphics.

The operation of Graphics Terminal Emulator involves an external host computer, as shown in the following illustration.



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Chapter 1. Overview

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About This Chapter

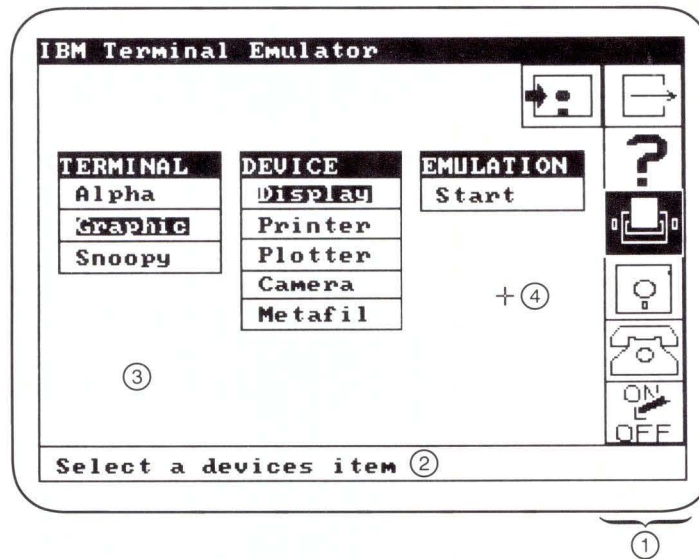
This chapter covers the fundamentals of the Graphics Terminal Emulator, including screens, menus, icons, cursors, and windows.

Screens, Icons, Menus, and Windows

The Graphics Terminal Emulator program provides a series of interactive screens which allow you to:

- Emulate a terminal attached to a host computer
- Set inter-system protocol parameters
- Transfer files between computer systems.

Each screen is composed of three areas and a *cursor*, as shown in Figure 1-1:



1. Function Area
2. Input Focus Area
3. Window Area
4. Cursor

Figure 1-1. Screen Layout

Function Area

The *function area* consists of one or two columns of function *icons*, located on the right side of the screen. The rightmost column contains icons representing Graphics Terminal Emulator's primary functions. These icons appear on every screen and can be selected at any time.

When you select a primary function icon that contains *subfunctions*, an additional column containing the subfunction icons appears. They perform particular tasks related to each primary function icon.

Input Focus Area

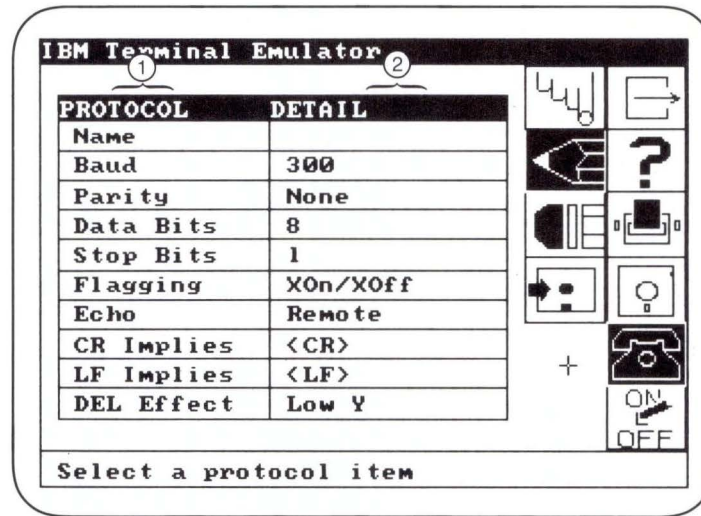
The *input focus area* is the last text line on the screen. The Graphics Terminal Emulator program uses this area to display prompts and messages. You also use the input focus area to enter data, such as file names, to Graphics Terminal Emulator.

Window Area

The window area covers the remainder of the screen. It contains parameter menus of two types: choice menus and selection menus.

For example, Figure 1-1 contains three choice menus. The Terminal Menu, located at the extreme left in Figure 1-1, presents three choices: Alpha, Graphic, and Snoopy. Only one of these choices can be active at a given time. (For more information on Alpha, Graphic, and Snoopy emulation, see Chapter 2, "Using Graphics Terminal Emulator.")

The other type of menu is the Selection Menu. This menu has two columns, as shown in Figure 1-2:



1. Parameter List
2. Parameter Value List

Figure 1-2. Parameters

The parameter list on the left side of the menu provides a list of selectable parameters, such as baud rate and parity. The parameter value list on the right side of the menu provides the value assigned to the parameters.

Parameters have more than one possible value or option. To change the value of a parameter, position the graphics cursor over the parameter or parameter value and press **Enter** or an input device button. The next possible option appears. Continue changing the value, stepping through the options, until you reach the value you want to assign to a parameter. Then move the cursor to the next option.

Prompts for information from Graphics Terminal Emulator appear in the input focus area, as do any responses you make to the prompts.

The Cursor

The cursor appears as a large plus. In Graphics Terminal Emulator, you position the cursor so that the intersection of its horizontal and vertical lines touches some part of an icon or option listed on a screen.

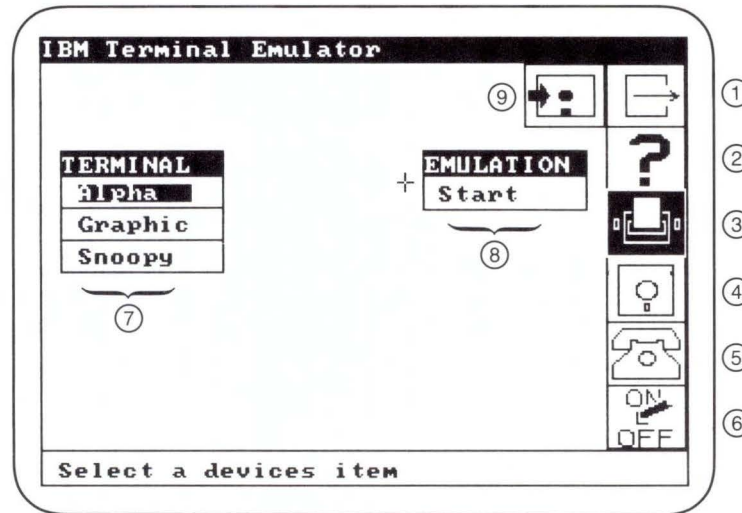
Moving the Cursor

To move the graphics cursor, you can use the four arrow keys located on the right side of your keyboard or a separate input device. Some devices provide the capability of “fine tuning” the placement of the cursor, by pressing the **Insert** key. This causes the cursor to move in smaller increments.

To move the cursor using a mouse, move the mouse on the desk top in the direction you wish the cursor to move. When the cursor is correctly positioned, record the location by pressing one of the keys on the mouse.

Home Screen

When you start Graphics Terminal Emulator, a *Home Screen* appears on your screen as shown in Figure 1-3.



- | | |
|------------------|--------------------------|
| 1. Exit Icon | 6. Switches Icon |
| 2. Help Icon | 7. Terminal Menu |
| 3. Devices Icon | 8. Emulation Menu |
| 4. Storage Icon | 9. Save Environment Icon |
| 5. Protocol Icon | |

Figure 1-3. Home Screen, Initial Display

The Devices icon is highlighted because this is the icon which activates the Home Screen. You can display the Home Screen at any time by selecting the Devices icon. The Devices icon is described in greater detail in Chapter 2, "Using Graphics Terminal Emulator."

Note: When you first install Graphics Terminal Emulator, the alpha terminal mode is selected.

Primary Function and Subfunction Icons

Graphics Terminal Emulator's primary function icons are:

- Exit
- Help
- Devices
- Storage
- Protocol
- Switches.

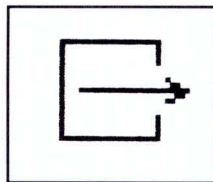
These icons appear on every Graphics Terminal Emulator screen. You can select them at any time.

Graphics Terminal Emulator provides additional icons besides the primary function icons. When you select certain primary function icons, icons representing subfunctions are displayed on the screen. The subfunction icons displayed depend on the chosen function. Graphics Terminal Emulator clears the subfunction icons from the screen when another primary function icon is selected. The subfunction icons are described in more detail in Chapter 4, "Screens and Screen Options."

To select an icon, use the arrow keys or other input device to move the graphics cursor over the icon, then press **Enter** or an input device button.

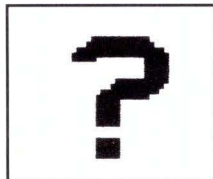
The following primary function summary provides a more detailed view of these icons.

Exit



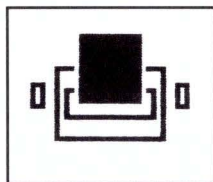
The Exit icon enables you to exit from Graphics Terminal Emulator and return to the operating system.

Help



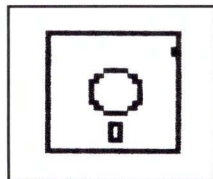
The Help icon provides a help message describing the options available to you at the current state of interaction with Graphics Terminal Emulator.

Devices



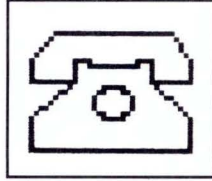
The Devices icon enables you to select the type of terminal you wish to emulate, to send output to an alternate output device, and to enter terminal emulation mode. The Devices icon has one subfunction icon, Save Environment.

Storage



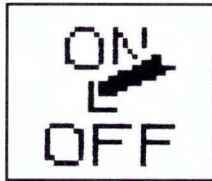
The Storage icon provides access to files through the operating system. It is also capable of initiating file upload from your computer to a host computer or a file download from the host computer to your computer. The Storage icon has the following subfunction icons: Upload, Download, Up/Down Configure, Local Command, and Save Environment.

Protocol



The Protocol icon enables you to select, define, or delete a communications protocol. It has the following subfunction icons: Select, Write, Erase, and Save Environment.

Switches



The Switches icon lets you set various switches, such as Page Full Hardcopy. Its only subfunction icon is Save Environment.

Selecting Output From the Home Screen

In addition to the function icons on the Home Screen, there are three menus in the window area—the Terminal Menu, the Device Menu, and the Emulation Menu. (See Figure 1-1.) The Device Menu is displayed only when graphic mode is selected.

Use the Terminal Menu to select the type of terminal you want to emulate, then select the output device for your computer with the Device Menu. When you select Start on the Emulation menu, terminal emulation begins.

Standard Graphics Terminal Emulator Operating Conditions

Selected icons or menu options appear dark on a light background. Otherwise, they are light on a dark background. Both a primary function icon and a subfunction icon can be highlighted at the same time.

An icon or menu option remains highlighted for as long as it is selected. A selected menu option remains in effect until you choose another option. A selected icon remains in effect until you choose another icon at the same level, either primary or subfunction. Selected values for menu options remain in effect from one Graphics Terminal Emulator session to the next.

For most screens, Graphics Terminal Emulator operates in graphic mode. This means that you can either use the arrow keys or a separate input device to move to an option you want to select.

Some screens, however, automatically activate alphanumeric mode on your computer, enabling you to enter text. In such cases the keyboard is the input device. When you finish entering text, press **Enter**. Graphics Terminal Emulator will return to graphic mode. To erase alphanumeric data you have entered in the input focus area, press the **Backspace** key once for each character you wish to erase or press **Esc** to start at the beginning of the line.

Chapter 2. Using Graphics Terminal Emulator

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About This Chapter

This chapter explains how to use the IBM RT PC Graphics Terminal Emulator to communicate with a host computer. Once communications have been established, you can perform any normal host computer function. Refer to Appendix C, “Sample Graphics Terminal Emulator Sessions”, Appendix D, “Function Key Assignments and Default Values”, and Appendix E, “Expanded Emulation Functions”, for additional information.

Note: In addition to this chapter, you must refer to your host-computer documentation for information on communication protocols and switch settings.

The following topics are covered in this chapter:

- Home Screen menus
- Establishing communication protocols
- Setting switches for Graphics Terminal Emulator
- Selecting emulation
- Selecting devices
- Beginning emulation
- Exiting the host
- Exiting Graphics Terminal Emulator.

Starting Graphics Terminal Emulator

This chapter tells you how to use Graphics Terminal Emulator to perform any normal host computer functions. If you have not already installed Graphics Terminal Emulator, refer to Appendix A, “Installing Graphics Terminal Emulator”, for the installation procedure.

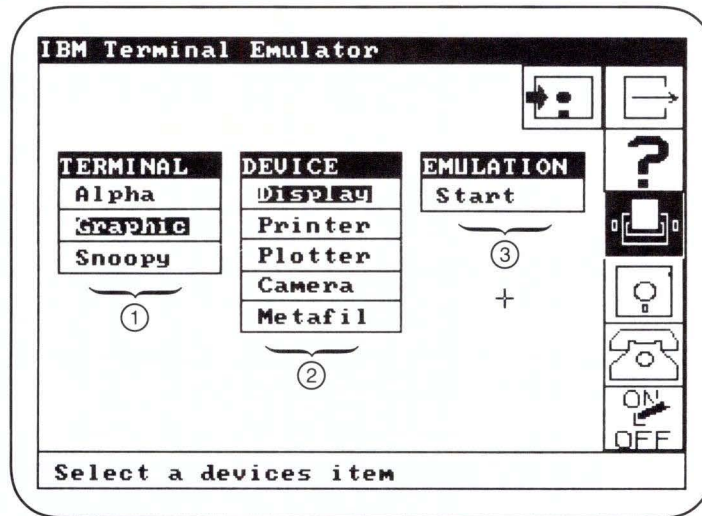
Once Graphics Terminal Emulator is installed, type the following command, after the system prompt:

```
terminal
```

and press **Enter**. A Home screen like the one shown in Figure 1-3 will appear on your graphics display device.

Home Screen Menus

You begin Graphics Terminal Emulator with the Home Screen, shown in Figure 1-3. When the Graphic mode is chosen, the Device Menu appears as shown in Figure 2-1. The Devices primary function icon is highlighted and three menus appear in the window area.



1. Terminal Menu
2. Device Menu
3. Emulation Menu

Figure 2-1. Home Screen with Device Menu

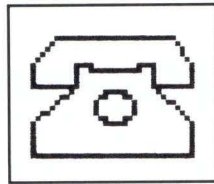
The Terminal Menu offers three terminals which you can emulate: a regular ADM-3A alphanumeric terminal (Alpha), a Tektronix graphics terminal (Graphic), or an alphanumeric terminal which displays control characters (Snoopy).

The Device Menu lists the logical names of output devices you can use with your computer: Display, Printer, Plotter, Camera, and Metafil.

The Emulation Menu places your computer in emulation mode, which enables you to sign on and interact with a host computer.

Establishing Communication Protocols

A communications protocol must be established between your computer and a host computer before data transfer can take place. To do so, use the Protocol primary function icon:



A communications protocol provides a name for the protocol and defines the baud rate, type of echoing desired, parity, carriage return effect, line feed effect, data bits, stop bits, flagging (handshaking) convention, and the effect of the DEL (rubout) character.

When you select the Protocol icon, Graphics Terminal Emulator displays the Protocol Screen, as shown in Figure 2-2:

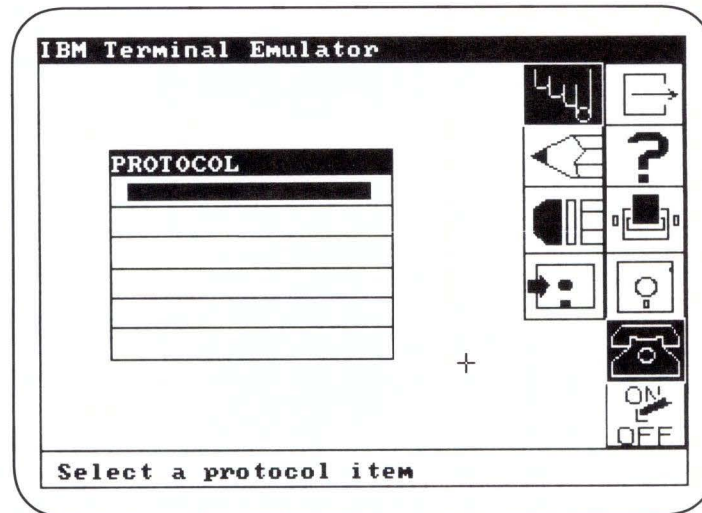


Figure 2-2. Protocol Screen

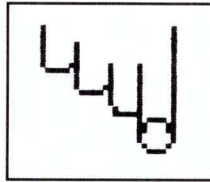
The protocol screen enables you to:

- Create a new protocol
- Select an existing protocol
- Change an existing protocol
- Delete an existing protocol.

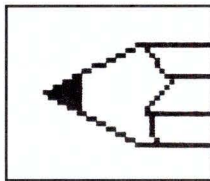
Creating a New Protocol

To create a new protocol, follow these procedures:

1. Choose the Select icon.



2. Move the graphics cursor to any empty space in the list of existing protocol configurations.
3. Press **Enter** on your keyboard or the button on your input device.
4. Select the Write subfunction icon.



Graphics Terminal Emulator displays a list of protocol parameters with a default value or option for each. The Name value is blank. A screen showing protocol parameters is shown in Figure 2-3.

5. Move the graphics cursor to the blank option for Name. Press **Enter** or an input device button. Graphics Terminal Emulator activates the alpha cursor to allow you to type a name in the input focus area.

-
6. Now you can change any of the default protocol options, as necessary. To change an option, position the graphics cursor over the option you want to change. Press **Enter** or an input device button. The next possible option appears. Continue pressing **Enter** or the button until you see the option you want to select.

PROTOCOL	DETAIL
Name	
Baud	300
Parity	None
Data Bits	8
Stop Bits	1
Flagging	XOn/XOff
Echo	Remote
CR Implies	<CR>
LF Implies	<LF>
DEL Effect	Low Y

Figure 2-3. Protocol Screen Options

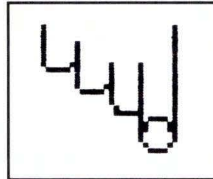
If you do not change the value for a parameter, Graphics Terminal Emulator assumes the default. Some of the parameter values are dictated by the hardware features of the host computer. The following text lists and explains communication protocol parameters:

- Name** Defines a name of up to 15 characters for the protocol. After you define the name, it appears in the protocol menu when you select the Select Subfunction icon.
- Baud** Sets the data communications rate (baud) between your computer and the host computer. The values for this parameter vary with the computer and host computer you are using. Use the Help icon to inquire about the possible baud rate options.
- Parity** Sets the parity as None, Odd or Even.

Data Bits	Defines the number of bits per data byte. The possible options for this parameter are 5, 6, 7 and 8.
Stop Bits	Defines the number of stop bits inserted at the end of every data character or block transferred. The possible options for this parameter are 1 and 2.
Flagging	Sets the flagging (handshaking) as None or XOn/XOff. XOn/XOff is a type of software handshaking available in Graphics Terminal Emulator. When the receiving buffer is filled, Graphics Terminal Emulator sends out an XOff character (Device Control-3). The host computer stops transmitting until it receives the XOn character (Device Control-1).
Echo	Determines whether all characters sent from your computer to the host are echoed on your graphics display. The possible options are Local and Remote. If Local, Graphics Terminal Emulator is in charge of echoing. If Remote, the host must perform the echoing.
CR Implies	Defines the action that Graphics Terminal Emulator performs when a carriage return character is received from the host or is echoed on your graphics display. The possible options for this parameter are <CR> (which implies a carriage return only), <LF> (which implies a line feed only), and Ignore <CR>.
LF Implies	Defines the action that Graphics Terminal Emulator performs when a line feed character is received from the host or is echoed on your graphics display. Depending on the setting you choose, <LF> is treated either as a carriage return or as a line feed.
DEL Effect	Determines whether a DEL (rubout) character received from the host is treated as a low Y coordinate or is to be ignored. The valid options for this parameter are Low Y and Ignore.

Selecting an Existing Protocol

The Select subfunction icon enables you to select an existing protocol from the list of configurations in the window area.



After you choose the Select icon, move the graphics cursor to the name of the protocol you want to activate and press **Enter** or an input device button. Graphics Terminal Emulator highlights the name of the protocol you select.

The chosen protocol continues in effect for all future communications between your computer and a host, until you change it by going through the routine just described. To communicate with another host requiring a different protocol, choose that protocol using the Select icon.

Changing an Existing Protocol

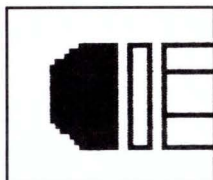
To make changes to an existing protocol, follow the same basic procedure as that for creating a new protocol. The steps for this procedure are:

1. Choose the Select subfunction icon.
2. Move the graphics cursor to the name of the desired protocol.
3. Press **Enter** or an input device button.
4. Select the Write subfunction icon.

After you select the Write icon, Graphics Terminal Emulator displays the current parameter options. To change any of the parameter options, move the graphics cursor over the option you want to change, press **Enter** or an input device button, and follow the procedure described for creating a new protocol.

Deleting an Existing Protocol

The Erase subfunction icon enables you to reset all parameters in a configuration protocol to their default values.

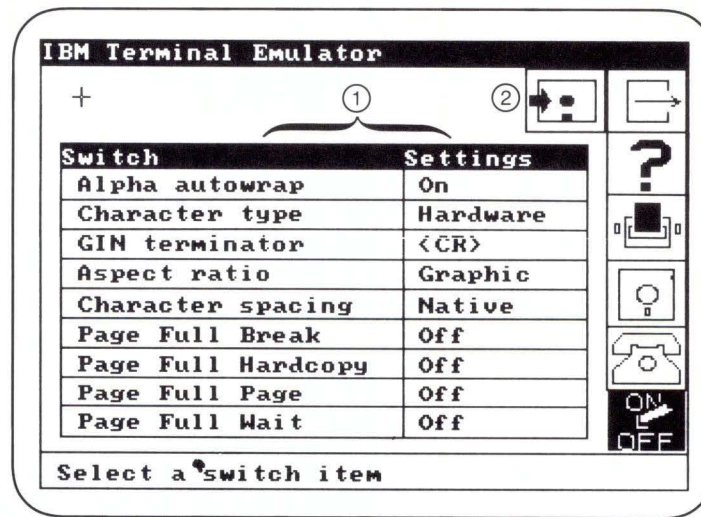


To delete an existing protocol, follow this procedure:

1. Choose the Select subfunction icon.
2. Move the graphics cursor to the name of the protocol you want to delete.
3. Press **Enter** or an input device button.
4. Select the Erase subfunction icon.
5. Press **Enter** or an input device button.
6. A prompt on the input focus area asks you to confirm the deletion request. To confirm, type the word **Yes** and press **Enter**. To negate the request, type **No** and press **Enter**.
7. The name becomes blank. The other communications parameters revert to their default values.

Setting Switches on Your Computer

After you create a communications protocol, use the Switches primary function icon to set various switches for use during terminal emulation. When you select the Switches icon, Graphics Terminal Emulator displays the Switches screen as shown in Figure 2-4:



1. Switch Setting Menu
2. Save Environment Subfunction Icon

Figure 2-4. Switches Screen

Switches are set using the Switch Setting menu. The settings which you choose can be stored in **terminal.env** by activating the Save Environment subfunction. See Appendix A, “Installing Graphics Terminal Emulator”, for a description of **terminal.env**. The nine switches that you can set are:

Alpha Autowrap Specifies whether the alphanumeric emulator should perform a carriage return/line feed sequence when a character is typed in the 80th character position of a line. The valid options for this function are On and Off. Alpha autowrap is not supported in Graphic mode.

Character Type	<p>The valid options for this function are Hardware and Stroke. When you choose Hardware, characters are produced using the fonts native to the active output device. When you choose Stroke, characters are generated as vectors and can be positioned precisely.</p> <p>Stroke characters take longer to draw and appear most frequently in presentation-quality graphics.</p>
GIN Terminator	<p>Specifies the character sequence that Graphics Terminal Emulator sends to the host at the end of a graphic input request. The valid options for this function are <CR>, <CR> <EOT>, and None.</p>
Aspect Ratio	<p>The valid options for this function are Native and Graphic. If you choose Graphic, Graphics Terminal Emulator draws an image in the largest possible subregion of the actual display, while keeping the same aspect ratio the image would have on a 4014 terminal screen. In some cases when you choose Graphic, you may not be taking full advantage of the resolution available on your display.</p> <p>If you choose Native, the image is mapped to the full-size display screen of the current output device. With aspect ratio set to Native, some images may appear distorted.</p>
Character Spacing	<p>The valid options for this function are Native and Graphic. If you choose Native, Graphics Terminal Emulator draws characters using the native character set of the current output device. If you choose Graphic, Graphics Terminal Emulator uses the character size options of a 4014 display screen and positions individual characters as if they were on a 4014 display screen. The relative position of the characters will be correct, but the actual character placement may be off.</p>
Page Full Break	<p>Sends a break instruction on a Page Full condition. The valid options are On and Off.</p>
Page Full Hardcopy	<p>Sends a Hardcopy command on a Page Full condition. The valid options are On and Off.</p>

Page Full Page	Clears the screen on a Page Full condition. The valid options are On and Off.
Page Full Wait	Waits until you type another character on a Page Full condition. The valid options are On and Off.

Note: The Page Full functions are coordinated. For example, if all Page Full functions are set to On and a Page Full condition occurs, a break instruction is sent to the host. Graphics Terminal Emulator makes a hardcopy of the screen and then clears it. Data from the host then continues to appear.

Selecting Terminal Emulation

You are now ready to select the type of terminal you wish to emulate. Select the Devices icon and move the graphics cursor to the Terminal Menu. Choose an option from this menu by placing the cursor in that option's box and press **Enter** on your keyboard or any button on your input device. The selected option becomes highlighted.

If you select the Graphic option, your terminal emulates a Tektronix graphics terminal. This means that:

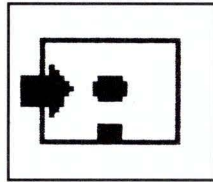
- The terminal emulates the protocols of the Tektronix 4010 and 4012 terminals, the 4014 graphics terminal with selected features of the Extended Graphics Module (EGM), and selected 4105 features. See Appendix E, "Expanded Emulation Functions", for more information.
- The display screen supports up to two margins.
- The Tektronix compaction scheme is used for graphics data.
- Selection of an alternate output device is available.

If you select the Alpha option, your terminal emulates an ADM-3A alphanumeric terminal. This means that:

- The output device is the computer monitor.
- Output scrolls continuously down from the top of the page.
- A host-resident, full-screen editor which uses the ADM-3A command set, can be used to manipulate the output.

If you select Snoopy, your computer emulates an alphanumeric terminal that allows you to display control characters on the output device. Control characters will appear as uppercase letters preceded by a caret. See Appendix F, “ASCII Character and Control Codes”, for a list of the control characters.

Having selected a mode of terminal emulation, you can store it immediately in **terminal.env**. To do so, move the graphics cursor to the Home Screen’s only subfunction icon, Save Environment, and press **Enter**. The Save Environment icon looks like this:



If you choose not to activate the Save Environment icon, your Terminal Menu option will not be stored until you exit Graphics Terminal Emulator or select this icon at a later time.

Selecting Devices

If you select the Alpha or Snoopy options in the Terminal Menu, Graphics Terminal Emulator automatically selects the Display option as your output device. If you select the Graphic option, you can choose any of the five output devices listed in the Device Menu. To select an output device, move the cursor to the desired box within the Device Menu and press **Enter** or an input device button. The five options available are Display, Printer, Plotter, Camera, and Metafil. The actual device selected is the one that has been assigned the corresponding logical device name, such as “PRINTER.” See “Setting Environmental Parameters” in Appendix A of this manual for information about setting the environment for devices.

You can store your device selection in **terminal.env** with the Save Environment icon. To do so, repeat the process for storing your terminal option.

Beginning Emulation

You are now ready to start emulation. Move the graphics cursor to the Emulation Menu and press **Enter** or any input device button. The message,

Select F9 to return to menus

appears at the bottom of the screen. Now you can log on to the host computer. If the current logical output device is set to Display, the host computer sends all output, including data, graphics, and prompts, to your graphics display.

If any other option is in effect, you must press the function key that activates the graphics toggle to switch to the specified output device. See Appendix D, “Function Key Assignments and Default Values.” When you activate the graphics toggle again, the host computer output reverts to your graphics display.

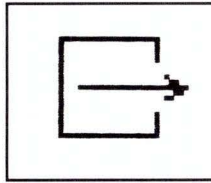
Exiting the Host

To stop receiving output from the host computer, press the **F9** key. This returns you to the Home screen. Your computer is still communicating with the host computer. You can re-activate the link between Graphics Terminal Emulator and the host by selecting the Emulation Menu and pressing **F9**.

Exiting Graphics Terminal Emulator

Before exiting Graphics Terminal Emulator, it is advisable to log off the host computer.

To exit Graphics Terminal Emulator, move the graphics cursor to the Exit primary function icon.



When the cursor is positioned on the Exit icon, activate that icon by pressing **Enter** or an input device button. You immediately leave Graphics Terminal Emulator and return to the operating system prompt.

Chapter 3. Transferring Files and Accessing the AIX Operating System

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Uploading and Downloading Files	3-4
Using the Up/Down Configure Subfunction Icon	3-6
Using the Upload Subfunction Icon	3-7
Using the Download Subfunction Icon	3-8
Accessing the AIX Operating System	3-9

About This Chapter

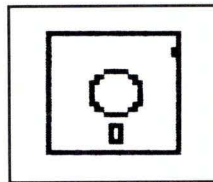
This chapter tells you how to transfer files between your computer and a host computer and how to access the IBM AIX Operating System. The process of transferring files to the host computer is known as *uploading*, while transferring files from the host computer is called *downloading*.

Uploading and Downloading Files

Successful completion of the following procedures requires that you be familiar with the host-computer commands necessary to transfer files. Using these commands, files can be transferred in two directions with Graphics Terminal Emulator. You can upload a file from your computer to the host computer, or download a file from the host to your computer.

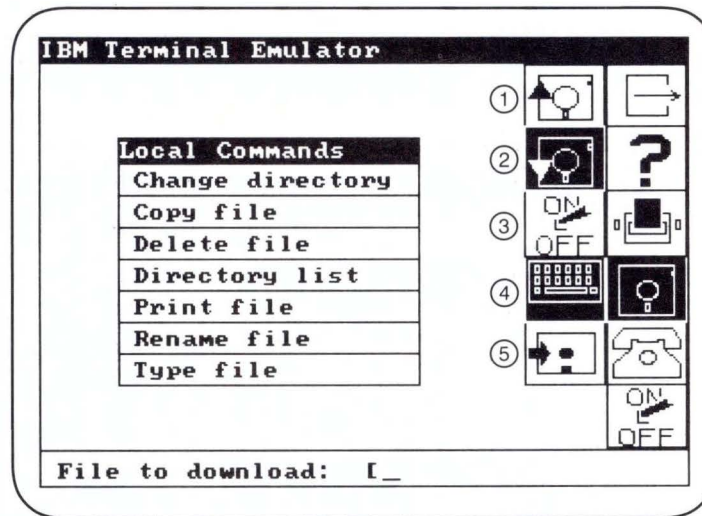
Note: At any time after you have established communications with the host computer, you can toggle back to Graphics Terminal Emulator by pressing the **F9** key.

To transfer files between your computer and a host computer, use the Storage primary function icon. It is located on the Home Screen.



This icon also allows you to issue selected IBM AIX Operating System commands.

When you select the Storage icon, Graphics Terminal Emulator displays the Storage Screen, as shown in Figure 3-1:



1. Upload Subfunction Icon
2. Download Subfunction Icon
3. Up/Down Configure Subfunction Icon
4. Local Commands Subfunction Icon
5. Save Environment Subfunction Icon

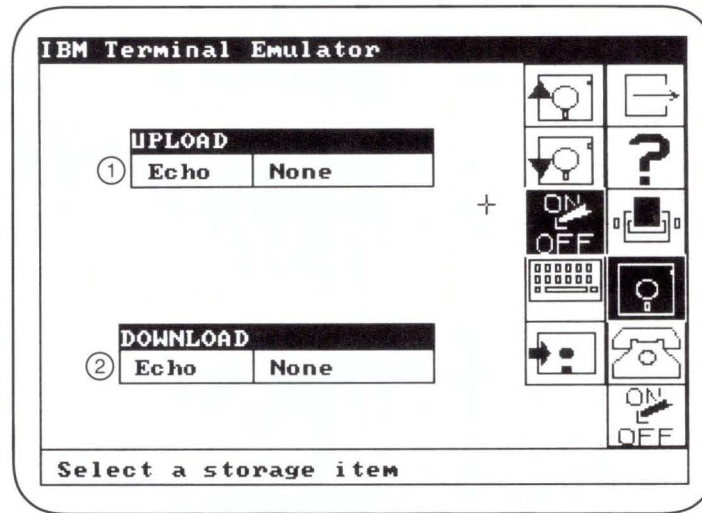
Figure 3-1. Storage Screen

The Storage Screen contains five subfunction icons.

- Upload, Download, and Up/Down Configure subfunction icons (1, 2, and 3 in Figure 3-1). These are used for transferring files.
- Local Commands subfunction icon (4 in Figure 3-1). This icon displays a menu of the IBM AIX Operating System functions.
- Save Environment subfunction icon (5 in Figure 3-1). This stores upload/download parameters in **terminal.env**.

Using the Up/Down Configure Subfunction Icon

Selecting the Up/Down Configure subfunction icon enables you to define the type of echoing desired during file uploading or downloading. The Up/Down Configure icon displays an Upload and a Download Menu in the window area as shown in Figure 3-2:



1. Upload Menu
2. Download Menu

Figure 3-2. Upload and Download Menus

For both uploading and downloading, you need to specify only one parameter: the type of echoing desired. The possible options are None, Display (if you want the echoing to appear at your graphics display device), and Printer (if you want the echoing to appear at a printer attached to your computer).

If you choose None, Graphics Terminal Emulator displays the first six characters of each line at the bottom of your graphics display device screen. If you choose Display, Graphics Terminal Emulator echoes each full line. If you choose Printer, Graphics Terminal Emulator echoes each full line to the printer.

To choose the type of echoing, move the graphics cursor to the Upload or Download Menu. Press **Enter** or an input device button. The echo parameter value changes to the next possible value. Continue changing the value, by stepping through the options, until you reach the value you wish to assign to the parameter.

Using the Upload Subfunction Icon

Selecting the Upload subfunction icon enables you to upload a file from your computer to a host computer.

When you select the Upload icon, the following query appears in the input focus area at the bottom of the screen:

```
File to upload: [
```

Type the name of the file you want to upload. Press **Enter**. If you make a mistake while entering the file name, use the **Backspace** key to erase the incorrect characters or **Esc** to start over.

When you press **Enter** after the correct file name has been entered, Graphics Terminal Emulator erases the screen and displays this message in the input focus area:

```
Connected to host
```

Type the commands that you would normally use to create a file. For example, on a host with an operating system such as the IBM AIX Operating System, the command is:

```
cat > filename <CR>
```

The actual command(s) are host-dependent; refer to your host computer documentation. Press the **F9** key to begin the upload operation. The file is then sent to the host. The upload echoing keeps you informed of the progress of the upload operation. When uploading is complete, Graphics Terminal Emulator displays the message

```
Connected to host.
```

Type the appropriate command(s) to end the upload operation on the host computer.

Pressing any key during the operation stops the upload process.

Using the Download Subfunction Icon

Selecting the Download subfunction icon enables you to download a file from a host computer to your computer. When you select the Download icon, the following query appears in the input focus area:

```
File to download: [
```

Type the name of the file you want to receive the downloaded data. Press **Enter**. If you make a mistake while entering the file name, use the **Backspace** key to erase the incorrect characters or **Esc** to start over.

When you press **Enter** after the file name has been correctly entered, Graphics Terminal Emulator erases the screen and displays this message in the input focus area:

```
Connected to host
```

Type the command(s) that you would normally use to view the contents of the file. (These commands are host-dependent; refer to your host computer documentation.)

Do not type the last character of the command. Instead, press **F9**. Graphics Terminal Emulator then prompts you for the last character of the command. Typing this character begins the download operation.

Pressing any key during the download stops the download process.

The download echoing keeps you informed of the progress of the download operation. When downloading is complete, press **F9** again. Graphics Terminal Emulator displays this message:

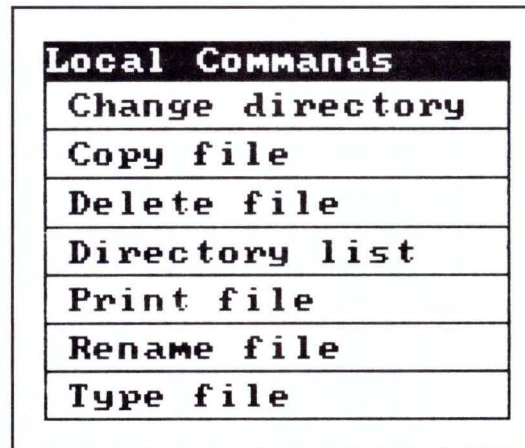
```
Connected to host.
```

Type the appropriate commands to terminate the download operation on the host computer. (These commands are host-dependent; refer to your host computer documentation.) The characters you type to terminate the download on the host do not appear in the downloaded file.

To return to the Storage Screen, press **F9**.

Accessing the AIX Operating System

In addition to uploading and downloading files, the Storage icon gives you access to certain IBM AIX Operating System functions. When you choose the Local Commands subfunction icon, Graphics Terminal Emulator displays a menu of the available functions, shown in Figure 3-3:

A screenshot of a menu titled "Local Commands" with a list of seven options: Change directory, Copy file, Delete file, Directory list, Print file, Rename file, and Type file. The menu is enclosed in a rectangular border.

Local Commands
Change directory
Copy file
Delete file
Directory list
Print file
Rename file
Type file

Figure 3-3. Local Commands Menu

To choose a function, position the graphics cursor over a command name and press **Enter** or an input device button. Graphics Terminal Emulator then prompts you in the input focus area for the information necessary to carry out the command.

The following IBM AIX Operating System functions are available in Graphics Terminal Emulator:

Change Directory Enables you to change the current directory. Graphics Terminal Emulator prompts you for the new directory. Type the name and press **Enter**. Use the **Backspace** key to erase any incorrect characters. The new directory is active until you change it or until you exit from Graphics Terminal Emulator.

Copy File Enables you to copy one file to another file. Graphics Terminal Emulator prompts you for the *from* file name and the *to* file name. Type the names and press **Enter** after each. Use the **Backspace** key to erase incorrect characters. No global filename characters (such as * and ?) can be used with this command.

Delete File Enables you to delete a file. Graphics Terminal Emulator prompts you for the name of the file. Type the name and press **Enter**. Use the **Backspace** key to erase incorrect characters.

Directory List Enables you to display a list of the files in any directory. Press **Enter** to list the current directory. Relative or fully qualified pathnames may be used for listing other directories. Use the **Backspace** key to erase incorrect characters.

To continue processing after the directory display, press **Enter** again.

The "*" and "?" global filename characters can be used with this command. If the directory is larger than one full screen, Graphics Terminal Emulator prompts you with

Press Enter to continue

Pressing any other key ends the directory list.

-
- Print File** Enables you to print a file on a printer defined by the PRINTER environment variable. Graphics Terminal Emulator prompts you for the file name. Type the name and press **Enter**. Use the **Backspace** key to erase incorrect characters.
- Rename File** Enables you to rename a file. Graphics Terminal Emulator prompts you for the old and new names of the file. Type the names and press **Enter** after each. Use the **Backspace** key to erase incorrect characters.
- Type File** Enables you to display the contents of a file. Graphics Terminal Emulator prompts you for the file name. Type the name and press **Enter**. Use the **Backspace** key to erase incorrect characters. When the screen is full, the display stops until the **Enter** key is pressed. To continue processing after the file display, press **Enter** again.

Chapter 4. Screens And Screen Options

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About This Chapter

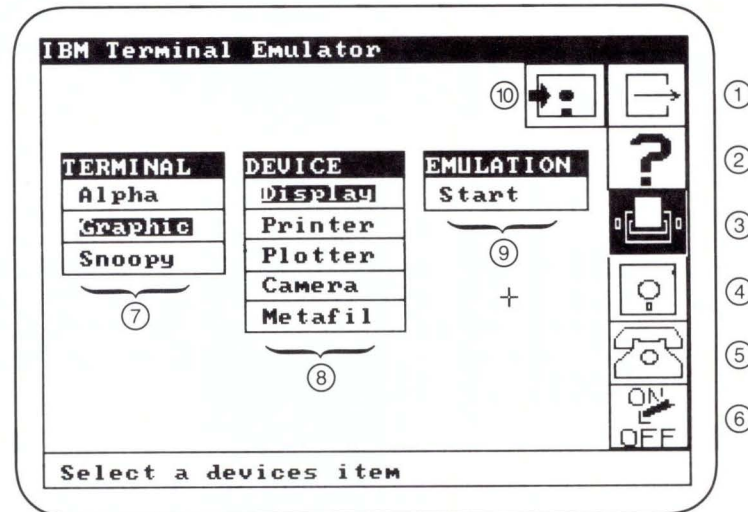
This chapter further explains the Graphics Terminal Emulator screens, the primary function icons, and the various subfunction icons and menus that accompany them. There are four basic screens in Graphics Terminal Emulator:

- Home Screen
- Storage Screen
- Protocol Screen
- Switches Screen.

Each screen has a function area, a window area, an input focus area, and cursors. Each also contains the six primary function icons. These icons allow you to move from screen to screen and perform specific functions. The selection of one of these icons prompts its subfunction icons to appear on the screen. You can then select from the subfunctions.

Home Screen

The Home Screen is the first screen that appears when you begin the Graphics Terminal Emulator program. It is shown in Figure 4-1.

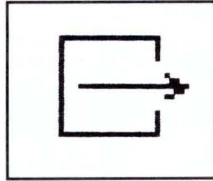


- | | |
|------------------|---------------------------------------|
| 1. Exit Icon | 6. Switches Icon |
| 2. Help Icon | 7. Terminal Menu |
| 3. Devices Icon | 8. Device Menu |
| 4. Storage Icon | 9. Emulation Menu |
| 5. Protocol Icon | 10. Save Environment Subfunction Icon |

Figure 4-1. Home Screen

The Home Screen displays six primary function icons, three menus, and one subfunction icon. The primary function icons are:

Exit Icon

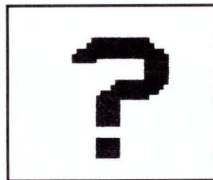


The Exit primary function icon ends the Graphics Terminal Emulator program and returns control to the operating system. If you wish to run Graphics Terminal Emulator again, enter:

```
terminal
```

then press **Enter** at the operating system prompt. Graphics Terminal Emulator then returns you to the Home Screen.

Help Icon



The Help icon provides instructional information about the operation of Graphics Terminal Emulator. When you select this icon, a message appears in the input focus area giving you options for more information.

Move the graphics cursor to the particular icon or menu option for which you need additional information, and press **Enter** or an input device button. Graphics Terminal Emulator displays a Help Window on the screen, as shown in Figure 4-2.

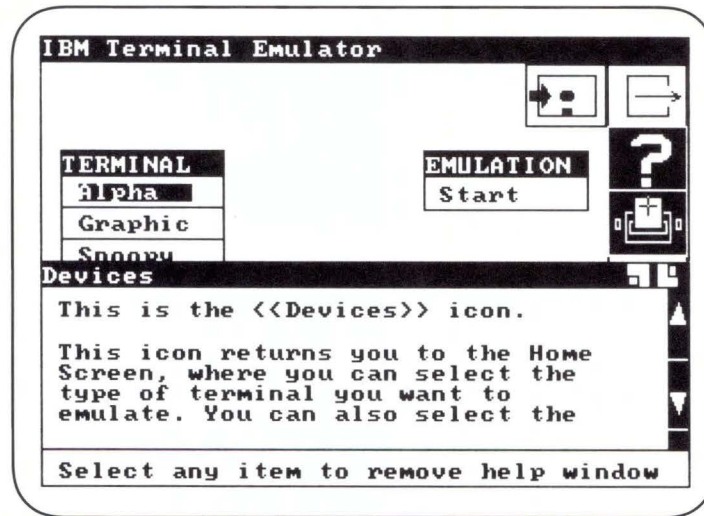


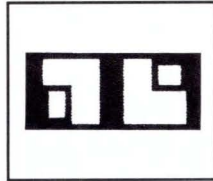
Figure 4-2. Help Window

The Help Window displays information about the requested option. If the help message is too long to fit in the Help Window, only the first part of the message is initially displayed. To view the rest of it, move the graphics cursor to the down arrow portion of the arrow bar on the right side of the window. Press **Enter** or an input device button. The message scrolls down, revealing the next part.

If you want to see the first part of the help message again, use the up arrow portion of the arrow bar. Or you can choose the square below the down arrow on the arrow bar to take you back to the first sentence of the help message.

When you have finished reading the help message, activate an icon or menu option by moving the graphics cursor as usual. You can also erase the help message by positioning the graphics cursor anywhere on the Help Window except on the arrow bars. Press **Enter** or an input device button. You will return to the screen that was displayed before you activated the Help icon.

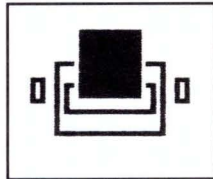
The Help icon has a Move Window icon:



The Move Window icon enables you to change the size of the help window. If you choose the left part of the icon, Graphics Terminal Emulator anchors the lower left corner of the window as you *rubberband* (move) the upper right corner. If you choose the right part of the icon, Graphics Terminal Emulator anchors the upper right corner of the window as you rubberband the lower left corner.

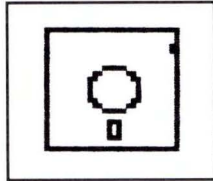
The size and position you set is saved in **terminal.env** when you exit Graphics Terminal Emulator, or when you select the Save Environment Subfunction Icon.

Devices Icon



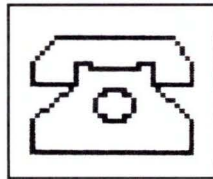
The Devices primary function icon is highlighted on the Home Screen because it is the Devices icon that activates the Home Screen. Whenever you want to return to the Home Screen, select the Devices icon.

Storage Icon



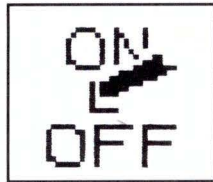
Activating the Storage primary function icon displays the Storage Screen. Using the options displayed there, you can upload a file from your computer to the host computer, download a file from the host computer to your computer, and issue operating system commands. See the Storage Screen section of this chapter for more information.

Protocol Icon



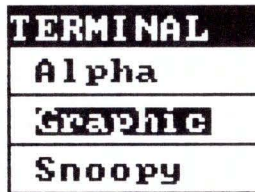
The Protocol primary function icon causes the Protocol Screen to be displayed, enabling you to define, change, or delete a communications protocol. See the Protocol Screen section of this chapter for more information.

Switches Icon



Activating the Switches primary function icon causes the Switches Screen to be displayed. From this display, you can set switches that will be used during terminal emulation. For more information, see the Switches Screen section of this chapter.

Terminal Menu



The Terminal Menu allows you to select one of three modes of terminal emulation: Alpha, Graphic, or Snoopy.

If you choose to emulate a graphics terminal, Graphics Terminal Emulator assumes the following:

- The terminal emulates the protocols of the Tektronix 4010 and 4012 terminals, the 4014 graphics terminal with selected features of the Extended Graphics Module (EGM), and selected 4105 features. See Appendix E, “Expanded Emulation Functions”, for more information.
- The display screen supports up to two margins.
- The Tektronix compaction scheme is used for graphics data.
- Selection of an alternate output device is available.

If you choose to emulate an alphanumeric terminal, Graphics Terminal Emulator assumes the following:

- The output device is the graphics display device.
- Output scrolls continuously down from the top of the page.
- A full-screen editor, based on the ADM-3A command set, can be used on the host computer.

When Alpha or Snoopy are chosen, Graphics Terminal Emulator automatically assumes that your computer output device is Display. This prevents you from inadvertently performing alphanumeric output operations on any device except the graphics display device.

Device Menu

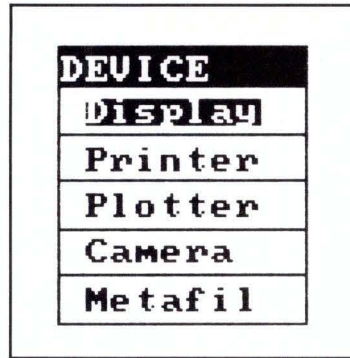


Figure 4-3. Device Menu As Displayed on the Home Screen

When you use the Graphic mode of terminal emulation, you can use the Device Menu to select an output device from these options:

- | | |
|----------------|--|
| Display | Displays output on your screen. |
| Printer | Prints output on a printer attached to your computer. |
| Plotter | Plots output on a plotter attached to your computer. |
| Camera | Enables you to use a device connected to your computer for taking pictures of the screen contents. |
| Metafil | Stores output in a file in metafile format. |

See “Setting Environmental Parameters” in Appendix A of this manual for a description of how to assign these logical device names to physical devices.

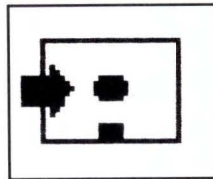
Emulation Menu



The Emulation Menu is used to begin online interaction between your computer and the host computer. To initiate this interaction, move the graphics cursor to the Emulation Menu and press **Enter** or an input device key.

If the device you selected was Display, the host computer sends all further output to your graphics display. If you selected another option, you must press **F5**, to switch to the specified output device. Pressing **F5** again returns the output to the graphics display.

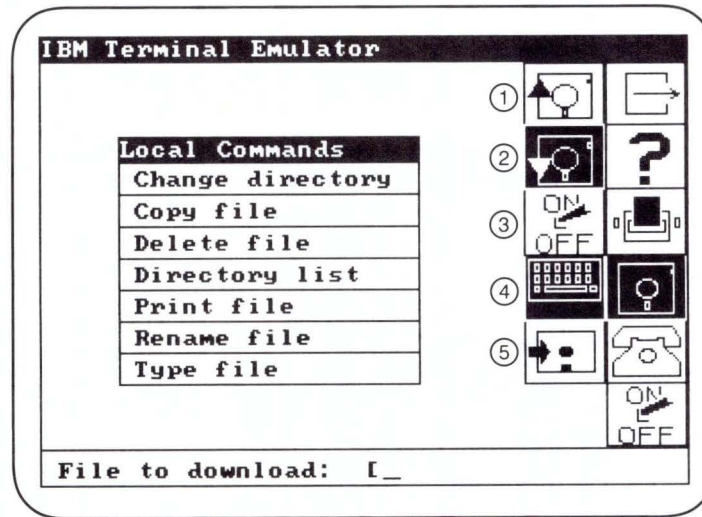
Save Environment Subfunction Icon



The Save Environment subfunction icon enables you to permanently save in **terminal.env** all options specified with the primary function icons.

Storage Screen

The Storage Screen appears whenever you activate the Storage icon. The Storage Screen allows you to transfer files between your computer and a host computer. From this screen, you can also issue various commands to the operating system. The Storage Screen is shown in Figure 4-4:

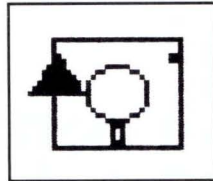


1. Upload Subfunction Icon
2. Download Subfunction Icon
3. Up/Down Configure Subfunction Icon
4. Local Commands Subfunction Icon
5. Save Environment Subfunction Icon

Figure 4-4. Storage Screen

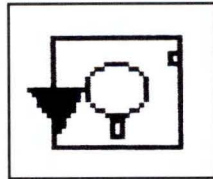
The Storage Screen contains five subfunction icons:

Upload Subfunction Icon



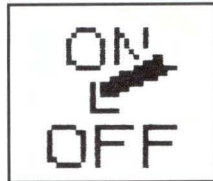
The Upload Subfunction icon enables you to upload (transfer) a file from your computer to a host computer.

Download Subfunction Icon



The Download Subfunction icon enables you to download (transfer) a file from a host computer to your computer.

Up/Down Configure Subfunction Icon



The Up/Down Configure Subfunction icon enables you to define the type of echoing desired during uploading and downloading. When you select the Up/Down Configure icon, the Storage Screen changes, as shown in Figure 4-5. The options for Echo are:

- None
- Display
- Printer.

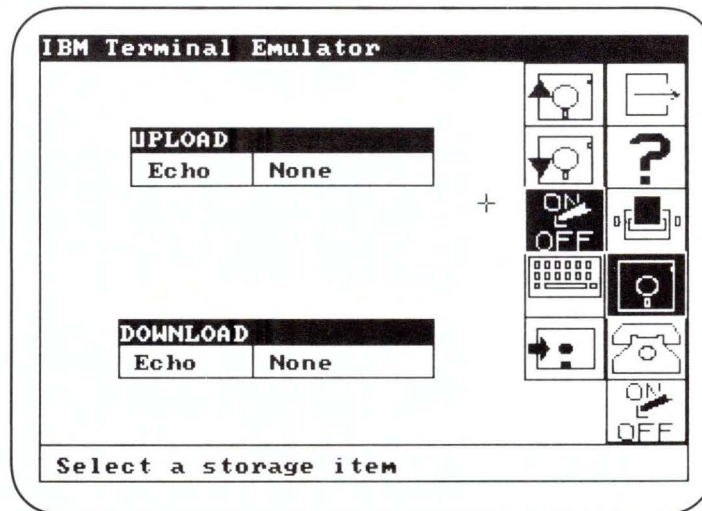
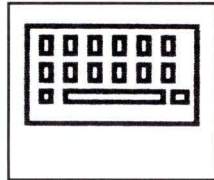


Figure 4-5. After Selecting Up/Down Configure Icon

Local Commands Subfunction Icon



The Local Command Subfunction icon permits access to various operating system functions from within Graphics Terminal Emulator. You have the following options:

- | | |
|-------------------------|---|
| Change Directory | Enables you to change the current directory. Graphics Terminal Emulator prompts you for the new directory. Type the name and press Enter . Use the Backspace key to erase any incorrect characters. The new directory is active until you change it. However, if you exit Graphics Terminal Emulator, you will be in the directory in which you started the Graphics Terminal Emulator session. |
| Copy File | Enables you to copy one file to another file. Graphics Terminal Emulator prompts you for the <i>from</i> file name and the <i>to</i> file name. Type the names, pressing Enter after each name. Use the Backspace key to erase incorrect characters. No global filename characters (such as * and ?) can be used with this command. |
| Delete File | Enables you to delete a file. Graphics Terminal Emulator prompts you for the name of the file. Type the name and press Enter . Use the Backspace key to erase incorrect characters. |
| Directory List | Enables you to display a list of the files in any directory. Press Enter to list the current directory. Relative or fully qualified pathnames may be used for listing other directories. Press Enter . Use the Backspace key to erase incorrect characters. |

To continue processing after the directory display, press **Enter** again.

The “*” and “?” global filename characters can be used with this command. If the directory is larger than one full screen, Graphics Terminal Emulator prompts you with

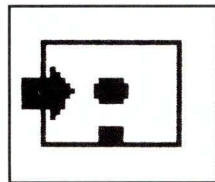
Press Enter to continue

Pressing any other key ends the directory list.

- Print File** Enables you to print a file on a printer attached to your computer. Graphics Terminal Emulator prompts you for the name of the file. Type the name and press **Enter**. Use the **Backspace** key to erase incorrect characters.
- Rename File** Enables you to rename a file. Graphics Terminal Emulator prompts you for the name of the file. Type the names and press **Enter** after each. Use the **Backspace** key to erase incorrect characters.
- Type File** Enables you to display the contents of a file. Graphics Terminal Emulator prompts you for the file name. Type the name and press **Enter**. Use the **Backspace** key to erase incorrect characters. When the screen is full, the display stops until the **Enter** key is pressed. To continue processing after the file display, press **Enter** again.

The operating system functions appear in the window area of the original Storage Screen. See Figure 3-3.

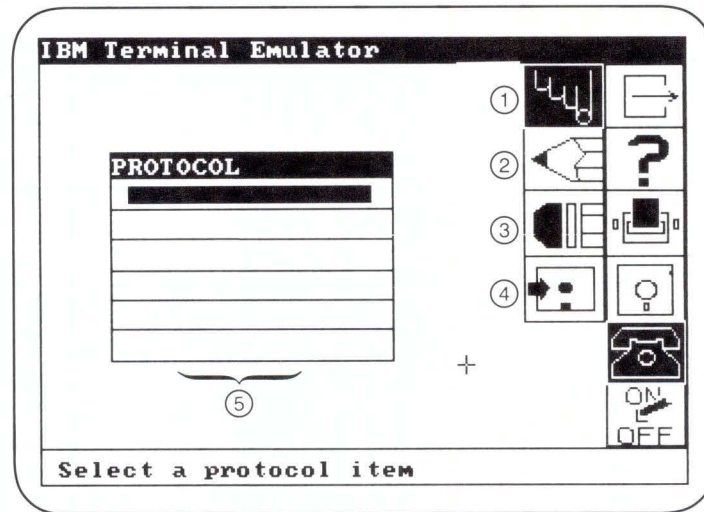
Save Environment Subfunction Icon



The Save Environment subfunction icon enables you to store the options you have chosen using the Storage icon in **terminal.env**.

Protocol Screen

You activate the Protocol Screen with the Protocol primary function icon. Use this screen to establish a communications protocol for transferring data between your computer and a host computer. You can define and store multiple configurations and select the one you need for a given data transfer. The Protocol Screen is shown in Figure 4-6.

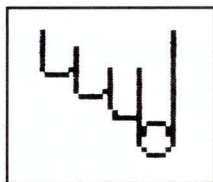


1. Select Subfunction Icon
2. Write Subfunction Icon
3. Erase Subfunction Icon
4. Save Environment Subfunction Icon
5. List of Existing Protocols

Figure 4-6. Protocol Screen

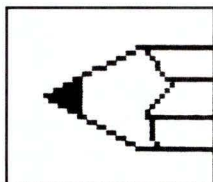
The Protocol Screen contains four subfunction icons and a list of existing protocol names:

Select Subfunction Icon



The Select subfunction icon enables you to activate a communications protocol.

Write Subfunction Icon



The Write subfunction icon enables you to define or change the parameters of a communications protocol.

When you select the Write Subfunction icons, the following Protocol Parameters list appears as shown in Figure 4-7.

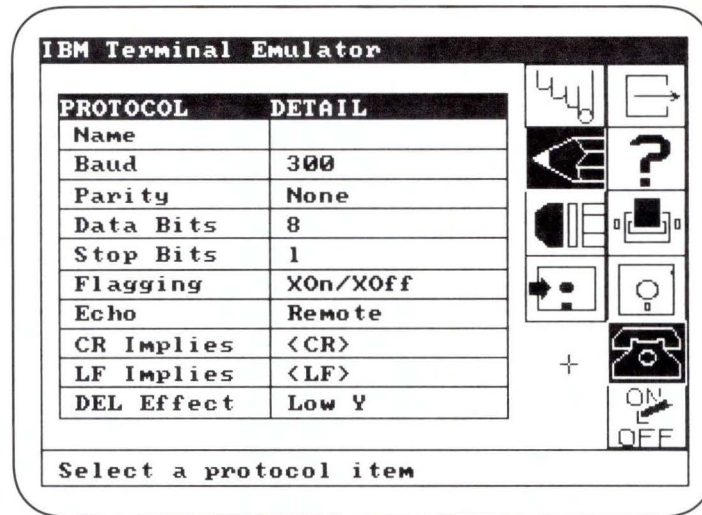


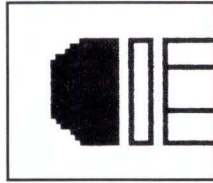
Figure 4-7. Write Subfunction Icon Activated

The Protocol Parameters are:

- Name** Defines a name of up to 15 characters for the protocol. After you define the name, it appears in the protocol menu when you select the Select Subfunction icon.
- Baud** Sets the data communications rate (baud) between your computer and the host computer. The values for this parameter vary with the computer and host computer you are using. Use the Help icon to inquire about the possible baud rate options.
- Parity** Sets the parity as None, Odd, or Even.
- Data Bits** Defines the number of bits per data byte. The possible options for this parameter are 5, 6, 7 and 8.
- Stop Bits** Defines the number of stop bits inserted at the end of every data character or block transferred. The possible values for this parameter are 1 and 2.

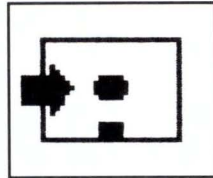
Flagging	Sets the flagging (handshaking) as None or XOn/XOff. XOn/XOff is a type of software handshaking available in Graphics Terminal Emulator. When the receiving buffer is filled, Graphics Terminal Emulator sends out an XOff character (Device Control-3). The host computer stops transmitting until it receives the XOn character (Device Control-1).
Echo	Determines whether all characters sent from your computer to the host are echoed on your graphics display. The possible options are Local and Remote. If Local, Graphics Terminal Emulator is in charge of echoing. If Remote, the host must perform the echoing.
CR Implies	Defines the action that Graphics Terminal Emulator performs when a carriage return character is received from the host or is echoed on your computer. The possible values for this parameter are <CR> (which implies a carriage return only), <LF> (which implies a line feed only), and Ignore <CR>.
LF Implies	Defines the action that Graphics Terminal Emulator performs when a line feed character is received from the host or is echoed on your graphics display. Depending on the setting you choose, <LF> is treated either as a carriage return or as a line feed.
DEL Effect	Determines whether a DEL (rubout) character received from the host is treated as a low Y coordinate or is to be ignored. The valid options for this parameter are Low Y and Ignore.

Erase Subfunction Icon



The Erase subfunction icon enables you to delete a communications protocol. Graphics Terminal Emulator displays a message which asks if you want to delete the highlighted protocol from the protocol list. You respond by entering **Yes** or **No**.

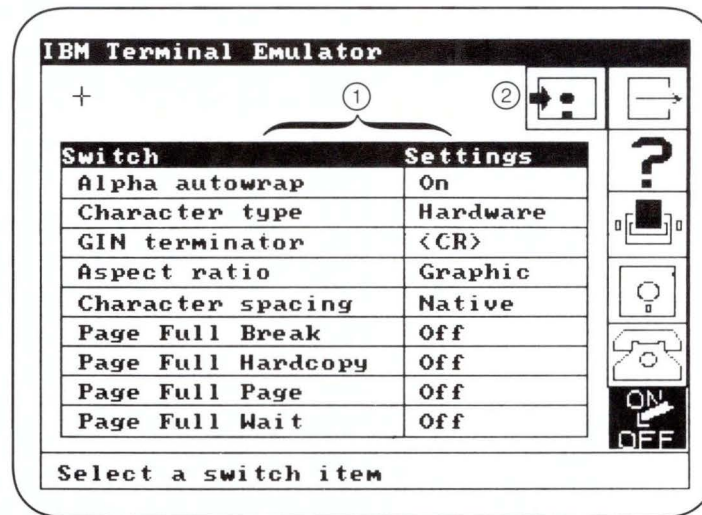
Save Environment Subfunction Icon



The Save Environment subfunction icon enables you to save your selections from the protocol list permanently in **terminal.env**.

Switches Screen

The Switches Screen is activated by the Switches primary function icon. This screen sets various switches for use during terminal emulation. The Switches Screen is shown in Figure 4-8.



1. Switch Setting Menu
2. Save Environment Subfunction Icon

Figure 4-8. Switches Screen

Switch Setting Menu

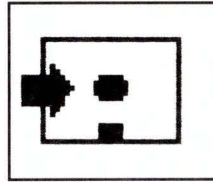
The Switch Setting Menu shown in Figure 4-8 lists the nine switches you can set. The following text explains each of these switches.

Alpha Autowrap Specifies whether the alphanumeric emulator should perform a carriage return/line feed sequence when a character is typed in the 80th character position of a line. The valid options for this function are On and Off. Alpha autowrap is not supported in Graphic mode.

Character Type	<p>The valid options for this function are Hardware and Stroke. When you choose Hardware, characters are produced using the fonts native to the active output device. When you choose Stroke, characters are host-generated as vectors and can be positioned precisely.</p> <p>Stroke characters take longer to draw and appear most frequently in presentation-quality graphics.</p>
GIN Terminator	<p>Specifies the character sequence that Graphics Terminal Emulator sends to the host at the end of a graphic input request. The valid options for this function are <CR>, <CR> <EOT>, and None.</p>
Aspect Ratio	<p>The valid options for this function are Native and Graphic. If you choose Graphic, Graphics Terminal Emulator draws an image in the largest possible subregion of the actual display, while keeping the same aspect ratio the image would have on a 4014 terminal screen. In some cases, when you choose Graphic, you may not be taking full advantage of the resolution available on your display.</p> <p>If you choose Native, the image is mapped to the full-size display screen of the current output device. With aspect ratio set to Native, some images may appear distorted.</p>
Character Spacing	<p>The valid options for this function are Native and Graphic. If you choose Native, Graphics Terminal Emulator draws characters using the native character set of the current output device. If you choose Graphic, Graphics Terminal Emulator uses the character size options of a 4014 display screen and positions individual characters as if they were on a 4014 display screen. The relative position of the characters will be correct, but the actual character placement may be off.</p>

Page Full Break	Sends a break instruction on a Page Full condition. The valid options are On and Off.
Page Full Hardcopy	Sends a Hardcopy command on a Page Full condition. The valid options are On and Off.
Page Full Page	Clears the screen on a Page Full condition. The valid options are On and Off.
Page Full Wait	Waits until you type another character on a Page Full condition. The valid options are On and Off.

Save Environment Subfunction Icon



The Save Environment subfunction icon enables you to save permanently in **terminal.env** all options specified with the Switches icon.

Appendix A. Installing Graphics Terminal Emulator

Graphics Terminal Emulator enables your computer to emulate graphics terminals, access host computer software, transfer files between computers, and print both alphanumeric and graphic output. This appendix explains how to install the IBM RT PC Graphics Terminal Emulator. Before you install this software, the IBM AIX Operating System and the IBM RT PC Graphics Development Toolkit device drivers must be installed. These device drivers are provided as part of the IBM RT PC Multi-User programs.

Installation Procedure

This section describes the installation procedure. If any error messages occur during the procedure, see the *IBM RT PC Messages Reference*.

The Graphics Terminal Emulator product includes a single diskette. Remove this diskette from the plastic envelope at the back of the binder.

1. Make sure that no one else is using the system and that no user programs are running. If the system is not in a quiet state, problems may occur as you install the various files for your licensed product.
2. Log in as super-user or as a member of the system group. You must have super-user authority, or be a member of the system group, to install a licensed program product. See the *IBM RT PC Using and Managing the AIX Operating System* for more information.

After you log in, you will see the # prompt.

3. Type **installp** then press **Enter**.

```
# installp
```

-
4. The following message appears to remind you to make sure that the system is quiet:

```
000-123 Before you continue, you must make sure there
        is no other activity on the system. You
        should have just restarted the system, and no
        other users should be logged on. Refer to
        your messages reference book for more
        information.
```

```
Do you want to continue with this command?
(y or n)
```

Type **y** and press **Enter** to continue with the **installp** command.

5. Insert your program diskette in response to the prompt. Then press **Enter**.

Insert the program diskette into diskette drive “/dev/rfd0” and then press **Enter**.

6. In response to the prompt, type **y** to indicate that you wish to continue with the installation. Then, press **Enter**.

```
The program "Graphics Terminal Emulator"
will be installed.
```

```
Do you want to do this? (y/n)
```

7. If a version of this program has already been installed on your system, a message explains that the version of the program you are about to install is the same as or older than the version you already have installed on your system. Indicate whether you wish to go ahead with the installation.

```
You are about to install version 'xx.xx.xxxx' of this
program. This version is the same as or older than
the version currently on your system.
Do you want to do this? (y/n)
```

If you type **y** and press **Enter**, the installation process begins.

```
Please insert the diskette in /dev/rfd0
```

Your program diskette should already be in the diskette drive (/dev/rfd0). **Type Return** is the same as **Press Enter**. As installation continues, various files are listed on the screen as they are copied to the fixed disk.

-
8. When installation is complete, remove the program diskette from the diskette drive and replace it in its protective envelope in the binder.

The installation process has completed.

9. Log off as super-user or as a member of the system group.

You may now begin using Graphics Terminal Emulator.

Checking Distribution Files

Graphics Terminal Emulator requires approximately 400 blocks on the **/usr** minidisk. See *IBM RT PC Installing and Customizing the AIX Operating System* for additional information concerning minidisk size requirements and planning.

Following is a list of the files on the Graphics Terminal Emulator diskette. These files will be transferred by the installation procedure to the directories indicated.

```
/usr/lpp/gterm/bin/terminal  
/usr/lpp/gterm/bin/terminal.etc  
/usr/lpp/gterm/bin/terminal.env  
/usr/lpp/vdi/fonts/font101.tbl
```

terminal is the file that starts Graphics Terminal Emulator.

terminal.etc contains the icons you use when selecting functions and the text of help messages and prompts.

terminal.env contains the default settings for uploading, downloading and communicating data; later this file will contain settings you have specified while using Graphics Terminal Emulator.

font101.tbl contains the stroke fonts which you can use to draw characters for presentation graphics.

Setting Environmental Parameters

To use the Graphics Terminal Emulator, you must export certain environmental parameters to the AIX Operating System. This can be done from the operating system, in either the “sh” or “csh” shell. Refer to the *IBM RT PC AIX Operating System Commands Reference* for a description of the “sh” and “csh” commands. The environmental commands can also be included in “.profile” (sh) or “.login” (csh) files which are executed each time a user logs in.

1. Set the VDIPATH parameter. This parameter provides a path to the directory where the IBM RT PC Graphics Development Toolkit device driver files reside. The installation procedure for the IBM RT PC Multi-User programs places the device driver files in **/usr/lpp/vdi/drivers**. VDIPATH is set as follows:

```
VDIPATH=/usr/lpp/vdi/drivers      (sh shell)
export VDIPATH
```

(or)

```
setenv VDIPATH /usr/lpp/vdi/drivers  (csh shell)
```

2. Logical Device Names must be assigned to the appropriate device driver file names. Graphics Terminal Emulator uses the following logical names for the devices on the Devices menu: DISPLAY, PRINTER, PLOTTER, METAFIL, and CAMERA. All of these devices are supported with the exception of CAMERA. The device driver files must be located in the directory specified by VDIPATH.

The logical device names are assigned as follows:

```
DISPLAY=display driver filename  (sh shell)
export DISPLAY
```

(or)

```
setenv DISPLAY driver filename  (csh shell)
```

```
PRINTER=printer driver filename      (sh shell)
export PRINTER
```

(or)

```
setenv PRINTER printer driver filename (csh shell)
```

```
PLOTTER=plotter driver filename      (sh shell)
export PLOTTER
```

(or)

```
setenv PLOTTER plotter driver filename (csh shell)
```

```
METAFIL=metafile driver filename     (sh shell)
export METAFIL
```

(or)

```
setenv METAFIL metafile driver filename (csh shell)
```

3. The device driver file names referenced in Step 2 must be assigned to the system's physical devices.

For example:

```
vdi5182=/dev/tty3                    (sh shell)
export vdi5182
```

(or)

```
setenv vdi5182 /dev/tty3              (csh shell)
```

Note: The **devices** program must be executed from the shell to establish tty ports for your graphics output devices. This program is native to the IBM AIX Operating System, but you must be a super-user to access it. The program prompts you for the required information. Refer to the *IBM RT PC Installing and Customizing the AIX Operating System* for information about how to run the devices program.

-
- If you select a printer, you may also want to pipe the output through the system's spooler. To do this, enter the following in place of step 3.

```
vdi5182='|print -plot lpn' (sh shell)
export vdi5182
```

(or)

```
setenv vdi5182 '|print -plot lpn' (csh shell)
```

where `lpn` is the printer device name.

- If you intend to send output to a plotter from a console display driver that is open, you must set a special environmental parameter called `MESSAGEPORT`. The `MESSAGEPORT` parameter may also be used to select a display device for the metafile “message” output.

The default for this parameter is `/dev/tty`. If you do not set this parameter to `/dev/hft`, prompts from the plotter (such as those to change paper and pens) will not appear on the console. The commands to set `MESSAGEPORT` are:

```
MESSAGEPORT=/dev/hft (sh shell)
export MESSAGEPORT
```

(or)

```
setenv MESSAGEPORT /dev/hft (csh shell)
```

- If you send output to Metafil (device driver file `vdimeta`), you may want to assign the output metafile file name to be used instead of the default, `METAFILE.DAT`.

The commands to do this are:

```
METAOUTPUT=filename (sh shell)
export METAOUTPUT
```

(or)

```
setenv METAOUTPUT filename (csh shell)
```

-
7. Graphics Terminal Emulator uses font files which are loaded by the installation procedures into **/usr/lpp/vdi/fonts**. You need to set the path to the fonts as follows:

```
FONTS=/usr/lpp/vdi/fonts (sh shell)
export FONTS
```

(or)

```
setenv FONTS /usr/lpp/vdi/fonts (csh shell)
```

If you do not set the **FONTS** environment parameter, Graphics Terminal Emulator will look for the font files in the current directory. The hardware text font will be used if the font files cannot be located.

8. Set the path for **terminal.env** and **terminal.etc** which are loaded by the installation procedures into **/usr/lpp/gterm/bin**. The path is set as follows:

```
TERMINAL=/usr/lpp/gterm/bin (sh shell)
export TERMINAL
```

(or)

```
setenv TERMINAL /usr/lpp/gterm/bin (csh shell)
```

If you do not set the **TERMINAL** environment parameter, Graphics Terminal Emulator will look for **terminal.env** and **terminal.etc** in the current directory.

9. Direct Graphics Terminal Emulator to the correct communications port. Identify the port you want to use with a command in this form:

```
TERMPORT=/dev/ttyxx (sh shell)
export TERMPORT
```

(or)

```
setenv TERMPORT /dev/ttyxx (csh shell)
```

Starting Graphics Terminal Emulator

Once Graphics Terminal Emulator is installed, type the following command after the system prompt:

```
terminal
```

and press **Enter**.

Appendix B. Error Messages and Codes

This appendix lists the error codes and messages returned by Graphics Terminal Emulator. Error messages returned by Graphics Terminal Emulator are displayed in the input focus area on the screen.

When running Graphics Terminal Emulator you may experience problems caused by the host system. See the error messages in the host system's user's guide for determining the problem.

Graphics Terminal Emulator Messages

Graphics Terminal Emulator returns the following error messages:

Cannot access .etc file:

Cause: The file containing the help messages and the icon descriptions could not be accessed.

Action: Make sure that the file **terminal.etc** is located in the directory path described in your **TERMINAL** environment setting. (See "Setting Environmental Parameters" in Appendix A, for a description of environment settings.)

Cannot close file:

Cause: The system is unable to close a file that has been opened for processing.

Action: Check that there is sufficient disk space to write the new file.

Cannot copy FD:

Cause: No room in file description table.

Action: Close all unnecessary files.

Cannot delete file:

Cause: File to be deleted was unavailable.

Action: Check that the directory path is correct, including that part specified by Change Directory. Check that you are asking for the correct file and that you have write permission for the file and the directory containing the file. The specified file may be in use.

Cannot disconnect from FD:

Cause: After completion of a file access operation, the system could not remove a file from its allocation table.

Action: Check that there are no unnecessary files open. Check that there is sufficient disk space remaining.

Cannot disconnect from old directory:

Cause: There are too many open files.

Action: Close all unnecessary files.

Cannot find that directory:

Cause: The requested directory could not be found or does not exist.

Action: Check that you are specifying the correct path.

Cannot get directory:

Cause: Directory list could not access the requested directory contents file.

Action: Check that the directory path is correct, including that specified by Change Directory. Check that you are asking for the correct directory and that you have read permission.

Cannot open file:

Cause: The system is unable to open a file while processing your request.

Action: Check that the file exists. Check that the correct directory path has been specified and that you have write permission.

Cannot open printer:

Cause: The system could not open the printer.

Action: Check that the connectors are secure. Check that the printer is online. Check that the port has read/write permission. Ensure that the correct environmental parameters are set to access the printer. See “Setting Environmental Parameters” in Appendix A for information about setting paths to graphics devices.

Cannot open that device:

Cause: The system was asked to open a device that was not found in the directory path specified by your VDIPATH environment variable, or was currently in use by another user. This happens most often when a graphics toggle (**F5**) is requested for an unavailable device driver. See “Setting Environmental Parameters” in Appendix A for information about the VDIPATH.

Action: Make sure that the correct device driver is available.

Cannot read file:

Cause: An error occurred while reading a file.

Action: Check that the disk is mounted and that you have read permission for the file in the requested directory.

Cannot rename file:

Cause: Old filename cannot be renamed to new filename.

Action: Check that the directory path, including the default established by Change directory, is correct. Check that the disk is mounted and that you have write permission in the requested directory.

Communications hardware not present:

Cause: The variable used to request the device is not present or not available in your TERMPORT environment. See “Setting Environmental Parameters” in Appendix A for a description of environment settings.

Action: Check that TERMPORT is set to the correct communication port; check that the port is clear, has read/write permission, and is available.

Error closing download file:

Cause: After a download operation, the system could not close the destination file.

Action: Check that the disk with the destination file is mounted. Check that the correct directory path has been specified, and that there is sufficient space on the disk.

Error closing printer:

Cause: The system cannot close the printer at the end of a printing operation.

Action: Check that the connectors are secure. Check that the printer is online.

Error closing upload file:

Cause: An error occurred while trying to close the file that was being uploaded.

Action: Check that the disk is mounted.

Error copying file:

Cause: An error occurred while copying a file.

Action: Check that there is sufficient disk space for the new file. Check that the requested directory paths are correct, and that you have read permission.

Error opening .env file:

Cause: The system could not open a save file for the current environment.

Action: Check that the disk is mounted. Check that you have write permission to the directory. Check that the correct directory path is specified in the `TERMINAL` environment variable. See “Setting Environmental Parameters” in Appendix A for information about setting environment variables.

Error reading .env file:

Cause: An error occurred while reading the file **terminal.env**. The default parameters will be used.

Action: Check that the disk containing the file **terminal.env** is mounted. If it is, **terminal.env** is damaged. Delete it and restart Graphics Terminal Emulator. A new **terminal.env** will be created in the directory specified in the **TERMINAL** environment variable. If **TERMINAL** has not been specified, the file will be created in the current directory. The new file will contain default values.

Error reading upload file:

Cause: An error occurred while reading a file during an upload operation.

Action: Check that the disk is mounted.

Error writing download file:

Cause: While downloading, an error occurred writing to the destination file.

Action: Check that the disk with the destination file is mounted. Check that the correct directory path has been specified.

Error writing .env file:

Cause: An error occurred while trying to write the current environment to the environmental save file.

Action: Check that the disk containing the file **terminal.env** is mounted. If it is, **terminal.env** is damaged. Delete it and restart Graphics Terminal Emulator. A new **terminal.env** will be created in the directory specified in the **TERMINAL** environment variable. If **TERMINAL** has not been specified, the file will be created in the current directory. The new file will contain default values.

File not found:

Cause: The file to be opened was not found by the file open routine.

Action: Check that the correct directory path is specified. Check that the disk is mounted.

File not completely sent:

Cause: The upload operation was stopped before the end of the file was reached.

Action: Check that transmission was interrupted intentionally. If not, repeat the upload operation.

Invalid TERMINAL directory:

Cause: The directory specified by the TERMINAL environment variable was incorrect.

Action: Check that the directory path specified by the TERMINAL environment variable is correct, that the disk is mounted, and that you have read and write permission to that directory. (See “Setting Environment Parameters” in Appendix A for information about environment variables.)

Memory allocation failure:

Cause: A request for allocation of memory has been denied. There is less memory than required.

Action: Install additional memory in your computer or increase the size of the paging area.

Must enter a file name:

Cause: The system requests that a file name be entered.

Action: Enter a valid file name. If you are unsure of a file name, or its existence, use the local commands for more information.

Must enter a path name:

Cause: The system requests that a valid pathname be entered.

Action: Enter a valid pathname.

No .env file; defaults used:

Cause: The file **terminal.env** was not available at startup. The internal default parameters will be used.

Action: A new **terminal.env** will be created in the directory specified in the **TERMINAL** environment variable. If **TERMINAL** has not been specified, the file will be created in the current directory. The new file will contain default values.

Printing error:

Cause: An error occurred while sending data to the printer.

Action: Check that the connectors are secure. Check that the printer is online.

Versions differ; .env ignored:

Cause: The system was told to access a version of the file **terminal.env** that was made by a previous version of itself. The internal default parameters are used.

Action: A new **terminal.env** will be created in the directory specified in the **TERMINAL** environment variable. If **TERMINAL** has not been specified, the file will be created in the current directory. The new file will contain default values.

Appendix C. Sample Graphics Terminal Emulator Sessions

This section provides sample terminal sessions to illustrate some of the applications of Graphics Terminal Emulator. Before attempting any of the operations, you must have the required host-dependent information which is specified by the questions listed before the sample sessions.

Suppose you are a member of an Engineering Department and want to connect your computer to the computer in the Administration Department in order to download data to your computer. Next, you want to run a graphics application program that is available only on the Administration Department's computer.

While receiving your password and logon instructions for the Administration Department computer, you should ask your department's data processing manager the following questions:

What is the baud rate of the computer line installed in my office?

What kind of parity does the Administration Department computer use?

How many stop bits and data bits does the Administration Department computer use?

What kind of flagging (handshaking) is used by the Administration Department's computer?

Does my computer have a port to connect to the Administration Department's computer? The variable describing this port must be specified in the TERMPORT environment variable.

Which controls echoing characters – my terminal or the Administration Department computer?

To which options are CR Implies and LF Implies set?

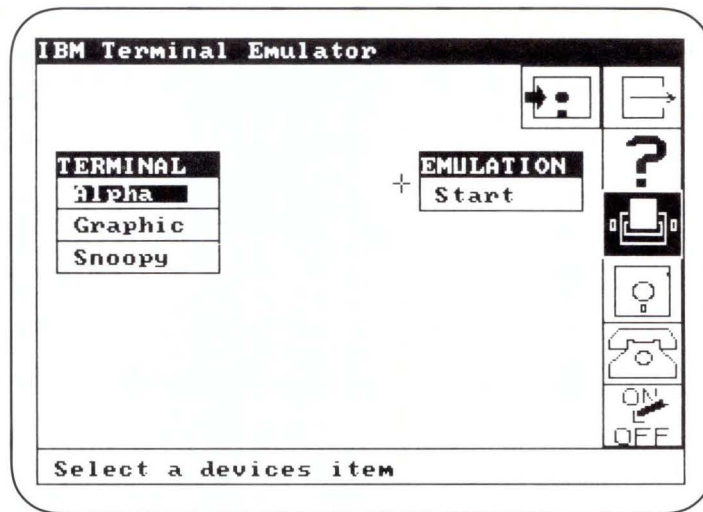
The answers to these questions will help you to configure the Graphics Terminal Emulator protocol correctly.

Example 1: Logging On to a Host Computer

The first sample session describes the procedure for logging on to a host computer.

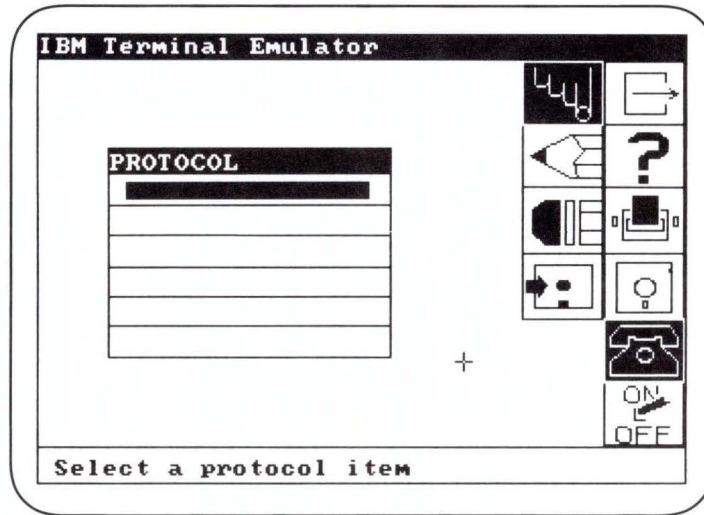
1. To start Graphics Terminal Emulator, type the following command after the system prompt:

```
terminal
```



Because the *Alpha* option in the Terminal Menu is highlighted, Graphics Terminal Emulator is expecting alphanumeric input. (Either Graphics Terminal Emulator *remembered* this setting from its last session, or this is the initial use of the program.)

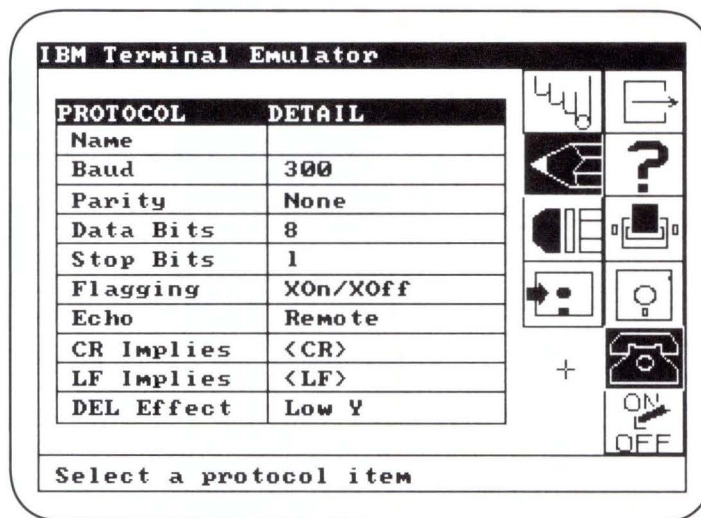
-
2. Select the Protocol icon. Graphics Terminal Emulator displays all the currently defined protocol configurations.



Since you have never communicated with the Administration Department computer before, an appropriate protocol configuration does not exist.

3. Using the keyboard arrow keys or the input device, move the graphics cursor to a blank space in the Protocol Menu. Press **Enter** or an input device button. Now select the Write icon to indicate that you want to define a new protocol configuration.

4. Graphics Terminal Emulator displays the Protocol Detail Menu with default values assigned to the parameters.



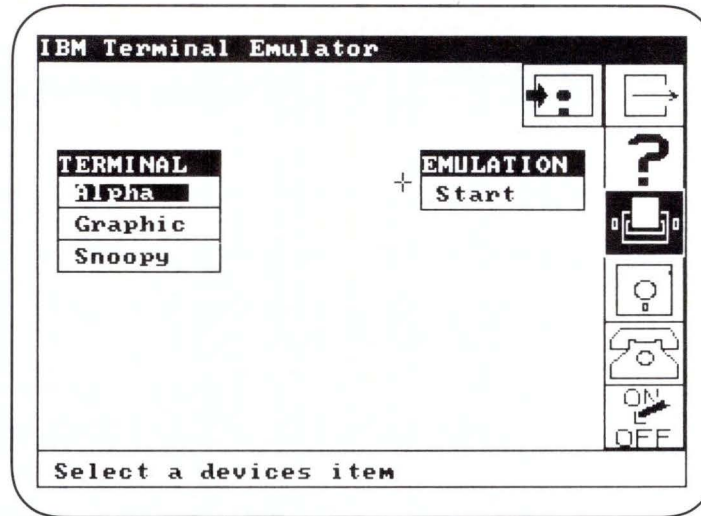
You need to change these default values to match the requirements of the Administration Department computer.

5. First, select the *Name* parameter. Graphics Terminal Emulator prompts you in the input focus area to specify a new name for the protocol. Enter

Admin

6. Change the values for *Baud*, *Parity*, *Data Bits*, *Stop Bits*, *Flagging*, *CR Implies*, *LF Implies*, and *Echo* as directed by the Administration Department's data processing manager.

-
7. Now select the Devices icon to return to the Home Screen.



8. Select the *Start* option in the Emulation Menu. Graphics Terminal Emulator automatically connects you with the Administration Department computer. The message

Select F9 to return to menu

appears.

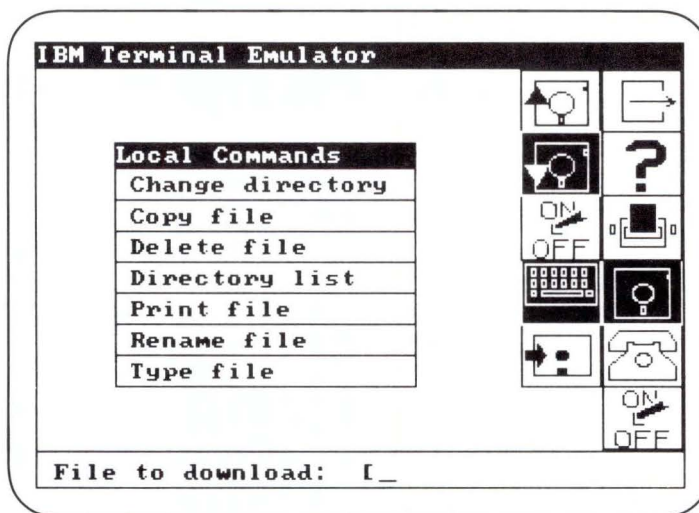
9. Log on to the host computer using logon information you obtained from the data processing manager.

Example 2: Downloading a Data File

Suppose you have just logged on to a host computer, as described in Example 1. Graphics Terminal Emulator interacts with your computer as with any other online terminal.

You now want to download a data file from the host computer to your computer.

1. Press the **F9** key; this activates the exit function.
2. Select the Storage primary function icon. On the Storage Screen, select the Download subfunction icon.



3. Graphics Terminal Emulator asks for the name of the file to receive the information downloaded from the Administration Department computer. Type the name

`storage.txt`

then press **Enter**.

-
4. Graphics Terminal Emulator clears the screen and displays the message,

```
Connected to host
```

indicating that you are interacting with the host computer.

5. Type the appropriate command(s) to prepare the Administration Department computer to send the file. (These commands are supplied by the data processing manager, or refer to the host computer user's manual.) If the host has an operating system such as the IBM RT PC AIX Operating System, the command is:

```
cat filename
```

6. Pressing **F9** displays the message

```
Type last character.
```

Graphics Terminal Emulator waits to receive the downloaded data. To begin the actual downloading operation, press **Enter** (or other termination character) to complete the current command. The host computer then executes the current command.

7. As data fills **storage.txt** on your computer, Graphics Terminal Emulator displays (after the *Receiving* prompt) the first few characters of each file line downloaded. When the file has been received, Graphics Terminal Emulator displays the last line received from the host computer; that is, the host computer's prompt. The last downloaded line is not copied to the download file.
8. When downloading is complete, press the **F9** key. Graphics Terminal Emulator closes the file on your computer. The Storage Screen reappears. The following message reappears:

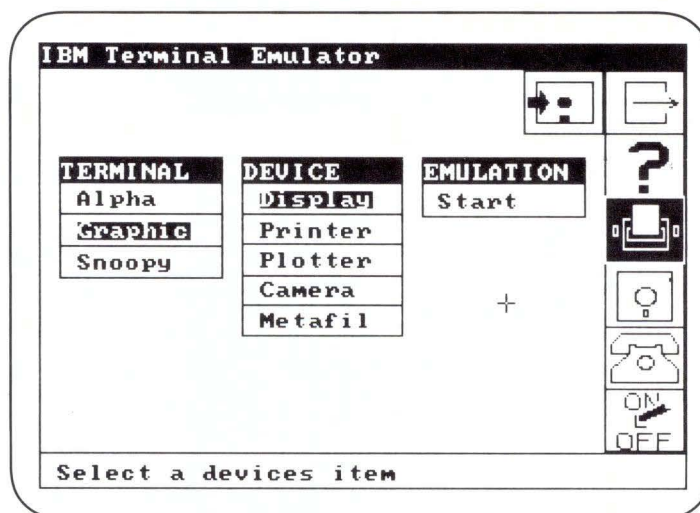
```
Connected to host.
```

To return to the Storage screen, press **Enter** again.

Example 3: Running a Graphics Program

Assume that you have connected your computer to a host computer, as described in Example 1, and that you have downloaded a data file, as described in Example 2. You now want to run a graphics application program to direct charts to your display device and plotter. Assume that Graphics Terminal Emulator is displaying the Storage Screen.

1. Select the Devices icon to return to the Home Screen.



Select *Graphic* from the Terminal Menu. Choose *Start* from the Emulation Menu.

2. You are again connected to the Administration computer. Enter the command to execute the chart generation program—for example, *monthly charts*. Press **Enter** (or other termination character). The host computer draws the charts on the screen. Press **F9** to activate the exit function.
3. To draw the charts on your plotter, choose *Plotter* from the Device Menu. Then select *Start* from the Emulation Menu.
4. Though you have chosen *Plotter* from the output window, Graphics Terminal Emulator continues to send graphics output to your display device until you press the **F5**; this activates the graphics toggle.

-
5. Type the command that runs the chart generation program *monthly charts*. Then press **F5**; this activates the graphics toggle. Graphics Terminal Emulator directs all graphics output to your plotter.
 6. Press **Enter** to end the *monthly charts* command. When the output has finished printing on the plotter, press **F5**. (Your display device again becomes the graphics output device.)
 7. Log off the Administration computer. Press **F9** to return to Graphics Terminal Emulator. Select the Exit icon to exit Graphics Terminal Emulator and return to the operating system.



Appendix D. Function Key Assignments and Default Values

Appendix D contains the values for the function keys, default switch settings, and default protocol parameters.

Function Key Assignments

The following function keys perform various tasks associated with special keys on graphics and alphanumeric terminals.

F1 Page

Clears the display screen and places the cursor in its home position. Use this key to eliminate all previous screen contents before receiving graphics output at your computer. (Applies to both graphic and alphanumeric terminals.)

F2 Hardcopy

Causes graphics output on the display of your computer to be copied to a graphics printer. (Applies to graphic and alphanumeric terminal emulation, but operates in a device-dependent fashion.)

F3 Reset

Recalculates the aspect ratio and sets all switches that were active when you entered emulation mode. (Applies only to graphic terminal emulation.)

F4 Local/Line Toggle

Enables you to switch between local and online modes. This toggle is set to the online mode each time you start Graphics Terminal Emulator from the operating system. (Applies to both graphic and alphanumeric terminal emulation.)

F5	Graphics Toggle	Changes the device for graphics output. You alternate between your computer monitor and an alternate device each time you press this key. Initially, the graphics toggle is set to send graphics output to the computer monitor. (Applies only to graphic terminal emulation.)
F6	Release	Releases the screen after a Page Full Wait condition. (Applies only to graphic terminal emulation.)
F7	Margin Toggle	Enables you to switch between one-margin mode and two-margin mode. Tektronix terminals can run in both modes. The margin toggle is set to one-margin mode each time you start Graphics Terminal Emulator. (Applies only to graphic terminal emulation.)
F8	not used	
F9	Screen Toggle	Returns you to the Graphics Terminal Emulator home screen. (Applies to both graphic and alphanumeric terminal emulation.)
F10	Break	Sends a break instruction (lasting 500 milliseconds) to the host computer. Some hosts stop command execution upon receipt of a break instruction. (Applies to both graphic and alphanumeric terminal emulation, but operates in a host-dependent fashion).

Default Values for Switch Settings

Setting	Default Value
Alpha autowrap	On
Character type	Hardware
GIN terminator	<CR>
Aspect ratio	Graphic
Character spacing	Native
Page Full Break	Off
Page Full Hardcopy	Off
Page Full Page	Off
Page Full Wait	Off

Default Values for Protocol Parameters

Parameter	Default Value
Name	Blank
Baud	300
Parity	None
Databits	8
Stopbits	1
Flagging	XOn/XOff
Echo	Remote
CR implies	<CR>
LF implies	<LF>
DEL effect	Low Y

Appendix E. Expanded Emulation Functions

Appendix E lists terminal commands supported by Graphics Terminal Emulator for the ADM-3A terminal as well as the supported functions of the Tektronix 4014 terminal with Extended Graphics Module and the Tektronix 4105.

ADM-3A Commands

The following table lists the ADM-3A commands available through Graphics Terminal Emulator.

ASCII Character	Hex Code	Description
BEL	07	Rings bell
BS	08	Backspaces. (Cursor moves nondestructively to the left, but does not wrap around at the left margin.)
LF	0A	Performs line feed. (Cursor moves down one line and text scrolls up one line at the bottom.)
VT	0B	Performs vertical tab. (Cursor moves up one line and is pinned at the top of the screen.)
FF	0C	Performs form feed. (Cursor moves nondestructively to the right.)

ASCII Character	Hex Code	Description
CR	0D	Performs carriage return. (Cursor moves to the left margin.)
SUB	1A	Clears screen.
ESC	1B	Begins an escape sequence.
RS	1E	Returns cursor to home position.
ESC + G	47	Toggles reverse video.
ESC + T	54	Erases from current position to the end of the line.
ESC + Y	59	Erases from current position to the end of the screen.
ESC + (28	Restores bold intensity.
ESC +)	29	Restores normal intensity.
ESC = <row> <col>		Positions cursor at the row and column specified. The values for <row> are ASCII decimal equivalents (ADE) in the range from 32 to 55. The values for <col> are in the range from ADE 32 to ADE 111.

Tektronix 4014 and 4105 Features

The Graphics Terminal Emulator allows you to emulate most functions of the Tektronix 4014 graphics terminal with Extended Graphics Module (EGM), and selected features of the Tektronix 4105.

Graphics Terminal Emulator provides the following 4014 compatible modes:

- Alpha mode
- Vector mode
- Graphic input (GIN) mode.

Alpha Mode

When Graphics Terminal Emulator acts as a 4014 terminal, the initial emulation mode is alpha mode. The cursor is positioned in the upper-left corner of the screen. Characters sent from the host are displayed using the native character spacing of your computer. You select alpha mode in one of the following ways:

- At initialization
- <CR>
- ESC + FF character sequence
- US character (except from GIN mode)
- PAGE function key from keyboard
- RESET function key from keyboard.

While in alpha mode, Graphics Terminal Emulator displays characters sent as ASCII codes and also recognizes the following formatting commands:

- ESC + FF returns the cursor to home position and erases the screen.
- <CR> returns the cursor to the left margin.
- <LF> moves the cursor down one line.
- HT moves the cursor right one space.
- BS moves the cursor left one space.
- VT moves the cursor up one line.

Vector Mode

In vector mode, codes sent from the host are interpreted as the X, Y coordinates (4096 resolution) of the endpoints of vectors. You select vector mode with the GS command. Graphics Terminal Emulator moves to the first X, Y coordinate pair received after a GS command. Subsequent X, Y coordinate pairs result in Graphics Terminal Emulator drawing between points, forming contiguous series of line segments. A subsequent GS command causes the cursor to move to a new point.

While in vector mode, Graphics Terminal Emulator recognizes the following commands:

- ESC + FF selects alpha mode, returns the cursor to home position, and erases the screen.
- US selects alpha mode, but leaves the cursor at the last position.
- ESC + SUB selects GIN mode and displays the graphics cursor.
- An escorted <CR>, that is <ESC><CR><LF><SYN>, does not interrupt the flow of vector data.
- An unescorted <CR>, one that is not preceded with a <ESC>, selects alpha mode and returns the cursor to the left margin.

Vector mode also supports these line styles by preceding the character with an <ESC>:

char	Line Style
	Solid (The character here is a space.)
a	Dotted
b	Dashed-dotted
c	Medium dashed
d	Long dashed
e	Solid
f	Solid
g	Solid
h	Solid
i	Dotted
j	Dash-dotted
k	Medium dashed
l	Long dashed
m	Solid
n	Solid
o	Solid
p	Solid
q	Dotted
r	Dash-dotted
s	Medium dashed
t	Long dashed
u	Solid
v	Solid
w	Solid

Two keys have specific functions in vector mode:

- PAGE selects alpha mode, returns the cursor to home position, and erases the screen.
- RESET selects alpha mode, returns the cursor to home position, and selects the largest 4014 character size.

GIN Mode

In GIN (Graphics Input) mode, Graphics Terminal Emulator enables the host to determine the current position of the alpha and graphics cursor. You can also select a point on the screen and send its coordinates to the host. An ESC + SUB command from the host displays the graphics cursor on the screen. After positioning the graphics cursor, you can transmit the current cursor coordinates.

To terminate GIN mode, use any of the following sequences:

- Press the **Enter** key
- PAGE (also erases the screen)
- RESET (also returns the cursor to home position)
- Press any ASCII character key.

While in GIN mode, Graphics Terminal Emulator prevents data from the host from appearing on the screen.

Graphics Terminal Emulator does not support the following modes available in Extended Graphics Module (EGM) operation:

- Point plot mode
- Incremental point plot mode
- Special point plot mode.

4105 Command Parameters

Graphics Terminal Emulator enables you to use the 4105 commands described later in this appendix. In the format for these commands, the following standard parameters appear. These parameters have the same function and characteristics in all commands that call for them.

Element	Description
<code><x,y></code>	An X, Y coordinate pair encoded for transmission to the terminal. The X and Y coordinates in the <code><x,y></code> parameter are integers in the range 0 to 4095.
<code><int></code>	Integers are sent to the terminal as <code><int></code> parameters. <code><int></code> parameters represent signed integers in the range from -32768 to +32767.
<code><int+></code>	Integers are sent to the terminal as <code><int+></code> parameters. <code><int+></code> parameters represent unsigned integers from 0 to +65535.
<code><int-array></code>	An array of integers telling how many items are in the array, followed by <code><int></code> parameters for each item in the array.
<code><string></code>	A <code><string></code> consists of an <code><int></code> parameter telling how many characters are in the string, followed by <code><char></code> parameters for each of the characters.
<code><char></code>	Individual ASCII characters represented as ASCII decimal equivalents in the range from 32 to 126. These decimal equivalents represent the displayable ASCII characters from SP to <code>~</code> .

On the following pages, the standard parameters are given in the format, along with a keyword describing the purpose of the parameter. For example, the notation:

`<int:boundary>`

indicates that you provide an integer to define the type of boundary you require.

For some commands, one or more default values are provided. There are three kinds of default values for 4105 commands:

- Factory
- Power-up
- Omitted.

Factory defaults are those in effect at the start of emulation or when the computer is reset. Power-up defaults are remembered by Graphics Terminal Emulator from session to session. Omitted defaults are the values Graphics Terminal Emulator assumes if you do not provide values for all command parameters.

4105 Commands

The following describes the Tektronix 4105 commands supported by Graphics Terminal Emulator:

Begin Panel Boundary:

Format: <ESC>LP<x,y:firstpoint>, <int:boundary>

This command starts a panel definition. <x,y:firstpoint> is a pair of integers specifying the first boundary point. <int:boundary> is the integer 0 (which directs the program to draw the boundary in the finished panel) or 1 (which directs the program to omit the boundary in the finished panel).

Defaults: <x,y:firstpoint>: Omitted=0,0

 <int:boundary>: Omitted=0

Draw:

Format: <ESC>LG<x,y:location>

This command draws a vector from the current position to the specified location. <x,y:location> is a pair of integers specifying the coordinates of the destination point.

Defaults: <x,y:location>: Omitted=0,0

Draw Marker:

Format: <ESC>LH<x,y:marker>

This command draws a marker at the specified location. <x,y:marker> is a pair of integers specifying the coordinates of the marker point.

Defaults: <x,y:marker>: Omitted=0,0

End Panel:

Format: <ESC>LE

This command draws the last side of the current panel and terminates the panel definition.

Graphic Text:

Format: <ESC>LT<string>

This command writes a string of graphic text starting at the current position. <string> is a character sequence to be drawn.

Defaults: <string>: Omitted=empty string

Hardcopy:

Format: <ESC>KH<int:code>

This command causes an attached hardcopy device to make a copy of the screen. <int:code>, if specified, is ignored.

Defaults: <int:code>: Omitted=0

Move:

Format: <ESC>LF<x,y:location>

This command sets the current graphics position without drawing a vector. <x,y:location> is a pair of integers specifying the destination point.

Defaults: <x,y:location>: Omitted=0,0

Select Code:

Format: <ESC>%!<int:mode>

This command causes the terminal to recognize Tektronix or ADM-3A syntax, enabling a program on a host computer to switch between alphanumeric and graphic terminal emulation. <int:mode> can be 0 for Tektronix or 4 for ADM-3A.

Defaults: <int:mode>: Omitted=0

Select Fill Pattern:

Format: <ESC>MP<int:fill>

This command specifies the fill pattern for subsequent panels. <int:fill> is an integer from -7 to +174. Graphics Terminal Emulator uses <int:fill> to determine color, patterns or hatching, and style. If <int:fill> is negative, Graphics Terminal Emulator uses the absolute value of <int:fill> to determine color and chooses a solid panel fill. If <int:fill> is positive or zero (zero is automatically set to 1), Graphics Terminal Emulator uses three formulas for generating the fill pattern.

In the formulas below, m represents the number of patterns supported by your display device driver. The value for k represents the number of hatchings and x represents <int:fill>.

The formula for computing the index is:

$$\text{color-index} = x / (m + k)$$

The formula for computing the pattern/hatching index sent to is:

$$\text{pattern-index} = \text{modulus of } x / (m + k)$$

Hatching is chosen if the pattern-index is greater than m.

Pattern is chosen if the pattern-index is less than or equal to m.

The formula for computing the style index is:

$$\text{style-index} = \text{modulus of } x / (m + k)$$

If the style-index is less than m, the style-index as computed is chosen. If the style-index is greater than or equal to m, m is subtracted from the style-index and the result is used.

Note: Various devices have limits on the values they recognize. If a computed index is out of range for a particular device, the largest index available on that device is chosen.

Defaults: <int:fill>: Factory = -1
 Power-up = -1
 Omitted = 0

Set Graphics Area Writing Mode:

Format: <ESC>MG<int:mode>

This command specifies whether the terminal overwrites or replaces alphanumeric text in the graphics area. <int:mode> is 0 for replace or 1 for overstrike. All other values are set to 0 (replace). Plotters do not support replace mode.

Defaults: <int:mode>: Factory = 1
 Power-up = remembered
 Omitted = 0

Set Graphtext Rotation:

Format: <ESC>MR<int:mantissa>, <int:power-of-2>

This command sets the rotation angle for graphic text. <int:mantissa> is the number of degrees of rotation: 0, 90, 180, or 270. (If it is not one of these values, the supplied angle is rounded up to the nearest multiple of 90.) <int:power-of-2> should be set to 0.

Defaults: <int:mantissa>: Factory =0
 Power-up=0
 Omitted =0

Set Graphtext Size:

Format: <ESC>MC<int:unused>, <int:height>, <int:unused>

This command sets the size of graphic text. <int:height> is an integer from 1 to 4095. <int:unused> is a placeholder parameter, required for Tektronix compatibility. Graphics Terminal Emulator assumes that <int:height> is expressed in 4 KB space and then transforms the value in 32 KB space. Zero is set automatically to 1.

Defaults: <int:height>: Factory =61
 Power-up=61
 Omitted =default for current driver

Set Line Index:

Format: <ESC>ML<int:index>

This command specifies the color index for all subsequent lines, panel boundaries, and markers. <int:index> is an integer from 0 to 32767. <int:index> passes to Graphics Terminal Emulator, which tries to match the value. If the value is out of range, the largest index the device can support is assumed.

Defaults: <int:index>: Factory =1
 Power-up=1
 Omitted =0

Set Line Style:

Format: <ESC>MV<int:style>

This command specifies a line style for all subsequent lines and panel boundaries. <int:style> is an integer from 0 to 5.

0=Solid
1=Dotted
2=Dash and Dot
3=Medium Dash
4=Long Dash
5=Dash and Two Dots

If <int:style> is not one of the values, Graphics Terminal Emulator assumes a solid line style.

Defaults: <int:style>: Factory =0
 Power-up=0
 Omitted =0

Set Marker Type:

Format: <ESC>MM<int:marker>

This command specifies the kind of marker to be drawn. <int:marker> is an integer from 0 to 10. If <int:marker> is not one of these values, Graphics Terminal Emulator changes the value to 3 (an asterisk). When you change marker types, any marker already displayed stays the same. This command affects only subsequent markers drawn.

Defaults: <int:marker>: Factory =0
 Power-up=0
 Omitted =0

Set Surface Color Map:

Format: <ESC>TG<int:surface>, <int-array:color-mix>

This command specifies the color assigned to one or more color indices in the graphics area. The <int:surface> must be set to 1. The <int-array> consists of four values: index, hue, lightness, and saturation. Index is an integer from 0 to 7. Hue is an integer from 0 to 366. Lightness is an integer from 0 to 100. Saturation is an integer from 0 to 100.

The values for hue, lightness, and saturation are mapped into RGB (red-green-blue) value, using the algorithm presented by J. Foley and A. Van Dam in *Fundamentals of Interactive Computer Graphics* (Reading, Ma: Addison-Wesley, 1983). Graphics Terminal Emulator honors two indices for the device: the background and foreground colors. If the color index is out of range, the largest index supported by the device is assumed. If you request a color intensity less than 0, Graphics Terminal Emulator assumes 0. If you request a color intensity greater than 1000, Graphics Terminal Emulator assumes 1000.

Defaults: <int-array:color-mix>: Factory =1,0,0,0
 Power-up=remembered
 Omitted =default for current driver

Set Text Index:

Format: <ESC>MT<int:index>

This command specifies the color index for graphic text. The <int:index> is an integer from 0 to 7. If the value is out of range, the largest index the device can support is assumed.

Defaults: <int:index>: Factory =1
 Power-up=1
 Omitted =0

Set View Attributes:

Format: <ESC>RA<int:surface>, <int:background>, <int:unused>

This command sets the background color for the graphics area. The <int:surface> is the integer -1 or 1. The <int:background> is an integer from 0 to 7. The <int:unused> is a place-holding parameter required for Tektronix compatibility. Terminal Emulator ignores the value for <int:surface>. If the value you supply for <int:background> is not valid, the background color does not change.

Note: Some devices do not change colors until you press the function key that activates the page function (**F9**).

Defaults: <int:surface>: Factory = 1
 Power-up= 1
 Omitted =default for current driver

<int:background>: Factory =0
 Power-up=0
 Omitted =default for current driver

Appendix F. ASCII Character and Control Codes

The following table of ASCII characters is provided for your reference as a programming aid.

ASCII Character	Character Name	Decimal Code	Hexadecimal Code
NUL	Null	00	00
SOH	Start of Heading (^A)	01	01
STX	Start of Text (^B)	02	02
ETX	End of Text (^C)	03	03
EOT	End of Transmission (^D)	04	04
ENQ	Enquiry (^E)	05	05
ACK	Acknowledge (^F)	06	06
BEL	Bell (^G)	07	07
BS	Backspace (^H)	08	08
HT	Horizontal Tab (^I)	09	09
LF	Line Feed (^J)	10	0A
VT	Vertical Tab (^K)	11	0B
FF	Form Feed (^L)	12	0C
CR	Carriage Return (^M)	13	0D
SO	Shift Out (^N)	14	0E
SI	Shift In (^O)	15	0F
DLE	Data Link Escape (^P)	16	10
DC1	Device Control-1 (^Q)	17	11
DC2	Device Control-2 (^R)	18	12
DC3	Device Control-3 (^S)	19	13

ASCII Character	Character Name	Decimal Code	Hexadecimal Code
DC4	Device Control-4 (^T)	20	14
NAK	Negative Acknowledge (^U)	21	15
SYN	Synchronous Idle (^V)	22	16
ETB	End of Transmission Block (^W)	23	17
CAN	Cancel (^X)	24	18
EM	End of Medium (^Y)	25	19
SUB	Substitute (^Z)	26	1A
ESC	Escape	27	1B
FS	File Separator (^\\)	28	1C
GS	Group Separator (^])	29	1D
RS	Record Separator (^↑)	30	1E
US	Unit Separator (^←)	31	1F
SP	Space, Blank	32	20
!	Exclamation Point	33	21
"	Quotation Mark	34	22
#	Number Sign, Hatch	35	23
\$	Dollar Sign	36	24
%	Percent Sign	37	25
&	Ampersand	38	26
'	Apostrophe	39	27
(Left Parenthesis	40	28
)	Right Parenthesis	41	29
*	Asterisk	42	2A
+	Plus Sign	43	2B
,	Comma	44	2C

ASCII Character	Character Name	Decimal Code	Hexadecimal Code
-	Hyphen	45	2D
.	Period	46	2E
/	Slash	47	2F
0	Zero	48	30
1		49	31
2		50	32
3		51	33
4		52	34
5		53	35
6		54	36
7		55	37
8		56	38
9		57	39
:	Colon	58	3A
;	Semicolon	59	3B
<	Less Than	60	3C
=	Equal Sign	61	3D
>	Greater Than	62	3E
?	Question Mark	63	3F
@	At Sign	64	40
A		65	41
B		66	42
C		67	43
D		68	44
E		69	45
F		70	46

ASCII Character	Character Name	Decimal Code	Hexadecimal Code
G		71	47
H		72	48
I		73	49
J		74	4A
K		75	4B
L		76	4C
M		77	4D
N		78	4E
O		79	4F
P		80	50
Q		81	51
R		82	52
S		83	53
T		84	54
U		85	55
V		86	56
W		87	57
X		88	58
Y		89	59
Z		90	5A
[Left Bracket	91	5B
\	Reverse Slash	92	5C
]	Right Bracket	93	5D
^	Caret	94	5E
_	Underscore	95	5F
`	Accent Grave	96	60

ASCII Character	Character Name	Decimal Code	Hexadecimal Code
a		97	61
b		98	62
c		99	63
d		100	64
e		101	65
f		102	66
g		103	67
h		104	68
i		105	69
j		106	6A
k		107	6B
l		108	6C
m		109	6D
n		110	6E
o		111	6F
p		112	70
q		113	71
r		114	72
s		115	73
t		116	74
u		117	75
v		118	76
w		119	77
x		120	78
y		121	79
z		122	7A

ASCII Character	Character Name	Decimal Code	Hexadecimal Code
{	Left Brace	123	7B
	Vertical Bar	124	7C
}	Right Brace	125	7D
~	Tilde	126	7E
DEL	Delete or Rub Out	127	7F

Glossary

alpha cursor. A cursor which marks the next character position where you enter alphanumeric data.

aspect ratio. On a graphics terminal, the ratio of the width of a display to its height.

baud rate. The speed at which information is transmitted between your computer and a host computer. Some standard rates are 110, 300, and 1200 baud. Other rates are also possible. Some computers can transmit at only one rate; others can be set to a variety of rates.

break. A function key (**F10**) you press to stop execution of a command on some host computers. In Graphics Terminal Emulator, the break condition lasts for 500 milliseconds.

configuration. The tailoring of the Graphics Terminal Emulator to perform with your host system and personal computer environment. You decide, through a series of menus, what options you need.

control character. A non-printable character, such as carriage return, backspace, or bell, that controls an output device operation.

cursor. A position-marker character you move around the screen to select a function or menu option, or to enter text.

default. The automatic selection that Graphics Terminal Emulator makes if you do not indicate otherwise. For example, the default output device is the display screen.

DEL Character. A control character (decimal 127) that, on Tektronix graphics terminals, can be either ignored or accepted; if accepted, the terminal uses it to determine part of the Y coordinate. Also used by some host systems as the break character.

downloading. The transfer of information from a host computer to your computer.

echoing. A communication protocol parameter that determines whether all characters sent from your computer to a host computer are displayed at your graphics display device or on a printer. You assign the echoing function to Graphics Terminal Emulator or to the host computer using the Protocol icon.

emulate. The combination of programming techniques and special hardware features that permit one computer terminal to act as another.

exit. A function key (**F9**) you press to return to Graphics Terminal Emulator.

file. A collection of related information recorded on a diskette or a fixed disk. The operating system determines how files are managed. Although a file may consist of many bytes of data residing in many disk tracks and sectors, a single filename identifies the entire file.

flagging. A communication protocol parameter that you set by selecting the Protocol icon in Graphics Terminal Emulator.

function area. The area on the screen where icons representing Graphics Terminal Emulator functions appear.

GIN (Graphics Input) Terminator. A sequence of characters sent from Graphics Terminal Emulator to the host computer to signify the end of graphics input mode. The GIN terminator is preceded by other characters that describe the location of the cursor at the time of termination and the actual character entered to cause termination.

graphics cursor. A cursor in the shape of a crosshair or plus sign (+) that you use to select icons and menu options.

graphics toggle. A function key (**F5**) you press to select an alternate output device. The output device can be either the graphics display device or another device (such as a plotter or printer).

handshaking. The exchange of established codes to ensure proper connection and synchronization between your computer and a host computer.

hardcopy device. A device for printing or plotting output on a piece of paper.

host computer. The primary, or controlling, computer in a multiple computer installation.

icon. A graphics symbol that represents a function Graphics Terminal Emulator can perform. To select the function, move the graphics cursor until it is within the icon and then press **Enter** on the keyboard or a button on the input device.

input focus area. The last text line on the Graphics Terminal Emulator screen, used to display prompts and messages and to enter data.

margin. A characteristic of Tektronix 4014 emulation, whereby you can switch between one- and two-margin operation. On high resolution output devices, you can use two columns for text display. The two-margin feature is useful because there is no scrolling in 4014 emulation.

menu. A display, or list, of available options for your selection.

metafile. A file of binary characters produced by a special output driver. The file contains a symbolic representation of a graphics image. A special graphics utility is then needed to translate the stored file into a graph or image. In Graphics Terminal Emulator, the metafile has the default name METAFILE.DAT. You can change this name using the Rename file command available through the Storage icon or by setting the environment variable, METAOUTPUT.

Page Full. In Tektronix terminal emulation, the state that occurs when a line feed character is encountered but the screen is already full. Various switches enable you to break, print a hardcopy, clear the screen, or wait for user input before continuing. Page Full is dependent on the margin setting. See **margin**.

parity. In data communications, a system for selectively using a single bit of each character transmitted between your computer and a host computer to check for an error in the communication of the character. Use of parity bits is controlled by a communications protocol parameter and must be set to match the parity setting of the host computer. Set the parity by selecting the Protocol icon in Graphics Terminal Emulator.

protocol. The set of communications parameters that controls how information is transmitted between your computer and a host computer. Communications protocols include baud rate, number of stop bits, parity, flagging, and echo.

stop bit. A bit added to the end of a character transmitted between your computer and a host computer to indicate the end of the character. Addition of stop bits to characters is controlled by a communication protocol parameter. Select this parameter with the Protocol icon in Graphics Terminal Emulator.

window. The area on the Graphics Terminal Emulator screen where parameters that apply to a function icon are displayed.

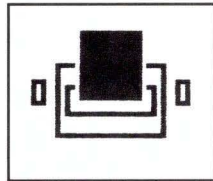
uploading. The transfer of information from your computer to a host computer.

XOn/XOff. A type of handshaking available in Graphics Terminal Emulator. When the receiving buffer is filled, Graphics Terminal Emulator sends out an XOff character (Device Control-3). The host computer stops transmitting until it receives the XOn character (Device Control-1).

Icon Glossary

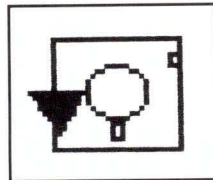
This section summarizes all of the Primary function and Subfunction icons used in Graphics Terminal Emulator. The icons are arranged in alphabetical order.

Devices



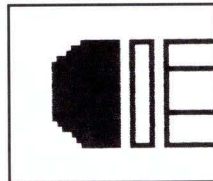
Enables you to emulate a graphics or alphanumeric terminal, to send output to an alternate output device, and to enter terminal emulation mode.

Download



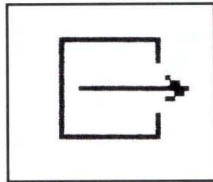
Enables you to download a file from a host computer to your computer.

Erase



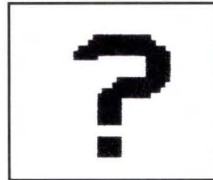
Enables you to delete a communications protocol.

Exit



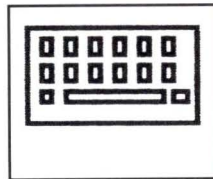
Ends the Graphics Terminal Emulator session and returns you to the operating system.

Help



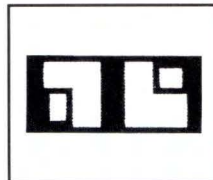
Provides help messages describing your current options in Graphics Terminal Emulator.

Local Commands



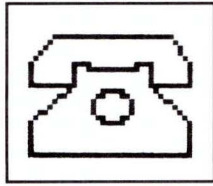
Permits access to various functions of the operating system from within Graphics Terminal Emulator.

Move Window



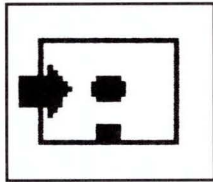
Enables you to change the size of the Help Window.

Protocol



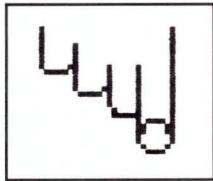
Enables you to select, define, or delete a communications protocol.

Save Environment



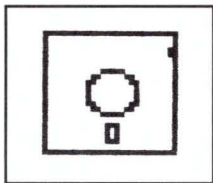
Enables you to permanently save in **terminal.env** all settings specified with the Devices, Switches, Protocol, and Storage icons.

Select



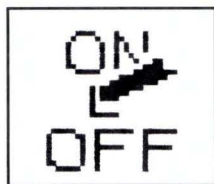
Enables you to activate a communications protocol.

Storage



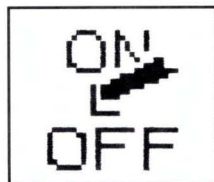
Initiates file uploading or downloading and provides access to specific local operating system functions.

Switches



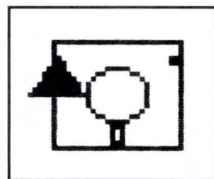
Sets the value of various switches.

Up/Down Configure



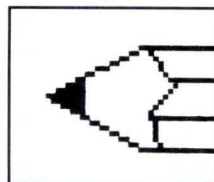
Enables you to define the type of echoing desired during uploading and downloading.

Upload



Enables you to upload a file from your computer to a host computer.

Write



Enables you to define or change the parameters of a communications protocol.

A

ADM-3A terminal 2-5, 2-14, 4-10, E-1
Alpha mode 2-14, 4-9, E-3
alpha autowrap 2-12, 4-23, D-3
alphanumeric mode 1-12
arrow bar 4-6
arrow keys 1-7, 1-9
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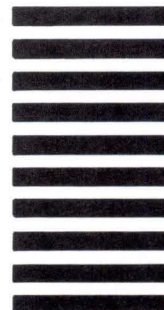
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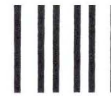
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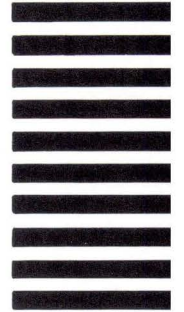
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