XEROX

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Host Interfaces

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Xerox ViewPoint

Host Interfaces Reference

Volume 9

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VP Terminal Emulation of TTY

VP Terminal Emulation of DEC VT100

VP Terminal Emulation of Tektronix 4014

VP Terminal Emulation of VT640

VP Terminal Emulation of IBM 3270

VP IBM 3270 File Transfer

The Remote Batch Service

VP Data Capture

VP Series Reference Library
Version 2.0

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Introduction

This volume is part of the *VP Series Reference Library,* which is the encyclopedia for ViewPoint software. This library provides the most complete source of information on ViewPoint and VP Series applications for your 6085 Professional Computer System or 8010 Information System.

Before you use this volume

Several separate volumes make up the *VP Series Reference Library.* Each volume provides information about a specific category of applications, such as graphics, terminal emulation, or file conversion.

Before you refer to any VP Series reference application volume, you should become familiar with the following "core" documentation:

- *ViewPoint QuickStart Training.* Provides training and exercises for basic workstation operations as well as for creating, editing, printing, mailing, and filing documents.
- *General User Reference.* Describes the basic operations common to all ViewPoint and VP Series application software.
- *Document Editor Reference* volume 3. Provides complete information on creating and editing a document.

By mastering the ViewPoint and Document Editor basics, you will soon be able to use other

VP Series applications to perform important tasks quickly and confidently.

About this volume

This volume contains the following:

- Part 1 ViewPoint Terminal Emulation
- Part 2 *VP IBM 3270 File Transfer*
- Part 3 *The Remote Batch Service*
- Part 4 *VP Data Capture*

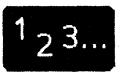
How chapters are organized

Reference material is rarely read through from cover to cover. Instead, you use it to look up specific information from time to time, much as you would use an encyclopedia.

To help you locate information, the major topics of most chapters are organized as follows:

- A key concepts section describes the principal elements of the application or feature. The key graphic illustrated at the left marks the beginning of such sections.

- A description of property sheets, option sheets, and windows provides detailed information about the properties and options related to the application.



- A procedures section provides step-by-step information on how to use the application. The 1-2-3 graphic illustrated at the left marks the beginning of such sections.

Documentation conventions

The *VP Series Reference Library* uses the following conventions:

- Square brackets. Names of commands and property and option choices that you select with the mouse appear enclosed within brackets; for example, the [Close] command.
- Angle brackets. The names of workstation keys and alternate function keys are enclosed within angle brackets; for example, the <OPEN> key and the <PROP'S> key. This convention applies to alphabetic and numeric keys. It does not apply to words used to describe keys marked with arrow symbols, such as the tab key.
- Italics. Glossary words, VP application names, volume names, and the library name appear in *italics*.
- Bold. Names of properties, options, selections in the User Profile, information you must type, notes, and warnings appear in **bold**.

As often as possible, graphic images (such as pointer arrows) are printed in the text as they appear on the screen or on the keyboard.

Hardware and software requirements

The applications described in this volume run on the 6085 Professional Computer System and the 8010 Information System.

The following 2.0 software must be installed, enabled, and running on the workstation:

- *Xerox ViewPoint*

- *VP NetCom, VP RemoteCom,* or *VP Standalone*
- *VP Document Editor*

For terminal emulation, you must also install, enable, and run at least one of the following:

- *Asynchronous Terminal Basic Software* (required for all but 3270)
- *VP Terminal Emulation of TTY*
- *VP Terminal Emulation of VT100*
- *VP Terminal Emulation of Tektronix 4014*
- *VP Terminal Emulation of VT640*
- *VP Terminal Emulation of IBM 3270*

For 3270 File Transfer, you must install, enable, and run the following applications:

- *VP IBM 3270 File Transfer*
- *VP Terminal Emulation of IBM 3270*

For Remote Batch, you must install, enable, and run the following applications:

- *Xerox ViewPoint*
- *VP File Conversion of 860 Documents*

You can send documents to the *Remote Batch Service* (RBS) from a 6085 Professional Computer System or an 8010 Information System, as well as from any device that uses the 860 format. Devices that use the 860 format include the following:

- An 820-II Personal Computer
- An 860 word processor
- A 6085 or 8010 workstation
- A Memorywriter

For Data Capture, you must install, enable, and run the following applications:

- *VP Data Capture*

Related documentation

The following training material is recommended reading. You should be familiar with the content before using any VP Series Terminal Emulation, File Transfer, Remote Batch Service, or Data Capture software.

- *Host Interfaces Training*

In addition, if you are using a VT100 terminal emulator to reach a VAX on your XNS network, you should be familiar with the following publications:

- *Xerox Network Services 4.0 for the VMS Operating System User's Guide*
- *Xerox Network Services 4.0 for the VMS Operating System Reference Manual*

Information for VP CUSP Button programmers

If you are writing a CUSP program and want the program to refer to VP terminal emulation icons, use the following as the icon types (case does not matter):

- Emulator3270
- EmulatorTTY

CUSP currently cannot manipulate the TTY-Port icon.

CUSP currently cannot manipulate the icons for *VP IBM 3270 File Transfer*.

Because the Remote Batch Service (RBS) does not have icons associated with it, CUSP cannot directly manipulate the RBS.

However, you use the RBS by storing and retrieving folders in file drawers, and folder and file drawer icons can be manipulated by CUSP. Therefore, CUSP programs can be created to automate tasks which include the use of RBS.

If you are writing a CUSP program and want the program to refer to filing icons, use the following as the icon types (case does not matter):

- Book
- Converter
- Document
- Doc860
- Folder
- FileDrawer

CUSP currently cannot manipulate a Reference icon.

You can write a CUSP program to perform Data Capture operations. For example, the program can select a document that contains a preamble, perform the [Set Preamble] menu command (without confirmation), select a source document, and perform the [Copy Text to Table] command.

The CUSP icon type for a ViewPoint document icon is Document (case does not matter).

Part 1

ViewPoint Terminal Emulation

1. Overview of ViewPoint Terminal Emulation

ViewPoint terminal emulators allow you to use your Xerox 6085 or 8010 workstation as if it were a terminal directly connected to a host. After you load, configure, and run the emulation software, you can send, receive, and manipulate data just as you would at a terminal directly connected to the host.

ViewPoint terminal emulators enable your workstation to emulate several different types of terminals. These terminals include Digital Equipment Corporation (DEC) VT100, Teletype Model 35 KSR (referred to in this volume as TTY or KSR35), Tektronix 4014, Retro-Graphics VT640, and International Business Machines (IBM) 3270-series terminals.

Chapter organization

This part of the *Host Interfaces* volume provides information on how to configure and use ViewPoint Terminal Emulation software. It assumes that you are already familiar with the operation of the terminal being emulated. If you need more information on terminal operation, refer to the documentation for the particular terminal type.

"Terminal Emulation" is divided into seven chapters and six appendices.

- This chapter provides an overview of ViewPoint Terminal Emulation and introduces its key elements.

- Chapter 2 describes TTY-port software that is used by all the TTY-based emulators. These emulators include DEC VT100, KSR35 (TTY), Tektronix 4014, and VT640. This chapter tells you how to configure the TTY-Port property sheet, how to use the port software with a terminal emulator, and how to conduct an emulation session. If you are using *VP Terminal Emulation of IBM 3270*, you do not need to read this chapter.

- Chapters 3 through 6 describe the TTY-based terminal emulators and explain how to configure the options associated with this software.

- Chapter 7 describes *VP Terminal Emulation of IBM 3270*. It explains how to configure the property and option sheets associated with this emulator and how to conduct an emulation session.

Terminal emulation capabilities

With a ViewPoint terminal emulator running on your workstation, your workstation can send data to and receive data from a host computer. In performing these functions, the workstation provides an emulation window and all the key-based operations of the terminal it is emulating. It appears to operate as a substitute terminal. However, it provides the following advantages over the terminal it emulates:

- You can use terminal emulation to capture data or text from the host and then use local resources to edit the information.

- You can move or copy portions of a local file into the emulation window, thus eliminating the need to type everything in directly at the keyboard.

- With networked terminal emulation, you can establish sessions with more than one host at a time.
- With networked terminal emulation, you can establish multiple sessions with the same host.
- While you are conducting a session with the host, you can perform other desktop functions, such as reading your mail or editing a file.

TTY and 3270 emulation

Terminal emulation is divided into two basic types: TTY emulation and 3270 emulation.

The VT100, KSR35, Tektronix 4014, and VT640 emulators are all TTY-port oriented. For these products, the terminal emulator and TTY port are represented by separate icons; you associate these icons with each other by using a simple copy or move operation. This operation is explained in the "TTY ports" chapter of this volume.

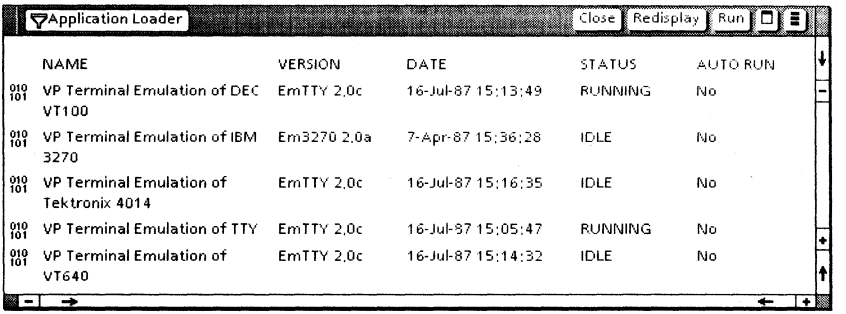
If you are using TTY-port oriented emulation, read the chapter that describes TTY ports before turning to the chapters describing the specific terminal emulations products you are using.

The IBM 3270-type terminal communicates through an IBM network to a host computer. It uses ports located on the *External Communication Service* (ECS). After reading this overview chapter, turn directly to the chapter that describes *VP Terminal Emulation of IBM 3270*.

Emulation icons

All terminal emulators are represented by terminal emulator icons, which you will use to configure the software and begin a session with the host. Before you configure emulation software, you open the Application Loader icon on your desktop and run the software for your particular terminal emulator. Figure 1-1 shows an open application loader icon with some ViewPoint terminal emulators running.

Figure 1-1 **Open application loader with emulation software**



When the Terminal Emulation software is running on your workstation, you can retrieve the icon associated with it and copy the icon to your desktop.

If your workstation is connected with the Ethernet, multiple emulation icons, representing different access paths from the network to specific host computers, can reside on the desktop. One icon, for example, might be configured to support communication with a company's own computer, while another might be configured to connect to an outside data base.

Note: If your workstation is not on a network, only one emulation session can be established at a time.

Except for copying emulation icons from the divider to your desktop, you must perform all operations on the icon once it is on your desktop.

TTY-based terminal emulation also requires you to use TTY-Port icons. These icons are described in the "TTY ports" chapter.

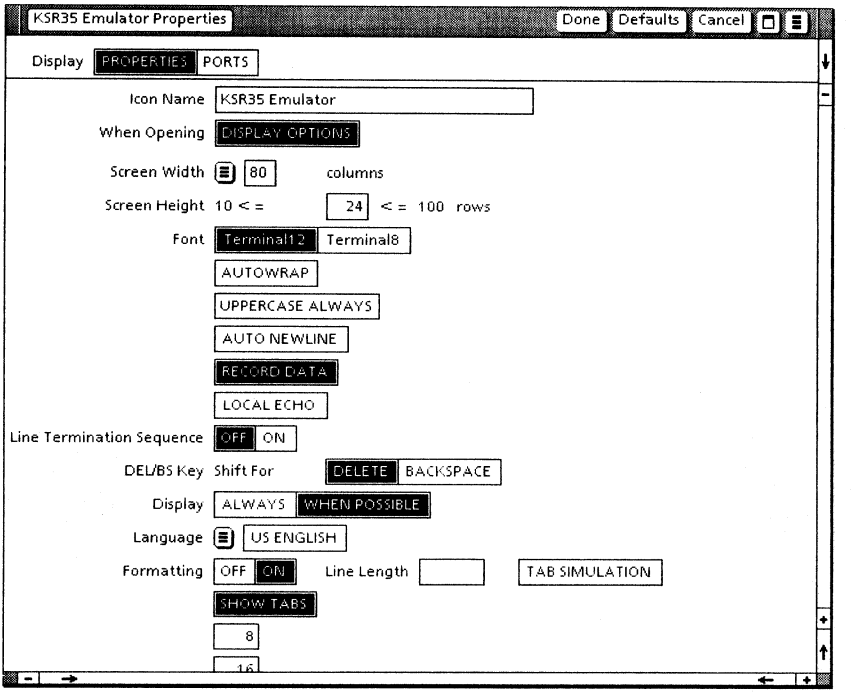
Property and option sheets

Before you use terminal emulation to connect with the host, you or your System Administrator will configure the software on property and option sheets. To configure means to assign physical and functional characteristics to the software you are about to use. For example, one such characteristic for the TTY-port software is **Enabled**, which you set to indicate whether or not the port will be used for a particular session.

You configure terminal emulation software by specifying properties and options on property and option sheets associated with the icons. Figure 1-2 shows an example of a KSR35 Emulator properties sheet.

Terminal emulator property and option sheets are almost identical. They both allow you to modify a similar set of characteristics. However, selections made on property sheets are permanent until the settings are changed, whereas selections made on option sheets are maintained only for the current session.

Figure 1-2 **KSR35 Emulator properties sheet**



Emulation window

When the session begins, the emulation icon expands into an emulation window.

The terminal emulation window displays the data that travels to and from the host computer. It is divided into two areas, a status area and a main text area.

Status area

The status area displays status indicators when the terminal being emulated provides some sort of visual feedback. Information in the status area is

displayed in a read-only format, and scrolling within this area is not possible.

For TTY-type emulation windows, the status area is at the top of the screen. This area displays LED indicators: A filled-in oval indicates that the light is on. Refer to Appendix F, "TTY status indicators," for descriptions of the LED indicators that most TTY-type terminal emulators display. LED indicators for each terminal emulator are described in the chapter about the specific emulator.

For the IBM 3270 Emulation window, the status area is at the bottom of the screen. Graphic figures and messages in this area are identical to those used in a 3278-type terminal display. These status indicators are explained in the IBM documentation for this terminal type.

Main text area

The main text area is the part of the window in which you transfer data to and from the host. Each terminal emulator has certain characteristics, such as line length, that you can configure for this area. Once a session is established, you can enter data into this area directly from the keyboard, or by copying or moving data from a desktop file.

Virtual keyboards

You use *virtual keyboards* (also called *alternate keyboards*) to type information in the emulation window. Because a terminal emulator is one kind of equipment pretending to be another, it does not have some of the hardware features that the real terminal has. Specifically, it does not have all the keys found on the terminal keyboard.

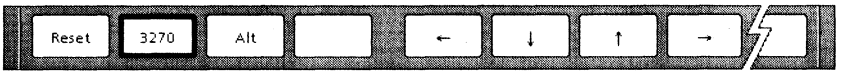
A terminal emulator provides "virtual keys" to support the functionality of the missing keys. By

using virtual keys, you can display and send all the same characters you could send from the terminal your workstation is emulating.

To use virtual keys, you first click the mouse inside the emulation window. This signals the emulator to assign new meanings to your keyboard. The keys now correspond to the keys of the main keyboard used by the terminal being emulated. You can display the new meanings by simultaneously pressing the <KEYBOARD> key and a "virtual function key" labeled <Show>.

A set of virtual function keys displays whenever you click the mouse inside the emulation window. Figure 1-3 shows an example of the virtual function key layout for 3270 emulation on a 6085 workstation.

Figure 1-3 **3270 virtual function keys**



Virtual function keys map directly to the row of keys at the top of your workstation keyboard. You can select any of these keys either with the mouse or by pressing the corresponding workstation key.

Refer to the chapter about your VP emulation product to find descriptions of the keyboards it supports.

2. TTY ports

The abbreviation *TTY* stands for teletypewriter terminal. Terminals of this type use *RS232C ports* and *asynchronous communication protocols* to send and receive data across a cable to and from a host computer. In VP terminal emulation, TTY-Port software links TTY-based terminal emulation with an RS232C physical port (or a pseudo port to a DEC VAX host computer on the network).

The TTY-based terminal emulators that use TTY ports include the KSR35 (TTY), DEC VT100, Tektronix 4014, and VT640 emulation products. For these products, you use both a TTY-Port icon and a terminal emulator icon to configure and run the software.

The TTY-Port icon represents a physical connection with certain physical properties. These properties include line speed and other measurements that define how data is transmitted from one device to another.

The host expects the connection to have a specific set of properties. Therefore, you or your System Administrator will configure the TTY-Port icon to match the host requirements.

The TTY-Port icon represents an RS232C-based port. This port can be any one of the following:

- A physical RS232C port on the External Communication Service (ECS) processor. This port is called the "ECS local port."
- A physical RS232C port on a Multi-Purpose Option (MPO) board residing on the ECS processor. This port is called an "MPO port."

- A physical RS232C port on a Communication Interface Unit (*CIU*) managed by the ECS. This port is called a "CIU port."
- A pseudo port representing access to a VAX on a Xerox Network Systems (*XNS*) network. A *pseudo port* is software pretending to be a physical port. This illusion allows the software to exchange data with a device that "expects" a physical port at the other end of a connection.
- A physical RS232C port on the workstation. This port is called the "workstation local port" and is used for workstation emulation (described below). The corresponding TTY-Port icon is labeled "Local RS232C Port."

Key concepts of workstation and networked emulation

The TTY-based terminal emulator can function as either a workstation or networked emulator. This distinction indicates whether the workstation talks to the host through an RS232C port residing on the workstation itself (the workstation local port) or whether it talks through the Ethernet.

When it performs as a workstation emulator, the workstation uses its local port and Local RS232C Communication Access software to communicate with the host.

When it performs as a networked emulator, the workstation talks through the Ethernet to the ECS. The ECS, in turn, controls communication with the host.

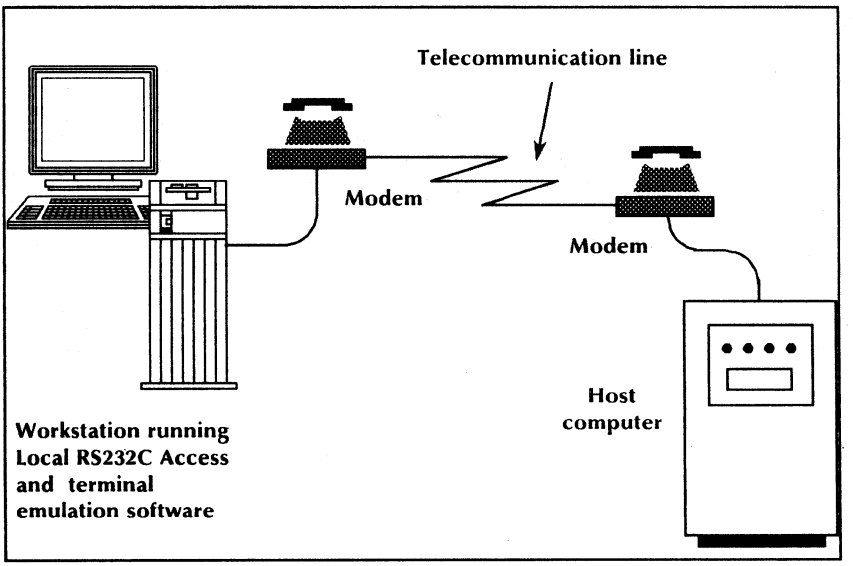
Both the Local RS232C Communication Access and the ECS provide asynchronous communication through an RS232C port.

Local RS232C Communication Access

For workstation emulation, the Local RS232C Communication Access software provides asynchronous communication through the workstation local port. This allows your workstation to control communication with the host. This method eliminates dependency on the ECS; it also allows non-networked workstations to use TTY-based emulation.

Workstation emulation uses either a direct physical connection to the host, a modem and dial-up telephone line, or a dedicated (leased) line to establish a session through the workstation local port. Figure 2-1 shows an example of workstation emulation.

Figure 2-1 **Workstation emulation**



Workstation emulation hardware/software

Workstation emulation requires the following hardware:

- RS232C port for the 8010 workstation

  Note: The RS232C port is standard equipment on the 6085 workstation; it is an optional purchase for the 8010 workstation.

- Asynchronous full-duplex modem

- RS366 port and RS366 Auto Calling Unit for the 8010 workstation to use *Xerox-approved autodialing* (using the **Phone Number** option on the option sheet). This is costly and not recommended.

In addition to the emulation and system software listed in Chapter 1, workstation emulation requires Local RS232C Communication Access.

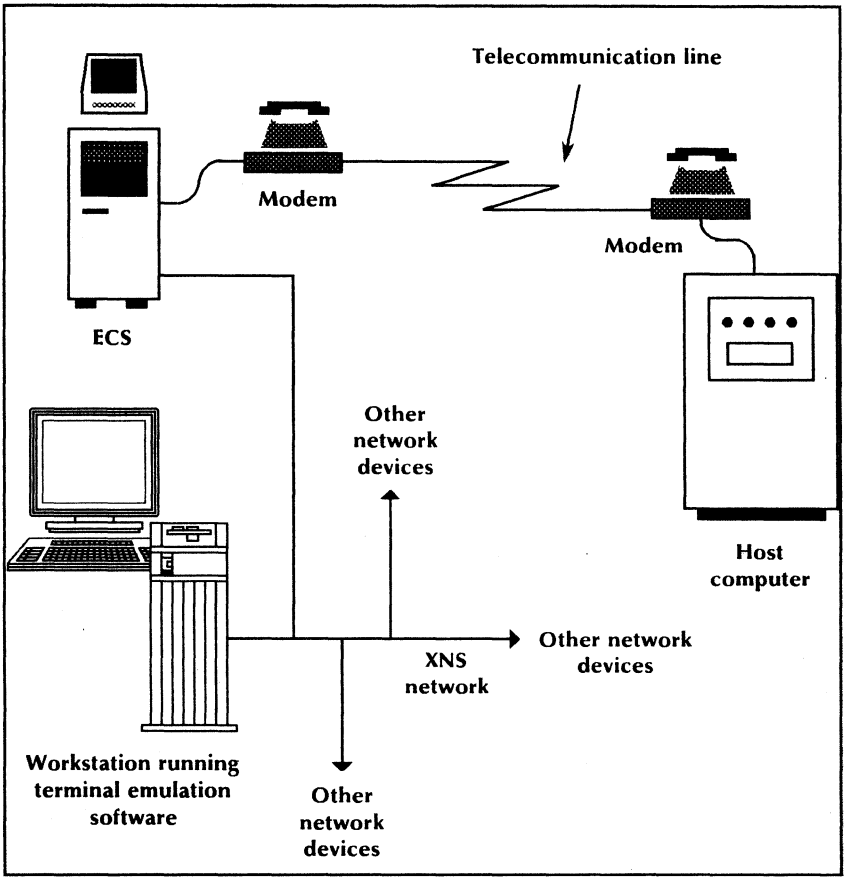
Networked emulation

Networked emulation relies on the ECS to provide asynchronous communication to and from the host.

When you use networked emulation to request a session with a remote host computer, the workstation connects over the network with the ECS. In response, the ECS initiates and maintains a session with the host computer and performs protocol conversion between the workstation and host.

Figure 2-2 shows an example of networked emulation using an ECS local port.

Figure 2-2 **Networked emulation**



Networked emulators communicate with a host through one of the following ports:

- An ECS local port
- A CIU port
- An MPO port

- A pseudo port to a VAX on the same XNS network

Note: You can use a network management port to connect to the VAX. Using the wrong port may yield unexpected results.

The CIU is a device that provides the ECS with four to eight additional RS232C ports.

This volume does not describe pseudo ports or network management ports in detail. A pseudo port appears and acts like a CIU port, and you will use it the same way. For information about network management ports, refer to the *Workstation Administration and System Resources Reference* volume in this library.

This volume also does not describe MPO ports in detail. An MPO port appears and acts like an ECS local port, and you will use it the same way.

TTY-Port properties sheet

Most TTY-port properties can be changed only for ECS local ports, which are RS232C ports on the ECS server. For other types of ports, only certain properties apply.

If the workstation uses a pseudo port to a VAX on an XNS network, changes to the property sheet are ignored.

Table 2-1 shows which properties are configurable for each port type.

Table 2-1 **Configurable TTY-Port options by port type**

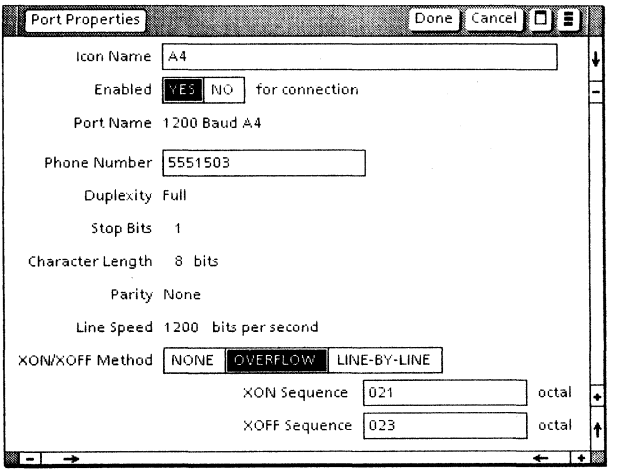
Options	ECS local port	CIU port	Work-station local port
Icon Name	•	•	•
Enabled	•	•	•
Port Name			
Phone Number	•	•	
Duplexity			
Stop Bits	•		•
Character Length	•		•
Parity	•		•
Line Speed	•		•
XON/XOFF Method	•	•	•

Note: For a workstation local port, the phone number should be left blank. For this type of

port, you can use manual dialing or autodialing (*autodialing* requires you to type modem dialing commands in the emulation window). Dialing is described in the section titled "Starting a session: workstation emulation" later in this chapter.

All properties selected on the property sheet are retained until changed or until the icon is deleted. Figures 2-3 through 2-5 illustrate the property sheets that display for the three port types: CIU ports, ECS local ports, and workstation local ports. You can refer to these figures as you read the following descriptions:

Figure 2-3 **TTY-Port properties sheet (CIU port)**



Icon Name

Used to change the name of the TTY-Port icon on the desktop. This property allows you to uniquely name each port icon. The name can be between 1 and 100 characters long. The first few characters appear on the face of the icon on the desktop.

Enabled

Determines whether or not the terminal emulator will try to connect to the host through this port. You can also change this property by using the [Enable Port] and [Disable Port] commands in the terminal floating items auxiliary menu.

Port Name

Displays, in read-only format, the name given to the port in the Clearinghouse service.

Phone Number

Specifies the full phone number to be dialed for the connection. For a workstation local port, this item should be left blank.

If no phone number is entered and the port is available, the emulator unconditionally opens the window. This is useful for the workstation local port, which uses manual dialing or autodialing (you enter modem dialing commands in the emulation window).

Duplexity

Designates whether communication can occur in both directions simultaneously ([Full]) or in one direction at a time ([Half]). This setting displays in read-only format. For a TTY-port, **Duplexity** must be set to [Full].

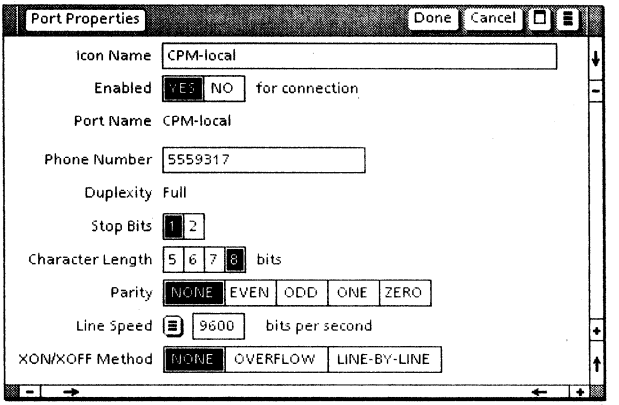
Stop Bits

Indicates the end of a character. This property cannot be changed for CIU ports. It can be set to 1 or 2 for an ECS or workstation local port. The communication hardware used in the TTY connection determines what values are legal, as well as whether or not they are electronically changeable.

Character Length

Designates the length of characters in bits. This property cannot be changed for CIU ports. This property can be set at 5, 6, 7, or 8 for the ECS or workstation local port. The communication hardware used in the TTY

Figure 2-4 **TTY-Port properties sheet (ECS local port)**



connection determines what values are legal, as well as whether or not they are electronically changeable.

Note: The workstation only supports ISO 646 7-bit ASCII character codes. This property governs the physical length of the character on the transmission line and not the size of the character set supported.

Parity

Designates the method used to check that data is not garbled in transmission. This property cannot be changed for CIU ports. It can be set to [None], [Even], [Odd], [One], or [Zero] for an ECS or workstation local port.

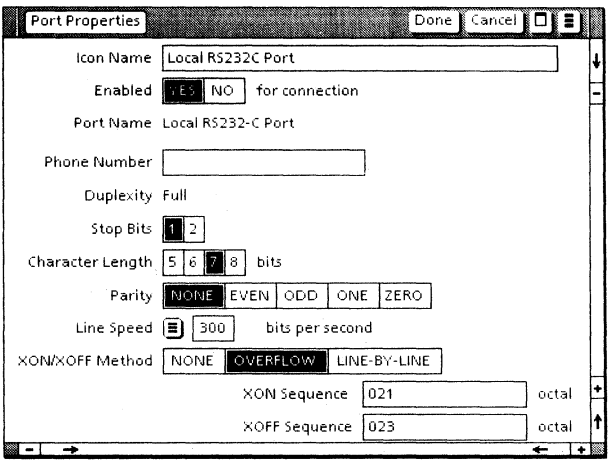
Line Speed

Specifies the rate at which data passes to and from the host computer (also known as baud rate). This property is read-only for a CIU port, and can be set to 50, 75, 110, 134.5, 150, 300, 600, 1200, 2400, 3600, 4800, 7200, 9600, and 19200 baud with a popup menu for a workstation or ECS local port. In addition to these baud rates, the ECS local

port **Line Speed** can also be set to 28800, 38400, 48000, 56000, and 57600 baud.

Although rates above 9600 baud display on this menu, they are not supported at this time. The communications hardware used in the TTY connection determines what values are legal, as well as whether or not they are electronically changeable. A rate of 1200 baud is recommended.

Figure 2-5 **TTY-Port properties sheet (workstation local port)**



XON/XOFF Method

Allows you to specify whether the port is to use flow control or not, and which method it will use. The two types of flow control are [Overflow] and [Line-by-Line].

Note: If you select a type of flow control, first ensure that the host computer accepts and uses the specified type. Otherwise, you may experience unpredictable results. For example, the system can appear to stop processing as it waits for an XON that never

comes. In this case, press <STOP> to terminate the process.

If you select [Overflow], you must specify the XON and XOFF sequences in octal numbers. The workstation issues the XOFF sequence whenever the rate of incoming data is greater than the rate at which the data can be processed (after a certain internal threshold is exceeded).

The [Line-by-Line] flow control is a half-duplex protocol. If you select [Line-by-Line], you must specify the XON sequence and XOFF sequence in octal numbers. The most common octal flow control characters are 21 (XON) and 23 (XOFF). The workstation suffixes each line sent to the host with the XOFF sequence, then waits for the host to send back the XON sequence before sending the next line.

When you select [Overflow] or [Line-by-Line], two additional lines appear, which allow you to specify the XON and XOFF sequences. Each sequence can have up to eight octal numbers in it. If the XON and XOFF sequences are to be used, these lines must not be empty or the property sheet will not close.

If you use a CIU port that has its own flow control, no workstation flow control is allowed (a message is posted). If the CIU port has flow control disabled, then the workstation may display [None] (no flow control specified), [Overflow], or [Line-by-Line]. ECS and workstation local ports always display these properties.

The CIU's flow control should be used whenever possible, because it is the system element closest to the host and therefore has the best chance of issuing XOFF before any data is lost.

Retrieving the TTY-Port icon

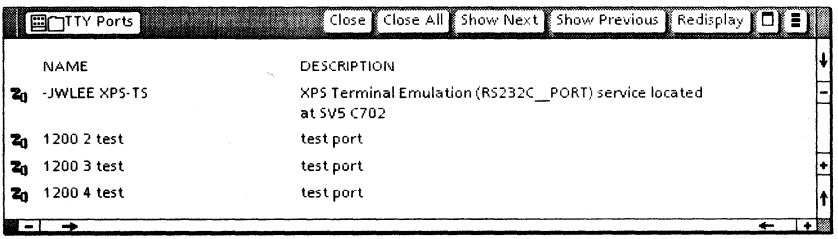
To associate one or more TTY ports with a TTY-based terminal emulator, you first find the appropriate port icon, which you then copy to your desktop. Your System Administrator can tell you which kind of port you need and has probably already configured and named the ports you will use.

Before copying a TTY-Port icon to your desktop, you must have *Asynchronous Terminal Basic Software* running in the Application Loader.

After running the prerequisite software, you can find and copy the TTY-Port icon. For an ECS local port, a CIU port, or a pseudo port to a VAX, you can find the corresponding TTY-Port icon in the TTY-Ports divider.

Figure 2-6 shows an example of a TTY-Ports divider with [Display Descriptions] selected.

Figure 2-6 **TTY-Ports divider**



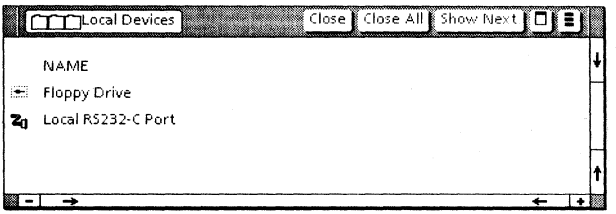
To find the TTY-Ports divider, open the Directory icon, then the Network divider. Within the Network divider, open your organization divider and then your domain divider. Next, open the TTY-Ports divider. You can select [Display Descriptions] in the floating items auxiliary menu

of the TTY-Ports divider to display information about each port.

Copy the desired port (or ports) to your desktop.

For a workstation local port, first run the *Local RS232C Communication Access* application in your loader. Then, you can find the corresponding local RS232C port icon in the Local Devices divider of the Workstation divider, which is located in the Directory. Copy the icon to your desktop. Figure 2-7 shows an example of a Local Devices divider.

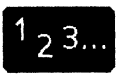
Figure 2-7 **Local Devices divider**



For networked emulation, you can associate more than one port with your terminal emulator icon. The terminal emulator can try each of a series of ports in turn until it successfully establishes a connection with the host.

You can also associate more than one port with workstation emulation, but you must dial the host manually or by using modem dialing commands for each port that the emulator tries.

Setting properties for a TTY-Port icon



To set TTY-port properties, you first select a TTY-Port icon either on your desktop or from within the TTY-based terminal emulator icon (or "terminal icon").

You must configure separate property sheets for each TTY-Port icon you will use.

On your desktop

If you have not already done so, retrieve a TTY-Port icon from the directory.

The first way to set port properties is simple and permanent: property settings remain from session to session until you change them again.

1. Select the TTY-Port icon and press <PROP'S>. The TTY-Port properties sheet displays.
2. Modify the desired properties.
3. Select [Done] in the window menu to close the property sheet and store any changes made, or select [Cancel] to close the property sheet without storing the changes.

Within a terminal icon container

TTY ports can reside inside a terminal emulator icon, which acts as a container. You can display the TTY ports that a terminal icon contains by selecting [Ports] on the terminal emulator's property or option sheet.

Two ways exist to set port properties from within a terminal icon container: one way is permanent and the other temporary (for the duration of a session).

To set port properties on a property sheet within the terminal icon, you must first copy or move the port icon into the terminal icon.

Permanent property settings

To permanently change port properties from within a terminal icon, you reach the list of ports from the terminal emulator's property sheet (not

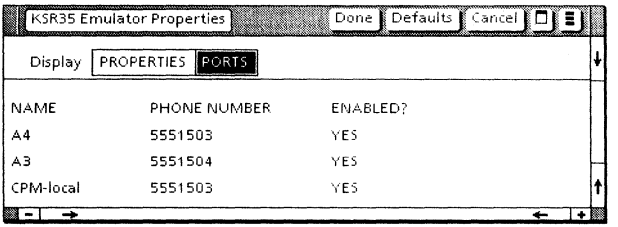
its option sheet) and then display the port property sheet.

Follow these steps:

1. Select the terminal icon and press <PROP'S>. The terminal emulator property sheet displays.

2. At the top of the terminal emulator property sheet, select [Ports]. The property sheet displays a list of the ports currently associated with this terminal icon. Figure 2-8 shows an example of TTY ports listed within a terminal icon property sheet.

Figure 2-8 **Property sheet Ports display**



3. Select the desired port; then press <PROP'S>. The TTY-Port property sheet displays.

4. Modify the desired properties.

5. Select [Done] in the window menu to close the property sheet and store changes. Select [Cancel] to close the property sheet without storing changes.

Temporary property settings

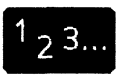
To change port properties for the duration of a single session, you reach the list of ports from the terminal emulator's option sheet (not its

property sheet) and then display the TTY-Port property sheet.

First set the **When Opening** property on the terminal emulator property sheet to [Display Options]; then follow these steps:

1. Open the terminal emulator icon. Its option sheet displays.
2. On the terminal emulator options sheet, select [Ports]. The option sheet displays a list of the ports currently associated with this icon.
3. Select the desired port; then press <PROP'S>. The TTY-Port property sheet displays.
4. Modify the desired properties.
5. Select [Done] in the window menu to close the property sheet and store changes. Select [Cancel] to close the property sheet without storing changes.

Conducting an emulation session



An emulation session begins when the workstation establishes a connection with the desired host computer. Once a session is established, the workstation becomes bound to a particular port for the duration of the session. During the session, that port is unavailable for other terminal emulators to use. When the session ends, the port becomes available again to other emulators.

Before starting a session, you must first run the TTY-based terminal emulation software in your loader, then retrieve the terminal emulator icon to your desktop. This is explained in more detail in the chapter on your terminal emulator. You

then need to associate one or more TTY ports with your terminal emulator.

Associating a port and a terminal emulator

To associate a port (or ports) with your terminal emulator:

1. Select the desired TTY-Port icon (or icons).
2. Press <COPY> or <MOVE>.
3. Select the terminal emulator icon.

You can copy or move ports to either the closed terminal emulator icon or the Ports display of the terminal emulator's property or option sheet. The Ports display is described in the chapter on your terminal emulator.

Starting a session: networked emulation

To begin a session using an ECS local port or a CIU port from a networked workstation:

1. Open the terminal emulator icon on your desktop.

   If opening the terminal icon begins the session with the host, you can skip to step 5 below.

   If opening the terminal icon displays its option sheet, this means that [Display Options] is selected on the terminal icon property sheet.

   Note: To accelerate opening the emulation window, set the desired properties on the terminal emulator property sheet, and then deselect [Display Options]. As a result, the terminal emulator option sheet will not appear each time the emulator icon opens. Change the icon label as a reminder (for example, "Fast Open").

2. Fill in the option sheet.

3. You can select [Ports] to modify properties on the TTY-Port property sheet for this session. Fill in the phone number for the host computer

4. Select [Start]. The emulation window opens.

5. When the window displays the host greeting information and a prompt, move the mouse inside the window and click the left mouse button. This activates the window to accept the data you type in.

6. Log on to the host by entering your name, password, or any other information required by the host.

To conduct a session, follow the documentation provided for the host computer environment and the applications you intend to use. Details about the emulation window, special keyboards (or "virtual keys"), cursor movements, and transferring information to and from the host are all provided in the chapter on your specific terminal emulator.

Starting a session: workstation emulation

To begin a session on a workstation using Local RS232C Communication Access and a workstation local port:

1. Open the terminal emulator icon on your desktop.

   If opening the terminal icon begins the session with the host, you can skip to step 6 below.

   If opening the terminal icon displays its option sheet, this means that [Display Options] is selected on the terminal icon property sheet.

   Note: To accelerate opening the emulation window, set the desired properties on the

terminal emulator property sheet, and then deselect [Display Options]. As a result, the terminal emulator option sheet will not appear each time the emulator icon opens. Change the icon label as a reminder (for example, "Fast Open").

2. Fill in the option sheet.

3. You can select [Ports] to modify properties on the TTY-Port property sheet for this session: Leave the **Phone Number** option blank.

4. Select [Start]. The emulation window opens.

5. You can now dial the host computer, using either autodialing or manual dialing.

   Note: Xerox-approved autodialing (using the **Phone Number** option on the option sheet) is not supported for a workstation local port on an 6085 workstation. It is supported for a workstation local port on an 8010 workstation, provided that the workstation is equipped with both an RS366 port and an RS366 Auto Calling Unit. This is costly and not recommended.

   For autodialing:

   - Wait until you see "Connection established" in the message area at the top of your screen. This means a connection is established to your modem.

   - In the emulation window, enter the modem commands required to dial your particular modem.

   For manual dialing:

   - When you see "Establishing connection" in the message area at the top of your

screen, pick up the handset attached to the modem.

- Dial the number of the host.
- When you hear the carrier tone, press the Data (or On-line) button on the modem or phone.
- Hang up the phone. In a few seconds, you should see the "Connection established" message.

6. When the window displays the host greeting information and a prompt, move the mouse inside the window and click the left mouse button. This activates the window to accept the data you type in.
7. Log on to the host by entering your name, password, or any other information required by the host.

To conduct a session, follow the documentation provided for the host computer environment and the applications you intend to use. Details about the emulation window, special keyboards (or "virtual keys"), cursor movements, and transferring information to and from the host are all provided in the chapter on your specific terminal emulator.

Ending a session

Once you have completed the tasks you need to perform on the host computer, remember to log off.

Closing the emulation window alone does not automatically log you off the host computer. A session may continue after you close the emulation window, costing you time on the host and presenting possible security problems.

To end an emulation session:

1. At the host prompt, type the log-off command your host recognizes.
2. Select [Close] at the top of the emulation window.

3. VP Terminal Emulation of TTY

The *VP Terminal Emulation of TTY* (also called the KSR35 Terminal Emulator) enables your workstation to function as a KSR35 terminal. Once your workstation establishes a connection with the host, you can use your keyboard to send commands and keystrokes to the host.

The KSR35 Terminal Emulator communicates through TTY ports. Before you use the emulator, you first configure both TTY-port and KSR35 emulator software by specifying properties on their property sheets.

To understand and use this product, first read the chapter titled "TTY ports" in this volume. It tells you how to load and configure TTY-port software and how to conduct an emulation session using TTY ports.

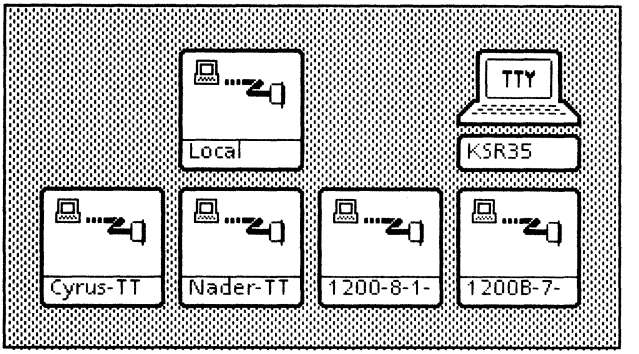
Key concepts of KSR35 terminal emulation

To use the KSR35 emulator, you retrieve and configure appropriate icons, begin a session with the host computer, and use an emulation window and virtual keyboards to communicate with the host.

Emulation icons

For KSR35 emulation, you retrieve icons for both the TTY port and the emulator. Figure 3-1 shows the KSR35 Terminal Emulator and TTY-Port icons as they might appear on your desktop.

Figure 3-1 **KSR35 emulation icons**



You can perform the following actions on your emulation icons:

- You can associate a TTY port (or ports) with the terminal emulator by copying or moving the TTY-Port icon onto the emulator icon. The emulator icon then "contains" the port. (The emulator connects to the host through the ports it contains.)
- You can define certain characteristics of the terminal emulator and the ports it contains by specifying properties and options on the terminal emulator property and option sheets.
- You can define port characteristics by specifying properties on the TTY-Port property sheet. You can display and modify this sheet either by selecting the TTY-Port icon on your desktop or from within the terminal emulator property or option sheet.

Key concepts of a session

To begin a session with the host, you open the terminal emulator icon. The session either begins automatically or the terminal emulator option sheet appears, depending on how you have

configured the **Display Options** feature on the emulator's property sheet.

If the option sheet displays, you can specify options for the session. You can also display the TTY-Port property sheet from the terminal emulator option sheet and select port properties for the session.

When you finish selecting options, select [Start]. The terminal emulator connects to the host and opens an emulation window. You use this window to exchange information with the host.

After the session begins, you can use menu commands to further control the software.

During the session, the terminal emulation software translates your keystrokes into the key codes that the KSR35 terminal would send to the host.

To end a session, you log off the host and close the emulation window.

You can find step-by-step instructions on conducting a session in the "TTY ports" chapter of this volume.

Constraints

The *VP Terminal Emulation of TTY* has the following limitations:

- Only the International Standards Organization (ISO) 646 7-bit code character set interchange is supported. (ASCII is a subset of this character set.)
- The emulator does not always display the current type-in point (such as the bottom line). You can always view the current type-in point by scrolling the window.

- Information within the emulation window cannot be directly copied or moved to another location, either within the emulation window or outside it. (You can use the [Make Screen] and [Make Document] commands, described later in this chapter, to capture information from the emulation window; then copy or move the information as you would from any ViewPoint document.)

KSR35 Terminal Emulator icon

The KSR35 Terminal Emulator icon behaves as both a functional icon and a ViewPoint container. This means, in part, that its property and option sheets provide two displays: (1) a set of properties or options that define the terminal emulator software and (2) a display of the TTY-Port icons that have been moved or copied into the terminal icon.

As a functional icon, the KSR35 Terminal Emulator icon can be used to configure and run the software associated with it. When you select [Properties] on the property sheet or [Options] on the option sheet, the properties or options you use to configure the software are displayed.

The terminal icon as a container

When you select [Ports] at the top of either the KSR35 Terminal Emulator property or option sheet, the contents of the "container" are displayed: a list of TTY ports. When you start the terminal emulation software, it interprets this list as the ports to try, in order, until it successfully reaches a host.

The terminal emulator Ports display looks and acts like an unsorted folder; however, only TTY-Port icons can be moved or copied into it. In addition, it functions somewhat differently when viewed through the option sheet rather than the

property sheet. Functional differences are explained later in this section.

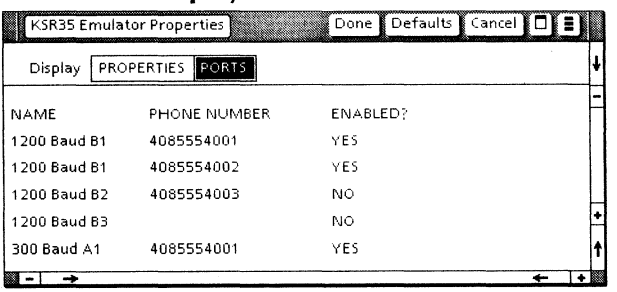
Port order

The order of ports within the terminal emulator icon is significant: It is the order in which the terminal emulator will try to use each port to make a connection. You can cause the terminal emulator to try the same port several times by having multiple copies of that port within the terminal container. The emulation software will try each enabled port, in order, either until a connection through one is successful or until all ports have been unsuccessfully tried.

You can enable and disable the port by using the [Enable Port] and [Disable Port] commands in the window's auxiliary menu or the **Enabled** property on the port's property sheet.

Figure 3-2 shows an example of a terminal emulator icon property sheet displaying the ports contained in the icon. In this example, the terminal emulator will first attempt a connection through the port called 1200 Baud B1. It will then try the same port again to a different host phone number. Then, after skipping B2 and B3, the emulator will try the slower 300 Baud A1.

Figure 3-2 **KSR35 properties sheet Ports display**



Terminal container property sheet operations

Any function that you can perform on port icons outside of the terminal property sheet Ports display you can also perform within it, such as <PROP'S>, <COPY>, and <MOVE>. All changes made to the Ports display, when shown through the terminal "container" property sheet, are remembered the next time you display the terminal property sheet or open the terminal icon to establish a session.

If you select the [Cancel] command in the property sheet window header, none of the changes you made in the container are kept. This means that a port you have moved into the container will be lost. If you use the <MOVE> key to place a port within the container and then select [Cancel], the emulation software asks you to confirm the [Cancel] operation.

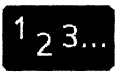
Terminal container option sheet operations

Changes you make to the contents of the terminal option sheet are in effect only for the current emulation session. For terminal options and ports to be permanent, they must be changed through the property sheet. Not all container operations can be done through the option sheet, as it is meant only to affect the current session. Table 3-1 describes the behavior of different container operations performed within the terminal icon option sheet.

Table 3-1 **Operations within the option sheet container window**

Operation	Allowed?	Behavior
Copy a port into the container	yes	Port shows up on the display, and is used when attempting connection, but does not reappear when the container is reopened.
Move a port into the container	no	—
Copy a port out of the container	yes	A copy of the port is placed where indicated outside the container.
Move a port out of the container	no	—
Delete a port from within the container	no	—
Move a port to a different position within the container	yes	Port moves within the folder, and its new position is used when attempting connection; port returns to its original position when the container is reopened.
Copy a port already in the container, placing the copy elsewhere in the container	yes	A copy of the port is placed where indicated in the container, but does not reappear when the container is reopened.
<PROP'S> on a port within the container	yes	Any changed TTY-port options will affect the current session, but will return to their previous values once the container is closed.
[Enable/Disable Port]	yes	Will change the **Enabled** option of the TTY-port as requested, but the option returns to its previous value once the container is closed.

Retrieving the KSR35 Terminal Emulator icon



To use the KSR35 terminal emulation software, you first must run *Asynchronous Terminal Basic Software* in the Application Loader. Then load and run *VP Terminal Emulation of TTY*. (See your System Administrator if you cannot run the software. It may need to be enabled.)

After running the software, retrieve a copy of the terminal icon to your desktop. To retrieve an icon:

1. Open the Workstation divider in the Directory divider.
2. Open the Terminal Emulators divider, which contains an icon for each VP terminal emulator running in your loader.
3. Copy the KSR35 Emulator icon to your desktop.

You can copy multiple icons to your desktop. You can then configure each one to represent different terminal characteristics (such as line length), a connection to a different port (or set of ports), or a connection to a different host computer. You do this by copying or moving TTY-Port icons into the terminal emulator icon.

After you configure terminal emulation properties for the terminal icon and the ports it contains, you will use the icon to start a session with the host.

KSR35 Terminal Emulator property and option sheets

KSR35 Terminal Emulator property and option sheets define the functional characteristics of your terminal emulation window.

The KSR35 Terminal Emulator option sheet is the same as the property sheet with these exceptions:

1. The **Icon Name** field displays in read-only format.
2. The **When Opening** property does not appear.
3. The [Start] command appears at the top of the option sheet window instead of the [Done] command.

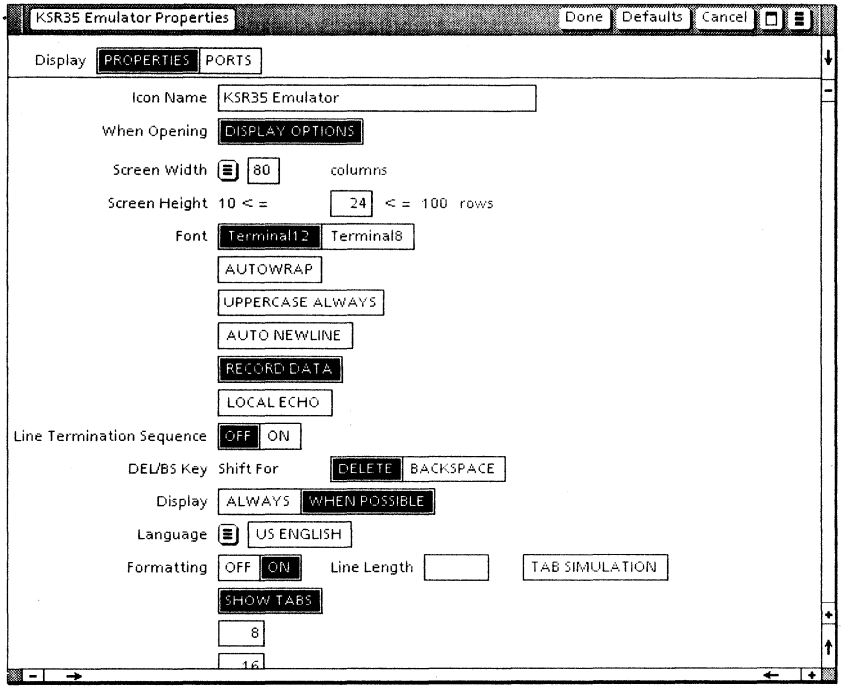
All terminal emulator properties selected on the property sheet are retained until changed or until the icon is deleted.

Figure 3-3 shows an example of a KSR35 Terminal Emulator property sheet. You can refer to it as you read the following property descriptions.

Icon Name
Allows you to uniquely name each terminal emulator icon. The name can be from 1 to 100 characters long. The first few characters will appear on the face of the icon on the desktop.

When Opening
Determines whether or not the option sheet displays when you open the terminal emulator icon. If you select [Display Options], the option sheet displays when you open the icon.

Figure 3-3 **KSR35 Emulator properties sheet**



If you do not select [Display Options], the option sheet does not display, and the settings from the property sheet apply to the session.

Screen Width

Allows you to select the number of characters (or "columns") that will fit on one line in the window. You can select [72], [80], [120], [132], or [Other]. When you select [Other], you can then enter any value from 10 through 200.

Screen Height

Allows you to select the screen height by specifying the number of lines (or "rows")

that will fit on one window. You can specify any value from 10 through 100.

Font

Allows you to select either an 8-point or a 12-point font.

Autowrap

Causes the KSR35 to automatically insert a carriage return and linefeed combination at the end of a line.

Upper Case Always

Causes all lowercase alphabetic characters (a-z) to be translated to their uppercase counterparts (A-Z) before they are sent to the host. This applies to all ViewPoint characters that have an uppercase equivalent. When no uppercase equivalent exists, the lowercase character is used. This mapping applies to characters entered into the KSR35 window from both the keyboard and from move or copy operations.

Record Data

This choice is available as an auxiliary menu command in the emulation window, as well as on the property and option sheets; so you can turn it on and off as many times as desired during a session. While this property is set, the contents of the session are saved for the [Make Document] command. While this property is not set, the contents of the screen are not saved. For details, see the section titled "[Make Document]: Transferring KSR35 information to document form" later in this chapter.

Local Echo

Specifies whether the emulator "echoes" (displays) the characters typed in or waits for the host to echo the characters. **Local Echo** [On] means that the emulator itself displays each character before sending it to the host

and does not expect the host to echo it back.

If two characters appear on the screen, it indicates that both the emulator and the host are echoing the character. In this case, local echo should be turned off at the workstation.

Line Termination Sequence

Specifies what character (or characters) replaces a carriage return (CR) just before it is sent to the host. When this property is [Off], the carriage return is sent unchanged. When this property is [On], the carriage return is replaced by the line termination sequence (LTS).

The LTS is inserted whenever a line break occurs in the KSR35 window. This happens at the following times:

- When you copy text from a document, the LTS is inserted each time the current line is full or a new paragraph character is encountered.
- When you type a carriage return at the keyboard.

You can specify from one to eight octal characters, separated by spaces or commas, for the LTS. The legal octal values range from 0 to 377. The legal characters are the digits 0 through 7, a space, and a comma.

If you enter an illegal value or character, you will not be able to close the property sheet until you correct the error.

These octal numbers represent any byte from the standard ISO 646 7-bit character set. Valid separator characters are spaces (" ") or commas (",") in any combination. A comma is legal after a number or space.

The following are valid sequences:

- 15,012,23 (=carriage return-linefeed-DC3)
- 015, 12 (=carriage return-linefeed)
- 23, 015,12 (=DC3-carriage return-linefeed, with any number of spaces)
- 23 (=DC3)
- 0 00 1 2 377 10 023 (=0,0,0,1,2,377,10,23)
- 015, 12, 23, 15 0 23 (combinations of blanks and commas = 15,12,23,15,0,23)

The LTS is defined by the host computer to which the emulator connects. Therefore, you must enter an LTS that is legal for the host computer.

DEL/BS Key

Determines how the backspace key and the shift-backspace key will be represented. If you select [Delete], then <Shift> <Backspace> becomes the equivalent of the delete key, and <Backspace> becomes the equivalent of the backspace key. If you select [Backspace], this is reversed.

Display

Allows you to specify whether text is displayed immediately when it is sent to the display ([Always]), or whether text is accumulated and displayed as part of a background process ([When Possible]). This choice is available as an auxiliary menu command in the emulation window, as well as on the property and option sheets.

Language

Determines which character translations will be used.

Formatting

Allows you to specify that the terminal

emulator will perform formatting operations to simulate much of the ViewPoint document format of the source text. It performs this formatting during move or copy operations into the terminal emulation window. It will also automatically insert an LTS at the end of each transmitted line.

Note: For **Formatting** to work correctly, the LTS must be set to [15,12].

Line Length

If you select **Formatting** [On], the **Line Length** property displays. This property allows you to specify the maximum number of characters per line, not including the LTS, for text copied or moved into the emulation window.

The total line length is equal to the **Line Length** value plus the LTS. **Line Length** is independent of the **Screen Width** property.

When this property is set and you copy or move text from a ViewPoint document, the emulator determines where a line break should occur. It keeps the line at or below the specified line limit and inserts an LTS at that point.

It is recommended that you prepare the source document in a fixed pitch font (for example, Terminal 12). If you do this with margins and text equal to the **Line Length**, these line breaks should occur at approximately the same point in the destination text as in the source document.

This property will not affect the processing of text input from the keyboard.

The emulator does the following relative to various ViewPoint document conditions:

- If possible, lines are broken on a space, paragraph tab, normal tab, hyphen, or discretionary hyphen character. These are referred to as *line-break characters*. If the line has no line-break characters, it is broken at the line limit.

- When the break would occur immediately after the line limit, the line will be broken at the line limit. If the break occurred as a result of a space or tab, that character is discarded and the following character is placed in the first column of the next line.

- Paragraphs keyed without explicit new line characters are broken at the line-break character that appears closest to the line limit.

- If the source document has lines that are longer than the line limit setting, they are also broken at the line-break character that appears on or before the line limit. This will not be the same line breaking point seen in the open document.

Tab Simulation

If you select **Formatting** [On], the **Tab Simulation** property displays. This property determines whether or not the terminal emulator automatically converts tab characters to spaces for transmission to the host. When this property is set and you copy or move text into the emulation window, the emulator determines how many spaces to insert on the line so the next character properly aligns on the next tab stop, as determined by the source selection. If you have prepared the document in fixed pitch font, as recommended, the information formatted

with tabs should appear much as it does in the displayed document.

When **Tab Simulation** is not selected and text is moved or copied from a ViewPoint document, both normal and paragraph tabs are converted to the ISO 646 horizontal tab (HT) character.

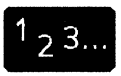
This property does not affect the processing of text input from the keyboard.

Show Tabs

When you select the **Show Tabs** property, the emulator displays the current tab settings and allows you to change them. You can change these tabs individually or clear them by setting them to zero. When the **Show Tabs** property is not selected, the tab settings do not display, but their settings are still applied.

These tab settings should not be confused with the tab settings obtained during a move or copy operation, in which tab stops are interpreted from the source selection.

Using the KSR35 Terminal Emulator property and option sheets



You can use the KSR35 Terminal Emulator property and option sheets to set properties and options both for the terminal emulator and for any TTY ports it contains. Settings on the property sheet are permanent: They remain from session to session. Settings on the option sheet are temporary: They remain for the duration of a session.

Setting TTY-port properties through the terminal emulator property and option sheets is described in the chapter titled "TTY ports."

This section describes setting terminal emulator properties and options.

Setting KSR35 properties on the property sheet

To set properties on the KSR35 Terminal Emulator property sheet:

1. Select the KSR35 Terminal Emulator icon and press <PROP'S>.
2. Select the desired properties.
3. Select [Done] in the window menu to close the property sheet and store any changes made. Select [Cancel] to close the property sheet without storing changes.

Setting KSR35 options on the option sheet

To set options on the KSR35 Terminal Emulator option sheet, first check the property sheet to assure that the **When Opening** option is set to [Display Options].

1. Select the KSR35 Terminal Emulator icon and press <OPEN>.
2. Select the desired options.
3. Select [Start] in the window menu to begin a session using the options you have selected. Select [Cancel] to close the emulator icon without starting a session.

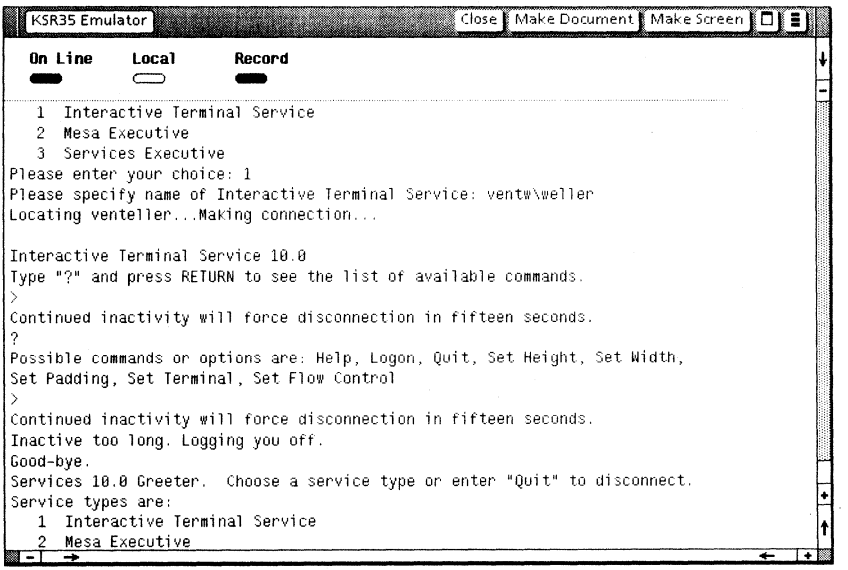
The options you select will only affect the current session. The next time you display the option sheet, it will show the same settings as the property sheet.

KSR35 window

When an emulation session begins, the KSR35 Terminal Emulator icon expands into a KSR35 window (or "emulation window").

The KSR35 window displays the data that travels to and from the host computer. It is divided into two areas: a status area and a main text area. Figure 3-4 shows a KSR35 window with a session in progress.

Figure 3-4 **KSR35 emulation window**



Window commands

In the gray bar at the top of the window are commands you can use to regulate the emulation session. Commands unique to KSR35 emulation are described below:

[Make Document]
Creates a document containing all information appearing in the current screen plus all the information that has been scrolled off the screen since the last time [Make Document] was selected, provided that the [Record Data] command is also selected. The [Make Document] command is described in more detail in the "Transferring information" section later in this chapter.

[Make Screen]
Captures the information currently displayed on the screen and copies it into a document. The [Make Screen] command is described in more detail in the "Transferring information" section later in this chapter.

The following commands are found in the floating items auxiliary menu:

[Show Port Properties]
Displays, in read-only format, the property sheet for the TTY port through which the connection was made.

[Enable/Disable Online]
Controls whether or not the information you type in the emulation window is conveyed to the host.

This command does not affect your connection to the host. Your workstation remains connected and continues to receive and process data from the host whether or not this command is enabled.

The Online light indicator in the status area indicates if this command is enabled. If the

light is lit, the information you type in the emulation window is sent to the host; if the light is not lit, the information you type in the emulation window is not sent to the host.

[Enable/Disable Local Echo]
Controls whether the emulator "echoes" (displays) the characters you type or waits for the host to echo the characters. If the Local Echo light indicator in the status area is lit, local echo is enabled, and the emulator echoes the characters you type. If the host echoes characters, this command should be disabled.

[Record/Don't Record Data]
Determines whether data is recorded to a *backing document* for use by the [Make Document] command. Data is recorded as it is scrolled off the display. This command can be turned on and off at any time, and lets you stop recording data that does not need to be saved. Performance increases slightly when [Don't Record Data] is selected, because data is not being copied to the backing document. When [Record Data] is selected, data is placed in the backing document as it is scrolled out of the KSR35 window.

Note: To improve performance, select [Don't Record Data] in the KSR35 window auxiliary menu if [Make Document] will not be selected in the current session.

[Use/Don't Use Auto-Newline]
Causes a carriage return received from the host computer to be followed immediately by a linefeed, thereby advancing the caret to the first column of the next line. If [Don't Use Auto-Newline] is selected, a carriage return received from the host computer will not be followed by a linefeed, and the caret will move to the first column of the current line.

[Enable/Disable LTS]
Allows you, during a session, to enable or disable the sending of the Line Termination Sequence (LTS). When the LTS is enabled, pressing the <Return> key sends the sequence of octal codes specified by the **Line Termination Sequence** property or option on the KSR35 Terminal Emulator property or option sheet. When the LTS is disabled, only a carriage return is sent.

[Enable/Disable Autowrap]
Controls whether the KSR35 automatically places a carriage return-linefeed combination at the end of a line. If autowrap is disabled and the last character position is reached on a line, the next character you type is displayed on top of the previous character.

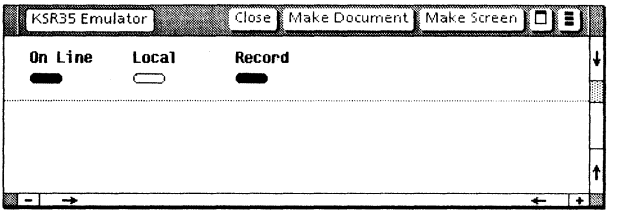
[Display Always/Display When Possible]
Controls whether text displays immediately when sent to the emulation window, or whether it accumulates as part of a background process and is displayed when possible. If data from the host does not appear on your screen, select [Display Always].

Status area

Status area symbols provide visual feedback from the host. Information in the status area is displayed in a read-only format. During emulation, "light" indicators appear in the KSR35 status area. A filled-in oval indicates that the light is on. Figure 3-5 shows the KSR35 window status area.

Appendix F, titled "TTY status indicators," describes the status indicators that appear for most TTY-type emulators.

Figure 3-5 **KSR35 window status area**



Main text area

All your interaction with the host is conducted inside the main text area. This area can contain up to 100 lines, as specified for the **Screen Height** property or option on the KSR35 Terminal Emulator property or option sheet. Each line can contain up to the number of characters (or "columns") set by the **Screen Width** property. You enter text to this area directly from your keyboard or by copying or moving it from a document.

The terminal emulator places incoming characters in the rightmost character position in the bottom line of text. When the screen is full, the emulator scrolls up the contents of the window one line at a time when you press the carriage return or when it receives more data from the host.

Not all 100 lines may be visible if the window is smaller than its standard size. The emulator does not always keep the bottom line visible. Thus, if you are typing at the bottom of the text area, you may not see the line you are currently typing (or the host's response). However, you can always display it by using the window scroll bars or by adjusting the size of the window.

KSR35 virtual keys

When you click the left mouse button within the emulation window, the emulation window becomes *active*. The emulator software displays a set of virtual function keys at the bottom of your screen. These keys include <Break> and <Escape>. The emulator also remaps the workstation's keyboard to represent the keys and functions normally found at a KSR35 terminal.

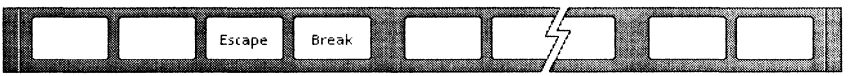
Besides the virtual function keys that are displayed automatically, you can display the keyboard's new meanings on the screen in a virtual keyboard window. This gives you full access to all ASCII control codes.

The KSR35 emulation keyboard emulates the main TTY alphanumeric keyboard used by all asynchronous type terminals.

KSR35 virtual function keys

The set of virtual function keys that first displays is shown in Figure 3-6 and explained below.

Figure 3-6 **KSR35 virtual function keys (6085 workstation)**



Note: Key labels and positioning are different for the 6085 and 8010 workstations.

The KSR35 virtual function keys include:

<Escape>
Equivalent to the actual KSR35 <ESCAPE> key.

<Break>
Equivalent to the actual KSR35 <BREAK> key.

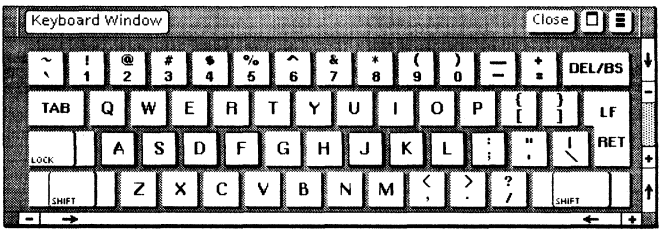
KSR35 Main keyboard

When the emulation window is active, you can display the KSR35 Main keyboard by simultaneously pressing the <KEYBOARD> key and the function key corresponding to <Show>.

To use the KSR35 Main keyboard, press the real key corresponding to the position of the desired key in the virtual keyboard display.

Figure 3-7 illustrates the KSR35 Main keyboard for the 6085 workstation.

Figure 3-7 **KSR35 Main keyboard (6085 workstation)**



Note: For the 8010 workstation, the <Para-tab> key is equivalent to <Ctrl>. For the 6085 workstation, <KEYBOARD> (not shown) is equivalent to <Ctrl>.

Select anywhere outside the emulation window to return the keyboard to its original meanings.

Note: While the emulation window is active, you can change the meaning of the keyboard to an inappropriate setting by pressing <KEYBOARD> and selecting a different setting. For example, you can select the ViewPoint Office keyboard setting while the emulation window is

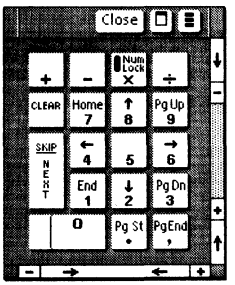
active. However, when you type inside the window, characters without equivalents in the KSR35 character set appear as question marks.

Ten-Key Pad

On the 6085 workstation, when you display the KSR35 Main keyboard, the Ten-Key Pad window displays beside it. On the 8010 workstation, when you display the KSR35 Main keyboard, two key pad windows display beside it: the regular 8010 key pad and the Ten-Key Pad.

Figure 3-8 illustrates the KSR35 Ten-Key Pad window.

Figure 3-8 **KSR35 Ten-Key Pad**



To display the Ten-Key Pad window:

1. Select inside the emulation window.
2. Hold down the <KEYBOARD> key.
3. Press the function key corresponding to <Show>.
4. Release both keys.

A visual representation of the Ten-Key Pad appears next to the KSR35 Main keyboard.

On a 6085 workstation, either you can use the physical key pad on the keyboard or you can

select within the Ten-Key Pad window with the mouse to enter characters shown in the Ten-Key Pad window.

On an 8010 workstation, select within the Ten-Key Pad window with the mouse.

Control of the cursor

The KSR35 emulator cursor, an underscore, appears in the emulation window at all times.

The cursor marks the position where the next input character is inserted. Its location is set by the host computer.

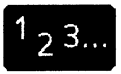
You can enter information at the cursor location only when the KSR35 window is active. "Active," in this sense, means that the current type-in point is inside the emulation window: The characters you type appear in the window.

To make the window active, move the mouse inside it and click the left mouse button.

When the emulation window is not active, the host computer can still send data to display in the emulation window. When the host computer sends data to the workstation, it sets the emulator cursor independently of the workstation's current type-in point. Thus, you can continue to work in another window despite activity within the emulation window. However, for you to enter characters in the window, you must reactivate the window by clicking the left mouse button inside it.

When the window is active, the cursor is black. When the window is not active, the cursor is gray.

Transferring information



During a session, you transfer information to and from the host. You can also use workstation KSR35 emulation to transfer information to and from another workstation.

This section describes copying and moving text from your desktop to the emulation window, as well as exchanging data with another workstation. It then describes the [Make Document] and [Make Screen] commands that you use to capture information from the host.

Copying and moving text to the host

The emulator allows you to transfer text from desktop documents to a host computer:

1. Select the desired text that is to be transferred.
2. Press <COPY> or <MOVE>, as appropriate.
3. Select the destination inside the KSR35 window. The cursor marks the location at which the next character will be inserted.

When you move or copy information into a KSR35 window, the following changes take place:

- Character properties are ignored.
- Characters or symbols without emulation equivalents appear as question marks.
- New line and new paragraph characters are converted to standard carriage returns.
- Text copied or moved into an emulation window always appears at the end of existing text.

- Information in the emulation window cannot be selected, copied, or moved to another location.

The amount of text that can be copied or moved into a window varies between host systems.

CAUTION: If the host computer does not support flow control (or if the host supports it, but it is not properly selected on the TTY-Port property sheet), a copy or move operation may result in data lost at the host. A move operation also deletes the source text at the workstation: Thus data can be permanently lost.

When **Formatting** is selected on the property or option sheet, lines in the document are broken at space, paragraph, paragraph tab, normal tab, hyphen, or discretionary hyphen characters if at all possible. These are referred to as line break characters. Line break conditions are described under **Line Length** in the section of this chapter called "KSR35 Terminal Emulator property and option sheets."

Terminal-to-terminal communication using workstation KSR35 emulation

When you use workstation KSR35 emulation (with *Local RS232C Communication Access*), you can exchange data with another user at a TTY-type terminal or terminal emulator. In this type of a session, neither end acts as the host: The terminal users at each end can send data to be displayed in the other user's emulation window.

To receive incoming calls from another terminal:

1. You and the sender first must agree on parameter settings for the workstation local port, such as **Line Speed** and **Character Length**.

2. Copy a workstation local port with the agreed upon settings onto the KSR35 Emulator icon.

3. Open the KSR35 Emulator icon.

4. The sender dials the number of the phone that is connected via modem to your workstation, thus connecting to your emulator.

5. Switch the modem to Data. The information from the sender is transferred into the emulation window. You can then use [Make Document] or [Make Screen] to place the information in a document.

You can also connect two neighboring workstations by attaching a null modem cable to their RS232C ports.

Make Document: Transferring KSR35 information to document form

When you select [Make Document], information from the emulation window is transferred into a document. All information appearing on the current screen, plus all the information that has been scrolled off the screen since [Make Document] was last selected, is transferred.

Thus, if you use [Make Document], then scroll to another screenful of information, and repeat [Make Document], you will obtain two copies of the first screen: one at the end of the first document and another at the beginning of the second document. In the first document, the current screen is the last information captured; in the second document, the screen has become part of the information scrolled off the screen since [Make Document] was last invoked.

To use [Make Document], you must have the *VP Document Editor* running in your loader.

[Record Data] must be selected in the floating items auxiliary menu before [Make Document] can be selected. Any information scrolled off the screen before [Record Data] is selected is lost. Thus, you can use [Record Data] to limit the

amount of data captured, turning it on before and off after the specific lines you want recorded.

To transfer information from an emulation window, select [Make Document] in the window header. The transferred information appears as an icon with a name and a time stamp. For example:

1200B-VAX of 4-MAR-88 11:46:52PST

The length of the icon name determines whether or not the time stamp will show. If the emulator name contains over 50 characters, the emulator icon name is truncated in the name of the resulting document. In that case, the document icon name contains the first 50 characters, an ellipsis (. . .), and a time stamp:

<name> . . . <time stamp>

Note: Pressing <STOP> interrupts the [Make Document] process; however, any information being transferred to the document may be lost or incomplete.

Make Screen: Transferring a KSR35 screen to document form

When you select [Make Screen], a single screen of information is transferred from the emulation window into a document.

To use [Make Screen], you must have the *VP Document Editor* running in your loader.

To transfer information from an emulation window, perform the operations necessary to display the desired information on the screen, and then select [Make Screen] in the window header. This information appears as a document icon with the KSR35 icon's name and a time stamp. The rules for the formation of the document icon name are the same as for the [Make Document] icon described above.

Pressing <STOP> interrupts the [Make Screen] process; however, any information being transferred may be lost or incomplete.

Using captured information

Once you capture information using [Make Document] and [Make Screen], you can manipulate the resulting document as you would any other document. This includes printing, filing, formatting, editing, and mailing.

You can use *VP Data Capture* to run such information through a program that formats it as a table. This feature allows you to transfer data easily into record files or bar charts. *VP Data Capture* is described in a separate part of this volume.

4. VP Terminal Emulation of DEC VT100

The *VP Terminal Emulation of DEC VT100* enables your workstation to function as a VT100 terminal. Once your workstation establishes a connection with the host, you can use your keyboard to send commands and keystrokes to the host.

The VT100 emulator communicates through TTY ports. Before you use the emulator, you first configure both TTY-port and VT100 emulator software by specifying properties on their property sheets.

To understand and use this product, first read the chapter titled "TTY ports" in this volume. It tells you how to load and configure TTY-port software and how to conduct an emulation session using TTY ports.

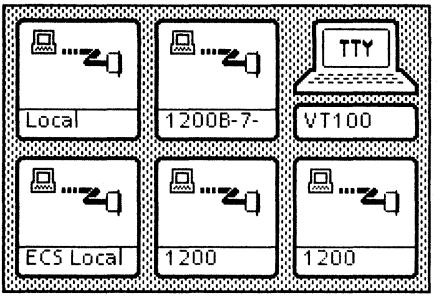
Key concepts of VT100 terminal emulation

To use the VT100 emulator, you retrieve and configure appropriate icons, begin a session with the host computer, and use an emulation window and virtual keyboards to communicate with the host.

Emulation icons

For VT100 emulation, you retrieve icons for both the TTY port and the emulator. Figure 4-1 shows the VT100 Terminal Emulator and TTY-Port icons as they might appear on your desktop.

Figure 4-1 **VT100 emulation icons**



You can perform the following actions on your emulation icons:

- You can associate a TTY port (or ports) with the terminal emulator by copying or moving the TTY-Port icon onto the emulator icon. The emulator icon then "contains" the port. (The emulator connects to the host through the ports it contains.)
- You can define certain characteristics of the terminal emulator and the ports it contains by specifying properties and options on the terminal emulator property and option sheets.
- You can define port characteristics by specifying properties on the TTY-Port property sheet. You can display and modify this sheet either by selecting the TTY-Port icon on your desktop or from within the terminal emulator property or option sheet.

Key concepts of a session

To begin a session with the host, you open the terminal emulator icon. The session either begins automatically or the terminal emulator option sheet appears, depending on whether or not you have selected [Display Options] on the emulator's property sheet.

If the option sheet displays, you can specify options for the session. You can also display the TTY-Port property sheet from the terminal emulator option sheet and select port properties for the session.

When you finish selecting options, select [Start]. The terminal emulator connects to the host and opens an emulation window. You use this window to exchange information with the host.

After the session begins, you can use menu commands to further control the software.

During the session, the terminal emulation software translates your keystrokes into the key codes that the VT100 terminal would send to the host.

The VT100 terminal emulator provides the Personal Computing Resource (PCR) feature, which allows the workstation to send escape sequences not found on VT100 terminals. This feature also lets the emulator exchange data with a VT100-compatible PC.

To end a session, you log off the host and close the emulation window.

You can find step-by-step instructions on conducting a session in the "TTY ports" chapter of this guide.

Constraints

The *VP Terminal Emulation of DEC VT100* has the following limitations:

- Only the International Standards Organization (ISO) 646 7-bit code character set interchange is supported. (ASCII is a subset of this character set.)
- The emulator does not always display the current type-in point (such as the bottom

line). You can always view the current type-in point by scrolling the window.

- Information within the emulation window cannot be directly copied or moved to another location, either within the emulation window or outside it. (You can use the [Make Screen] and [Make Document commands, described later in this chapter, to capture information from the emulation window; then copy or move the captured information as you would from any ViewPoint document.)

VT100 Terminal Emulator icon

The VT100 Terminal Emulator icon behaves as both a functional icon and a ViewPoint container. This means, in part, that its property and option sheets provide two displays: (1) a set of properties or options that define the terminal emulator software and (2) a display of the TTY-Port icons that have been moved or copied into the terminal icon.

As a functional icon, the VT100 Terminal Emulator icon can be used to configure and run the software associated with it. When you select [Properties] on the property sheet or [Options] on the option sheet, the properties or options you use to configure the software are displayed.

The terminal icon as a container

When you select [Ports] at the top of either the VT100 Terminal Emulator property or option sheet, the contents of the "container" are displayed: a list of TTY ports. When you start the terminal emulation software, it interprets this list as the ports to try, in order, until it successfully reaches a host.

The terminal emulator Ports display looks and acts like an unsorted folder; however, only TTY-Port icons can be moved or copied into it. In addition, it functions somewhat differently when viewed through the option sheet rather than the property sheet. Functional differences are explained later in this section.

Port order

The order of ports within the terminal emulator icon is significant: It is the order in which the terminal emulator will try to use each port to make a connection. You can cause the terminal emulator to try the same port several times by having multiple copies of that port within the terminal container. The emulation software will try each enabled port, in order, either until a connection through one is successful or until all ports have been unsuccessfully tried.

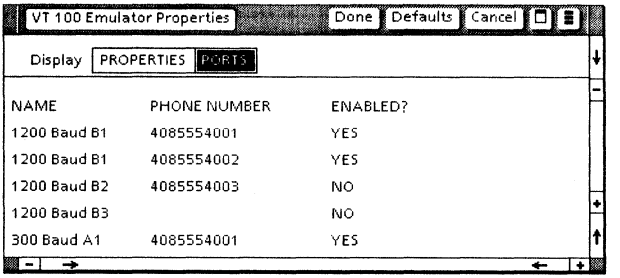
You can enable and disable the port by using the [Enable Port] and [Disable Port] commands in the window's auxiliary menu or the **Enabled** property on the port's property sheet.

Figure 4-2 shows an example of a terminal emulator icon property sheet displaying the ports contained in the icon. In this example, the terminal emulator will first attempt a connection through the port called 1200 Baud B1. It will then try the same port again to a different host phone number. Then, after skipping B2 and B3, the emulator will try the slower 300 Baud A1.

Terminal container property sheet operations

Any function that you can perform on port icons outside of the terminal property sheet Ports display you can also perform within it, such as <PROP'S>, <COPY>, and <MOVE>. All changes made to the Ports display, when shown through the terminal "container" property sheet, are remembered the next time you display the

Figure 4-2 **VT100 properties sheet Ports display**



terminal property sheet or open the terminal icon to establish a session.

If you select the [Cancel] command in the property sheet window header, none of the changes you made in the container are kept. This means that a port you have moved into the container will be lost. If you use the <MOVE> key to place a port within the container and then select [Cancel], the emulation software asks you to confirm the [Cancel] operation.

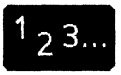
Terminal container option sheet operations

Changes you make to the contents of the terminal option sheet are in effect only for the current emulation session. For terminal properties and ports to be permanent, they must be changed through the property sheet. Not all container operations can be done through the option sheet, as it is meant only to affect the current session. Table 4-1 describes the behavior of different container operations performed within the terminal icon option sheet.

Table 4-1 **Operations within the option sheet container window**

Operation	Allowed?	Behavior
Copy a port into the container	yes	Port shows up on the display, and is used when attempting connection, but does not reappear when the container is reopened.
Move a port into the container	no	—
Copy a port out of the container	yes	A copy of the port is placed where indicated outside the container.
Move a port out of the container	no	—
Delete a port from within the container	no	—
Move a port to a different position within the container	yes	Port moves within the folder, and its new position is used when attempting connection; port returns to its original position when the container is reopened.
Copy a port already in the container, placing the copy elsewhere in the container	yes	A copy of the port is placed where indicated in the container, but does not reappear when the container is reopened.
<PROP'S> on a port within the container	yes	Any changed TTY-port options will affect the current session, but will return to their previous values once the container is closed.
[Enable/Disable Port]	yes	Will change the **Enabled** option of the TTY-port as requested, but the option returns to its previous value once the container is closed.

Retrieving the VT100 Terminal Emulator icon



To use the VT100 terminal emulation software, you first must run *Asynchronous Terminal Basic Software* in the Application Loader. Then load and run *VP Terminal Emulation of DEC VT100.* (See your System Administrator if you cannot run the software. It may need to be enabled.)

After running the software, retrieve a copy of the terminal icon to your desktop. To retrieve an icon:

1. Open the Workstation divider in the Directory divider.
2. Open the Terminal Emulators divider, which contains an icon for each VP terminal emulator running in your loader.
3. Copy the VT100 Emulator icon to your desktop.

You can copy multiple icons to your desktop. You can then configure each one to represent different terminal characteristics (such as line length), a connection to a different port (or set of ports), or a connection to a different host computer. You do this by copying or moving TTY-Port icons into the terminal emulator icon.

After you configure terminal emulation properties for the terminal icon and the ports it contains, you will use the icon to start a session with the host.

VT100 Terminal Emulator property and option sheets

VT100 Terminal Emulator property and option sheets define the functional characteristics of your terminal emulation window.

The VT100 Terminal Emulator option sheet is the same as the property sheet with these exceptions:

1. The **Icon Name** field displays in read-only format.
2. The **When Opening** property does not appear.
3. The [Start] command appears at the top of the option sheet window instead of the [Done] command.

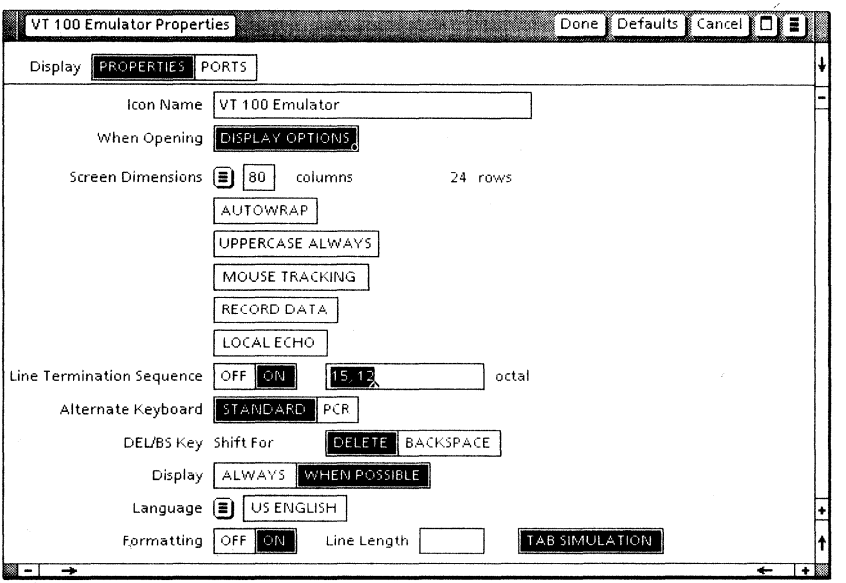
All terminal emulator properties selected on the property sheet are retained until changed or until the icon is deleted.

Figure 4-3 shows an example of a VT100 Terminal Emulator property sheet. You can refer to it as you read the following property descriptions.

Icon Name
Allows you to uniquely name each terminal emulator icon. The name can be from 1 to 100 characters long. The first few characters will appear on the face of the icon on the desktop.

When Opening
Determines whether or not the option sheet displays when you open the terminal emulator icon. If you select [Display Options], the option sheet displays when you open the icon.

Figure 4-3 **VT100 Emulator properties sheet**



If you do not select [Display Options], the option sheet does not display, and the settings from the property sheet apply to the session.

Screen Dimensions

Allows you to select the screen width and to display the number of screen rows in read-only format. The screen width is the number of characters (or "columns") that will fit on one line in the window. You can specify either [80] or [132]. The number of screen rows is set at 24.

Autowrap

Causes the VT100 to automatically insert a carriage return and linefeed combination at the end of a line.

Upper Case Always

Causes all lowercase alphabetic characters

(a-z) to be translated to their uppercase counterparts (A-Z) before they are sent to the host. This applies to all ViewPoint characters that have an uppercase equivalent. When no uppercase equivalent exists, the lowercase character is used. This mapping applies to characters entered into the VT100 window from both the keyboard and from move or copy operations.

Mouse Tracking

Enables you to use the mouse to select anywhere in the emulation window and have the proper cursor positioning escape sequences sent to the host. These sequences instruct the host to position the cursor at the current mouse position. You can select mouse tracking using an auxiliary menu command in the emulation window, as well as on the property and option sheets.

Record Data

This choice is available as an auxiliary menu command in the emulation window, as well as on the property and option sheets; so you can turn it on and off as many times as desired during a session. While this property is set, the contents of the session are saved for the [Make Document] command. While this property is not set, the contents of the session are not saved. For details, see the section titled "[Make Document]: Transferring VT100 information to document form" later in this chapter.

Local Echo

Specifies whether the emulator echoes (displays) the characters typed in or waits for the host to echo the characters. **Local Echo** [On] means that the emulator itself displays each character before sending it to the host and does not expect the host to echo it back.

If two characters appear on the screen, it indicates that both the emulator and the host

are echoing the character. In this case, local echo should be turned off at the workstation.

Line Termination Sequence

Specifies what character (or characters) replaces a carriage return (CR) just before it is sent to the host. When this property is [Off], the carriage return is sent unchanged. When this property is [On], the carriage return is replaced by the line termination sequence (LTS).

The LTS is inserted whenever a line break occurs in the VT100 window. This happens at the following times:

- When you copy text from a document, the LTS is inserted each time the current line is full or a new paragraph character is encountered.
- When you type a carriage return at the keyboard.

You can specify from one to eight octal characters, separated by spaces or commas, for the LTS. The legal octal values range from 0 to 377. The legal characters are the digits 0 through 7, a space, and a comma. If you enter an illegal value or character, you will not be able to close the property sheet until you correct the error.

These octal numbers represent any byte from the standard ISO 646 7-bit character set. Valid separator characters are spaces (" ") or commas (",") in any combination. A comma is legal after a number or space. For example, the following are valid sequences:

- 15,012,23 (=carriage return-linefeed-DC3)
- 015, 12 (=carriage return-linefeed)

- 23, 015,12 (=DC3-carriage return-linefeed, with any number of spaces)
- 23 (=DC3)
- 0 00 1 2 377 10 023 (=0,0,0,1,2,377,10,23)
- 015, 12, 23, 15 0 23 (combinations of blanks and commas=15,12,23,15,0,23)

The LTS is defined by the host computer to which the emulator connects. Therefore, you must enter an LTS that is legal for the host computer.

Alternate Keyboard

Selects which keyboard displays when you press the <Chg Kbd> virtual function key. If [Standard] is selected, the standard VT100 alternate keyboard displays. If [PCR] is selected, the Personal Computing Resource (PCR) auxiliary keyboard displays.

DEL/BS Key

Determines how the backspace key and the shift-backspace key will be represented. If you select [Delete], then <Shift> <Backspace> becomes the equivalent of the delete key, and <Backspace> becomes the equivalent of the backspace key. If you select [Backspace], this is reversed.

Display

Allows you to specify whether text is displayed immediately when it is sent to the display ([Always]), or whether text is accumulated and displayed as part of a background process ([When Possible]). This choice is available as an auxiliary menu command in the emulation window, as well as on the property and option sheets.

Language

Determines which character translations will be used.

Formatting

Allows you to specify that the terminal emulator will perform formatting operations to simulate much of the ViewPoint document format of the source text. It performs this formatting during move or copy operations into the terminal emulation window. It will also automatically insert an LTS at the end of each transmitted line.

Note: For **Formatting** to work correctly, the LTS must be set to [15,12].

Line Length

If you select **Formatting** [On], the **Line Length** property displays. This property allows you to specify the maximum number of characters per line, not including the LTS, for text copied or moved into the emulation window. The total line length is equal to the **Line Length** value plus the LTS. **Line Length** is independent of the **Screen Dimensions** property.

When this property is set and you copy or move text from a ViewPoint document, the emulator determines where a line break should occur. It keeps the line at or below the specified line limit and inserts an LTS at that point.

It is recommended that you prepare the source document in a fixed pitch font (for example, the Terminal 12 font). If you do this with margins and text equal to the **Line Length**, these line breaks should occur at approximately the same point in the destination text as in the source document.

This property will not affect the processing of text input from the keyboard.

The emulator does the following relative to various ViewPoint document conditions:

- If possible, lines are broken on a space, paragraph tab, normal tab, hyphen, or

discretionary hyphen character. These are referred to as line-break characters. If the line has no line-break characters, it is broken at the line limit.

- When the break would occur immediately after the line limit, the line is broken at the line limit. If the break occurs as a result of a space or tab, that character is discarded and the following character is placed in the first column of the next line.

- Paragraphs keyed without explicit new line characters are broken at the line-break character that appears closest to the line limit.

- If the source document has lines that are longer than the line limit setting, they are also broken at the line-break character that appears on or before the line limit. This will not be the same line breaking point seen in the open document.

Tab Simulation

If you select **Formatting** [On], the **Tab Simulation** property displays. This property determines whether or not the terminal emulator automatically converts tab characters to spaces for transmission to the host. When this property is set and you copy or move text into the emulation window, the emulator determines how many spaces to insert on the line so the next character properly aligns on the next tab stop, as determined by the source selection. If you have prepared the document in fixed pitch font, as recommended, the information formatted with tabs should appear much as it does in the displayed document.

When **Tab Simulation** is not selected and text is moved or copied from a ViewPoint document, both normal and paragraph tabs

are converted to the ISO 646 horizontal tab (HT) character.

This property does not affect the processing of text input from the keyboard.

Using the VT100 Terminal Emulator property and option sheets

You can use the VT100 Terminal Emulator property and option sheets to set properties and options both for the terminal emulator and for any TTY ports it contains. Settings on the property sheet are permanent: They remain from session to session. Settings on the option sheet are temporary: They remain for the duration of a session.

Setting TTY-Port properties and options through the terminal emulator property and option sheets is described in the chapter titled "TTY ports."

This section describes setting terminal emulator properties and options.

Setting VT100 properties on the property sheet

To set properties on the VT100 Terminal Emulator property sheet:

1. Select the VT100 Terminal Emulator icon and press <PROP'S>.
2. Select the desired properties.
3. Select [Done] in the window menu to close the property sheet and store any changes made. Select [Cancel] to close the property sheet without storing changes.

Setting VT100 options on the option sheet

To set options on the VT100 Terminal Emulator option sheet, first check the property sheet to assure that the **When Opening** property is set to [Display Options].

1. Select the VT100 Terminal Emulator icon and press <OPEN>.
2. Select the desired options.
3. Select [Start] in the window menu to begin a session using the options you have selected. Select [Cancel] to close the emulator icon without starting a session.

The options you select will only affect the current session. The next time you display the option sheet, it will show the same settings as the property sheet.

VT100 window

When an emulation session begins, the VT100 Terminal Emulator icon opens into a VT100 window (or "emulation window").

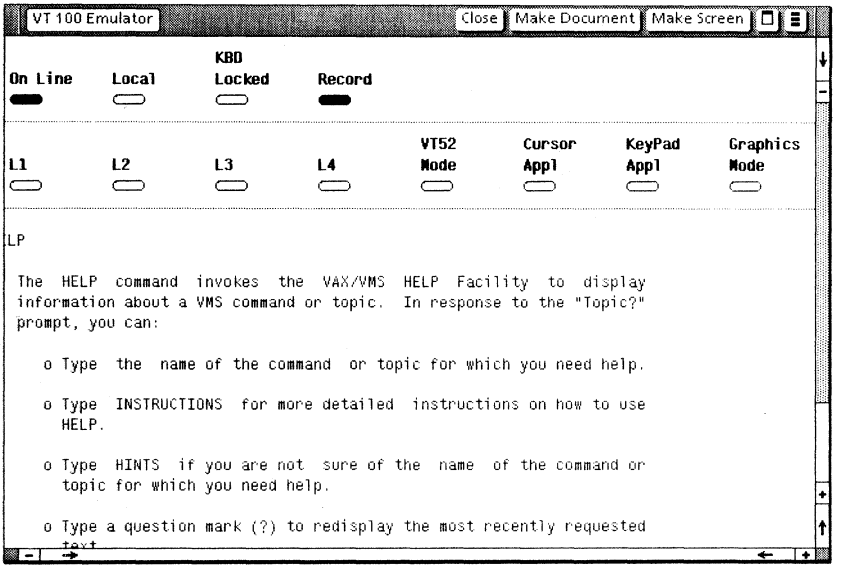
The VT100 window displays the data that travels to and from the host computer. It is divided into two areas: a status area and a main text area. Figure 4-4 shows a VT100 window with a session in progress.

Menu commands

In the gray bar at the top of the window are commands you can use to regulate the emulation session. Commands unique to VT100 emulation are described below:

[Make Document]
Creates a document containing all

Figure 4-4 **VT100 emulation window**



information appearing in the current screen plus all the information that has been scrolled off the screen since the last time [Make Document] was selected, provided that the [Record Data] command is also selected. The [Make Document] command is described in more detail in the "Transferring information" section later in this chapter.

[Make Screen]
Captures the information currently displayed on the screen and copies it into a document. The [Make Screen] command is described in more detail in the "Transferring information" section later in this chapter.

The following commands are found in the floating items auxiliary menu:

[Show Port Properties]
Displays, in read-only format, the property

sheet for the TTY port through which the connection was made.

[Enable/Disable Online]
Controls whether or not the information you type in the emulation window is conveyed to the host.

This command does not affect your connection to the host. Your workstation remains connected and continues to receive and process data from the host whether or not this command is enabled.

The Online LED indicator in the status area indicates if this command is enabled. If the LED is lit, the information you type in the emulation window is sent to the host; if the LED is not lit, the information you type in the emulation window is not sent to the host.

[Enable/Disable Local Echo]
Controls whether the emulator *echoes* (displays) the characters you type or waits for the host to echo the characters. If the Local Echo light indicator in the status area is lit, local echo is enabled, and the emulator echoes the characters you type. If the host echoes characters, local echo should be disabled.

[Reset Modes]
Sets the following VT100 modes to their off state: VT52, Cursor Appl, Keypad Appl, and Graphics Mode.

[Enable/Disable Autowrap]
Controls whether the VT100 automatically places a carriage return-linefeed combination at the end of a line. If autowrap is disabled and the last character position is reached on a line, the next character you type is displayed on top of the previous character.

[Enable/Disable Mouse Tracking]
Controls whether the terminal emulator sends VT100 cursor-positioning escape sequences

to the host to reposition the cursor to a point selected by the mouse. If mouse tracking is enabled, you can select anywhere in the window to change the current cursor position. If mouse tracking is disabled, you can select anywhere in the window to make the window active; then use the VT100 cursor keys to control the cursor.

[Record/Don't Record Data]
Determines whether data is recorded to a *backing document* for use by the [Make Document] command. Data is recorded as it is scrolled off the display. This command can be turned on and off at any time, and lets you stop recording data that does not need to be saved. Performance increases slightly when [Don't Record Data] is selected, because data is not being copied to the backing document. When [Record Data] is selected, data is placed in the backing document as it is scrolled out of the VT100 window.

Note: To improve performance, select [Don't Record Data] in the VT100 window floating item auxiliary menu if [Make Document] will not be selected in the current session.

[Display Always/Display When Possible]
Controls whether text displays immediately when sent to the emulation window, or whether it accumulates as part of a background process and is displayed when possible. If data from the host does not appear on your screen, select [Display Always].

[Enable/Disable PCR Option]
Controls which keyboard displays when you press the <Chg Kbd> virtual function key. If you enable the PCR option, the Personal Computing Resource (PCR) auxiliary keyboard

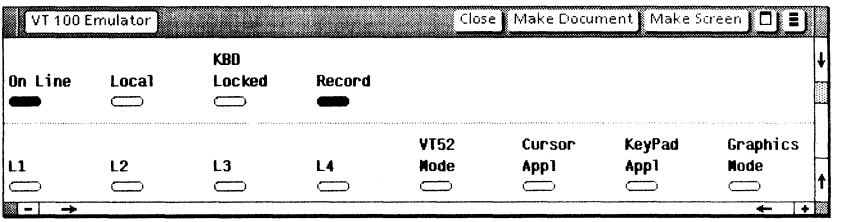
displays. If you disable the PCR option, the standard VT100 Alternate keyboard displays.

[Show Setup Sheet]
Displays the VT100 Set-Up property sheet.

Status area

Status area symbols provide visual feedback from the host. Information in the status area is displayed in a read-only format. During emulation, "light" indicators appear in the VT100 status area. A filled-in oval indicates that the light is on. Figure 4-5 shows the VT100 window status area.

Figure 4-5 **VT100 window status area**



Appendix F, titled "TTY status indicators," describes status indicators that appear for most TTY-type emulators. The VT100 emulator displays the following additional status indicators:

L1 through L4
Application programmable function "lights" are turned on and off by the host computer.

VT52 Mode
When on, it indicates that the emulator is operating in VT52 compatibility mode. When off, it indicates that the emulator is operating as a VT100.

Cursor Appl
When on, it indicates that the VT100 emulator is in cursor key mode.

KeyPad Appl
When on, it indicates that the VT100 emulator is in keypad application mode.

Graphics Mode
When on, it indicates that the VT100 emulator is using ISO character translations defined by the graphics code set. When off, it indicates the emulator is using ISO character translations defined by the **Language** property on the property sheet.

Main text area

All your interaction with the host is conducted inside the main text area. This area can contain up to 24 lines, each with the length set by the **Screen Dimensions** property on the VT100 Terminal Emulator property sheet. You enter text to this area directly from your keyboard or by copying or moving it from a document.

The terminal emulator places incoming characters at the cursor position. When the screen is full, the emulator scrolls up the contents of the window, one line at a time, when you press the carriage return or when it receives more data from the host.

Not all 24 lines may be visible if the window is smaller than its standard size. The emulator does not always keep the bottom line visible. Thus, if you are typing at the bottom of the text area, you may not see the line you are currently typing (or the host's response). However, you can always display it by using the window scroll bars or adjusting the size of the window.

VT100 virtual keys

When you click the left mouse button within the emulation window, the emulation window becomes *active*. The emulator software displays a set of virtual function keys at the bottom of your screen. These keys include <Break> and <Escape>. The emulator also remaps the workstation's keyboard to represent the keyboard and functions normally found at a VT100 terminal.

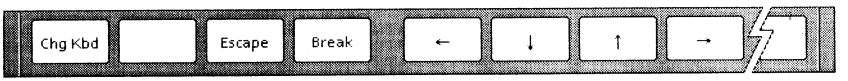
Besides the virtual function keys that are displayed automatically, you can display the keyboard's new meanings on the screen in a virtual keyboard window. This gives you full access to all ASCII control codes.

VT100 emulation uses two virtual keyboards: the main TTY alphanumeric keyboard used by all asynchronous type terminals and an alternate keyboard. Additionally, a PCR auxiliary keyboard is available when the Personal Computing Resource (PCR) feature is used. These keyboards are described in the following sections.

VT100 virtual function keys

The set of virtual function keys that first displays is shown in Figure 4-6 and explained below.

Figure 4-6 **VT100 virtual function keys**



Note: Key labels and positioning are different for the 6085 and 8010 workstations.

The VT100 virtual function keys include:

<Chg Kbd>
Used to go between the main and alternate VT100 keyboards. If the key is pressed and released, the keyboard is redefined to the alternate keyboard (or to the main keyboard, if it was previously defined as the Alternate keyboard).

This key can be held down while one or more keys are pressed, allowing quick access to the other keyboard. In this case, when this key is released, the keyboard returns to its previous definition.

<Alt>
Used to interface with a VT100-compatible PC, if available.

<Escape>
Equivalent to the actual VT100 <Escape> key.

<Break>
Equivalent to the actual VT100 <Break> key.

Arrow keys
Equivalent to the actual VT100 cursor control keys.

VT100 Main keyboard

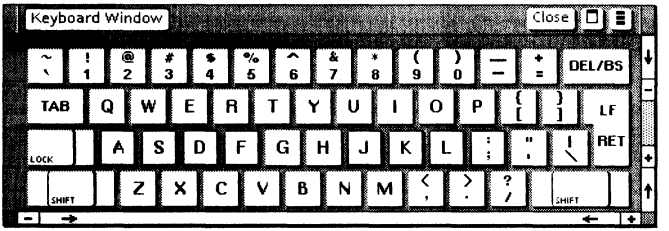
When the emulation window is active, you can display the VT100 Main keyboard by simultaneously pressing the <KEYBOARD> key and the function key corresponding to <Show>.

To use the VT100 Main keyboard, press the real key corresponding to the position of the desired key in the virtual keyboard display.

Figure 4-7 illustrates the VT100 Main keyboard for the 6085 workstation.

Note: For the 8010 workstation, the para-tab key is equivalent to <Ctrl>. For the 6085

Figure 4-7 **VT100 Main keyboard (6085 workstation)**



workstation, <KEYBOARD> (not shown) is equivalent to <Ctrl>.

Select anywhere outside the emulation window to return the keyboard to its original meanings.

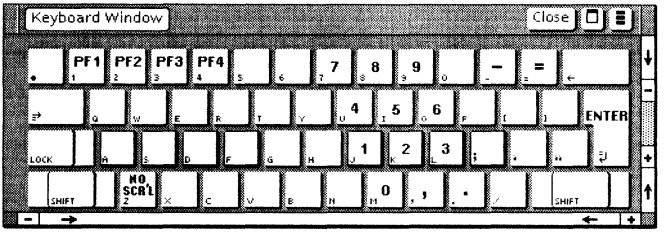
Note: While the emulation window is active, you can change the meaning of the keyboard to an inappropriate setting by pressing <KEYBOARD> and selecting a different setting. For example, you can select the ViewPoint Office keyboard setting while the emulation window is active. However, when you type inside the window, characters without equivalents in the VT100 character set appear as question marks.

VT100 Alternate keyboard

The VT100 Alternate keyboard contains the numeric keypad, four function keys, and several other keys that appear on a regular VT100 terminal but do not appear on the main virtual keyboard. These VT100 keys send escape sequences required by the host. Figure 4-8 illustrates the VT100 Alternate keyboard.

Appendix C contains tables that describe the escape sequences sent by the VT100 Alternate keyboard.

Figure 4-8 **VT100 Alternate keyboard (6085 workstation)**



To use the VT100 Alternate keyboard:

1. Select inside the VT100 window.
2. Press the <KEYBOARD> key and the virtual function key labeled <Show> for a visual representation of the keyboard.
3. Press the VT100 virtual function key labeled <Chg Kbd>. Pressing the <Chg Kbd> function key switches the virtual keyboard meanings from the VT100 Main keyboard to the VT100 Alternate keyboard.
4. Press the desired emulation key.
5. Press the function key corresponding to <Chg Kbd> again to return to the VT100 Main keyboard.

Note: While using the VT100 Main keyboard, you can press the function key corresponding to <Chg Kbd> to temporarily use the VT100 Alternate keyboard for a few key strokes. Release <Chg Kbd> to return the keyboard to its initial state.

Refer to Appendix C for more information on the VT100 Alternate keyboard.

PCR Auxiliary keyboard

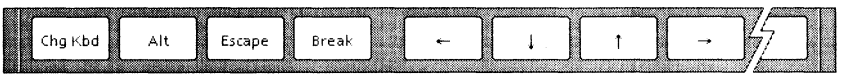
The PCR Auxiliary keyboard contains VT100 keys, IBM PC keys, and ten additional keys, labeled X1 through X10. The "X" keys send escape sequences that are not provided by the other keys. These escape sequences are shown in Appendix C.

You can use the PCR Auxiliary keyboard for two purposes:

- To exchange data with a VT100-compatible PC. In this type of session, the PC acts as the host computer.
- To communicate with applications or equipment requiring more keys than are present on the VT100 and PC.

When an emulation window is active and the PCR feature is enabled, <Alt> appears on the second virtual function key (see Figure 4-9). The <Alt>

Figure 4-9 **VT100 virtual function keys (PCR enabled)**



virtual function key is the equivalent of the Alt key on the IBM PC keyboard.

Enabling the PCR feature

You can enable the PCR feature in one of two ways:

- By selecting [PCR] for the **Alternate Keyboard** property on the VT100 Terminal Emulator property sheet.

- By selecting [Enable PCR Option] on the floating items auxiliary menu after a session is established.

Using the PCR feature

To use the PCR Auxiliary keyboard:

1. Select inside the VT100 window.
2. Holding down <KEYBOARD>, select the function key corresponding to <Show> for a visual representation of the keyboard.
3. Press the virtual function key labeled <Chg Kbd>.
4. Press the desired key.
5. Press the virtual function key labeled <Chg Kbd> to return to the main keyboard.

Refer to Appendix C for information about the PCR Auxiliary keyboard and the escape sequences it sends.

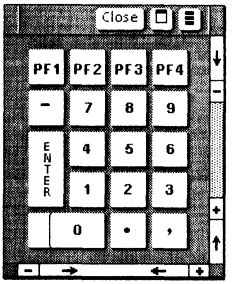
Ten-Key Pad

On the 6085 workstation, when you display the VT100 Main keyboard, the Ten-Key Pad window displays beside it. On the 8010 workstation, when you display the VT100 Main keyboard, two key pad windows display beside it: the regular 8010 key pad and the Ten-Key Pad.

The Ten-Key Pad has the same functions as the VT100 Alternate keyboard. Using this key pad eliminates the need to swap between the VT100 Main and the VT100 Alternate keyboards during an emulation session.

Figure 4-10 illustrates the VT100 Ten-Key Pad window.

Figure 4-10 **VT100 Ten-Key Pad**



To display the Ten-Key Pad window:

1. Select inside the emulation window.
2. Hold down the <KEYBOARD> key.
3. Press the function key corresponding to <Show>.
4. Release both keys.

A visual representation of the Ten-Key Pad appears next to the VT100 Main keyboard.

On a 6085 workstation, you can either use the physical key pad on the keyboard or you can select within the Ten-Key Pad window with the mouse to enter characters shown in the Ten-Key Pad window.

On an 8010 workstation, select within the Ten-Key Pad window with the mouse.

Control of the cursor

The VT100 emulator cursor appears as an underscore or, optionally, as a hollow rectangle (corresponding to a VT100 block cursor). The emulator cursor appears in the emulation window at all times.

The cursor marks the position where the next input character is inserted. Its location is set by the host computer, the mouse cursor, or the cursor-control keys.

Entering information

You can enter information at the cursor location only when the VT100 window is active. "Active," in this sense, means that the current type-in point is inside the emulation window: The characters you type appear in the window.

To make the window active, move the mouse inside it and click the left mouse button.

When the emulation window is not active, the host computer can still send data to display in the emulation window. When the host computer sends data to the workstation, it sets the emulator cursor independently of the workstation's current type-in point. Thus, you can continue to work in another window despite activity within the emulation window. However, for you to enter characters in the window, you must reactivate the window by clicking the left mouse button inside it.

When the window is active, the cursor is black. When the window is not active, the cursor is gray.

Mouse tracking

If [Enable Mouse Tracking] is selected in the floating items auxiliary menu, you can use the mouse to set the emulator cursor to any character location in the window. You do this by pressing the left mouse button and moving the mouse to the desired location.

The emulator cursor changes to a temporary gray box as it tracks the mouse. This gray box is called the "mouse cursor."

When you release the left button, the VT100 cursor moves to the new position. This is similar to using the VT100 cursor-control keys.

When the current selection is inside a VT100 window and mouse tracking is enabled, you can use either the mouse cursor or the cursor-control keys to position the emulator cursor. Whenever the emulator cursor is moved, the cursor-control sequence specifying the new location is sent to the host computer.

When you use mouse tracking, if you move the mouse outside the VT100 window while pressing the left button, the emulator cursor remains in its original position. Any subsequent keystrokes are entered at the current selection within the window.

When [Disable Mouse Tracking] is selected in the floating items auxiliary menu, no random cursor movement is possible. Pressing a mouse button anywhere in the emulation window changes the selection to the window but does not affect the current cursor position.

When [Enable Mouse Tracking] is selected, if you want to select inside the emulation window without sending cursor-positioning escape sequences to the host, you must select the current cursor position.

Cursor control keys

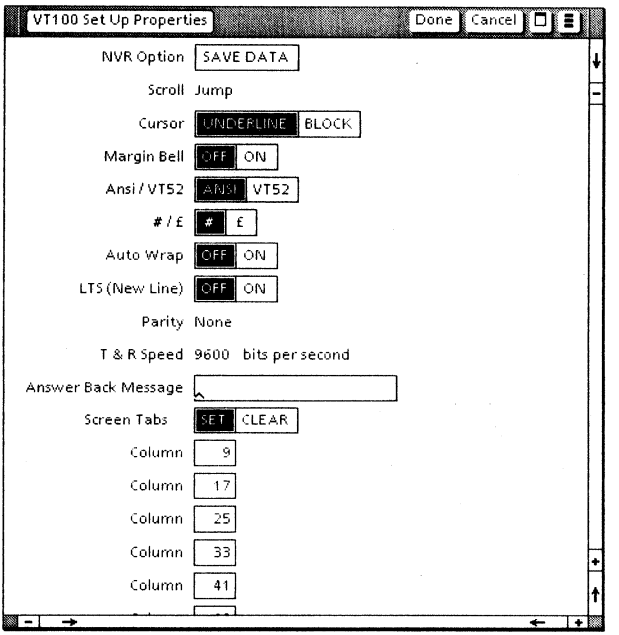
To use the cursor control keys to move the cursor, hold down the cursor control key labeled with the desired directional arrow: The cursor movement repeats until you release the key.

VT100 Set-Up properties sheet

You can use the VT100 Set-Up properties sheet to view certain terminal properties and to change others any time during an emulation session. On

a VT100 terminal, this feature is known as set-up mode and is normally divided into two screens: set-up A and set-up B. The VT100 Set-Up properties sheet combines this information and includes, in read-only format, properties that appear on the TTY-Port and VT100 Terminal Emulator property sheets. Figure 4-11 shows the VT100 Set-Up properties sheet.

Figure 4-11 **VT100 Set-Up properties sheet**



Set-up properties

VT100 set-up properties are explained below:

NVR Option
Nonvolatile memory (NVR) allows the set-up properties to be used for the current session or to be saved across sessions. Select [Save Data] to save the most often used property settings. You can also make temporary changes in those properties for the current session. The **NVR Option** directly emulates the set-up save operation into NVR on the real VT100.

Note: If [Save Data] is selected, all information in the VT100 Set-Up property sheet is saved as part of the icon's permanent data.

Scroll
[Jump] is the only type of scrolling available. Upward scrolling places blank lines at the bottom of the scrolling region line by line. Downward scrolling places blank lines at the top of the scrolling region line by line. Lines scrolled off the screen can be placed in a file that is used by the [Make Document] command.

Cursor
Provides a choice of two cursor shapes: underline (_) or open block (□).

Margin Bell
Turns the margin bell on or off. The bell provides a warning sound when the cursor is eight characters from the end of the line.

ANSI/VT52
Switches the emulator to an ANSI (American Nation Standards Institute) or a VT52 terminal.

#/£
Determines what character appears when

<SHIFT> and <3> are pressed. There are two settings available: # and £.

Auto Wrap
Inserts a carriage return-linefeed combination when a line in the window becomes full. When **Auto Wrap** is [On] and the last character position is reached, the next character received is automatically placed in the first character position of the next line.

Note: If this property is not selected and the last character position is reached, the next character typed in displays on top of the previous character (overwrites).

LTS (New Line)
This property is the same as the **Line Termination Sequence** (LTS) on the icon's property sheet. It provides an alternative means for changing the setting of this feature during a session. When this feature is on, the LTS is sent to the host instead of carriage returns. This property replaces the VT100's new line set-up feature, replacing incoming linefeed characters with carriage return-linefeed when it is selected.

Parity
Provides the parity setting for the current session, in read-only format, based on the property set on the TTY-Port property sheet.

T & R (transmit and receive) **Speed**
Displays the line speed in read-only format. (The **Line Speed** property is set on the TTY-Port property sheet.)

Answer Back Message
Allows a message of up to 20 characters, including spaces and control characters, to be sent to the host computer when the host sends an ENQ signal.

Screen Tabs
This property allows you to view and change the location of tab stops for columns on a

line. You can change tabs individually or totally clear and reset them. Select [Set] to set the position of tab stops. Only positive values are acceptable. The first box on the property sheet represents the first tab stop; the second box represents the second tab stop; and so on. After all tabs are set, a blank box appears when <NEXT> is pressed. Up to 132 tab stops can be set.

Note: It is not possible to set a tab stop beyond the specified screen width set in the option or property sheet.

Select [Clear] to clear all tab settings. This property, like [Set], is applied only when [Close] is selected. Thus, even though the list of tabs disappears when [Clear] is selected, it may be quickly restored by selecting [Set] as long as [Done] has not yet been selected.

These tab settings are not to be confused with the tab settings obtained during a move or copy operation, in which tab stops are interpreted from the source selection.

Changing set-up properties during a session

To change properties during an emulation session:

1. Select [Show Setup Sheet] in the floating items auxiliary menu.
2. Select the desired properties.
3. Select [Save Data] if changes are to be retained; if [Save Data] is not selected, changes last only for the duration of the emulation session.
4. Select [Done] to close the property sheet and apply the selected properties, or select

[Cancel] to close the property sheet without applying the changes.

Transferring information

During a session, you transfer information to and from the host. You can also use workstation VT100 emulation to transfer information to and from another workstation. This section describes copying and moving text from your desktop to the emulation window, as well as exchanging data with another workstation. It then describes the [Make Document] and [Make Screen] commands that you use to capture information from the host.

Copying and moving text to the host

The emulator allows you to transfer text from desktop documents to a host computer:

1. Select the desired text that is to be transferred.
2. Press <COPY> or <MOVE> as appropriate.
3. Select the destination inside the VT100 window. The cursor marks the location in which the next character will be inserted.

When you move or copy information into a VT100 window, the following changes take place:

- Character properties are ignored.
- Characters or symbols without emulation equivalents appear as question marks.
- New line and new paragraph characters are converted to standard carriage returns.

The amount of text that can be copied or moved into a window varies between host systems.

If [Enable Mouse Tracking] is not selected in the floating items auxiliary menu, text copied or moved into the VT100 window always appears at the cursor location. Cursor-control escape sequences are not sent to the host during a copy or move operation to a VT100 window.

If [Enable Mouse Tracking] is selected in the auxiliary menu, the appropriate cursor-control escape sequences cause the cursor to move to the new selected location before the move or copy operation occurs.

CAUTION: If the host computer does not support flow control (or if the host supports it, but it is not properly selected on the TTY-Port property sheet), a copy or move operation may result in data lost at the host. A move operation also deletes the source text at the workstation: Thus data can be permanently lost.

When **Formatting** is selected in the property or option sheet, lines in the document are broken at space, paragraph, paragraph tab, normal tab, hyphen, or discretionary hyphen characters if at all possible. These are referred to as line break characters. Line break conditions are described under **Line Length** in the section of this chapter called "VT100 Terminal Emulator property and option sheets."

Terminal-to-terminal communication using workstation VT100 emulation

When you use workstation VT100 emulation (with Local RS232C Communication Access), you can exchange data with another user at a TTY-type terminal or terminal emulator. In this type of a session, neither end acts as the host: The terminal users at each end can send data to be displayed in the other user's emulation window.

To receive incoming calls from another terminal:

1. You and the sender first must agree on parameter settings for the workstation local

port, such as **Line Speed** and **Character Length**.

2. Copy a workstation local port with the agreed upon settings onto the VT100 Emulator icon.

3. Open the VT100 Emulator icon.

4. The sender dials the number of the phone that is connected via modem to your workstation, thus connecting to your emulator.

5. Switch the modem to Data. The information from the sender is transferred into the emulation window. You can then use [Make Document] or [Make Screen] to place the information in a document.

You can also connect two neighboring workstations by attaching a null modem cable to their RS232C ports.

Make Document: Transferring VT100 information to document form

When you select [Make Document], information from the emulation window is transferred into a document. All information appearing on the current screen, plus all the information that has been scrolled off the screen since [Make Document] was last selected, is transferred.

Thus, if you use [Make Document], then scroll to another screenful of information and repeat [Make Document], you will obtain two copies of the first screen: one at the end of the first document and another at the beginning of the second document. In the first document, the screen is the last information captured; in the second document, that screen has become part of the information scrolled off the screen since [Make Document] was last invoked.

To use [Make Document], you must have the *VP Document Editor* running in your loader.

[Record Data] must be selected in the floating items auxiliary menu before [Make Document] can be selected. Any information scrolled off the screen before [Record Data] is selected is lost. Thus, you can use [Record Data] to limit the amount of data captured, turning it on before and off after the specific lines you want recorded.

To transfer information from an emulation window, select [Make Document] in the window header. The transferred information appears as an icon with a name and a time stamp. For example:

1200B-VAX of 4-MAR-88 11:46:52PST

The length of the icon name determines whether or not the time stamp will show. If the emulator name contains over 50 characters, the emulator icon name is truncated in the name of the resulting document. In that case, the document icon name contains the first 50 characters, an ellipsis (. . .), and a time stamp:

<name> . . . <time stamp>

Notes:

- Character properties, such as bold-facing or underlining, are not preserved when [Make Document] is selected.
- Pressing <STOP> interrupts the [Make Document] process; however, any information being transferred to the document may be lost or incomplete.
- The host application may define a "scrolling region" anywhere on the screen. Therefore, the result of a [Make Document] command might not match the appearance of the screen at any particular time.

Make Screen: Transferring a VT100 screen to document form

When you select [Make Screen], a single screen of information is transferred from the emulation window into a document.

To use [Make Screen], you must have the *VP Document Editor* running in your loader.

To transfer information from an emulation window, perform the operations necessary to display the desired information on the screen, and then select [Make Screen] in the window header. This information appears as a document icon with the VT100 icon's name and a time stamp. The rules for the formation of the document icon name are the same as for the [Make Document] icon described above.

The [Make Screen] feature preserves character properties, such as bold-facing and underlining. However, it does not preserve double height, double width, or reverse video.

Pressing <STOP> interrupts the [Make Screen] process; however, any information being transferred may be lost or incomplete.

Using captured information

Once you capture information using [Make Document] and [Make Screen], you can manipulate the resulting document as you would any other document. This includes printing, filing, formatting, editing, and mailing.

You can use *VP Data Capture* to run such information through a program that formats it as a table. This feature allows you to transfer data easily into record files or bar charts. *VP Data Capture* is described in a separate part of this volume.

5. VP Terminal Emulation of Tektronix 4014

The *VP Terminal Emulation of Tektronix 4014* enables your workstation to function as a Tektronix 4014 terminal. Once your workstation establishes a connection with the host, you can use your keyboard to send commands and keystrokes to the host.

The Tektronix 4014 emulator communicates through TTY ports. Before you use the emulator, you first configure both TTY-port and Tektronix 4014 emulator software by specifying properties on their property sheets.

To understand and use this product, first read the chapter titled "TTY ports" in this volume. It tells you how to load and configure TTY-port software and how to conduct an emulation session using TTY ports.

Key concepts of Tektronix 4014 terminal emulation

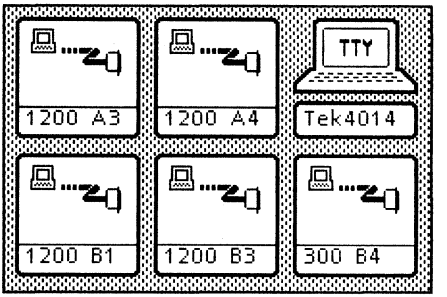
To use the Tektronix 4014 emulator, you retrieve and configure appropriate icons, begin a session with the host computer, and use an emulation window and virtual keyboards to communicate with the host.

Emulation icons

For Tektronix 4014 emulation, you retrieve icons for both the TTY port and the emulator. Figure 5-1 shows the Tektronix 4014 Terminal Emulator

and TTY-Port icons as they might appear on your desktop.

Figure 5-1 **Tektronix 4014 emulation icons**



You can perform the following actions on your emulation icons:

- You can associate a TTY port (or ports) with the terminal emulator by copying or moving the TTY-Port icon onto the emulator icon. The emulator icon then "contains" the port. (The emulator connects to the host through the ports it contains.)
- You can define certain characteristics of the terminal emulator and the ports it contains by specifying properties and options on the terminal emulator property and option sheets.
- You can define port characteristics by specifying properties on the TTY-Port property sheet. You can display and modify this sheet either by selecting the TTY-Port icon on your desktop or from within the terminal emulator property or option sheet.

Key concepts of a session

To begin a session with the host, you open the terminal emulator icon. The session either begins automatically or the terminal emulator option sheet appears, depending on whether or not you

have selected **Display Options** on the emulator's property sheet.

If the option sheet displays, you can specify options for the session. You can also display the TTY-Port property sheet from the terminal emulator option sheet and select port properties for the session.

When you finish selecting options, select [Start]. The terminal emulator connects to the host and opens an emulation window. You use this window to exchange information with the host.

After the session begins, you can use menu commands to further control the software.

During the session, the terminal emulation software translates your keystrokes into the key codes that the Tektronix 4014 terminal would send to the host.

To end a session, you log off the host and close the emulation window.

You can find step-by-step instructions on conducting a session in the "TTY ports" chapter of this guide.

Constraints

The *VP Terminal Emulation of Tektronix 4014* has the following limitations:

- Only the International Standards Organization (ISO) 646 7-bit code character set interchange is supported. (ASCII is a subset of this character set.)
- The emulator does not always display the current type-in point (such as the bottom line). You can always display the current type-in point by scrolling the window.

- Information within the emulation window cannot be directly copied or moved to another location, either within the emulation window or outside it. (You can use the [Make Screen] command, described later in this chapter, to capture information and graphics from the emulation window; then copy or move the captured information as you would from any ViewPoint document.)

- The *VP Document Editor* limits the number of "graphics objects" (such as lines and points) in a frame to approximately 4000. If you make a document from a graphics display containing more than 4000 objects, the emulator copies as much as possible and then displays an error message.

Tektronix 4014 Terminal Emulator icon

The Tektronix 4014 Terminal Emulator icon behaves as both a functional icon and a ViewPoint container. This means, in part, that its property and option sheets provide two displays: (1) a set of properties or options that define the terminal emulator software and (2) a display of the TTY-Port icons that have been moved or copied into the terminal icon.

As a functional icon, the Tektronix 4014 Terminal Emulator icon can be used to configure and run the software associated with it. When you select [Properties] on the property sheet or [Options] on the option sheet, the properties or options you use to configure the software are displayed.

The terminal icon as a container

When you select [Ports] at the top of either the Tektronix 4014 property or option sheet, the contents of the "container" are displayed: a list of TTY ports. When you start the terminal emulation

software, it interprets this list as the ports to try, in order, until it successfully reaches a host.

The terminal emulator Ports display looks and acts like an unsorted folder; however, only TTY-Port icons can be moved or copied into it. In addition, it functions somewhat differently when viewed through the option sheet rather than the property sheet. Functional differences are described later in this section.

Port order

The order of ports within the terminal emulator icon is significant: It is the order in which the terminal emulator will try to use each port to make a connection. You can cause the terminal emulator to try the same port several times by having multiple copies of that port within the terminal container. The emulation software will try each enabled port, in order, either until a connection through one is successful or until all ports have been unsuccessfully tried.

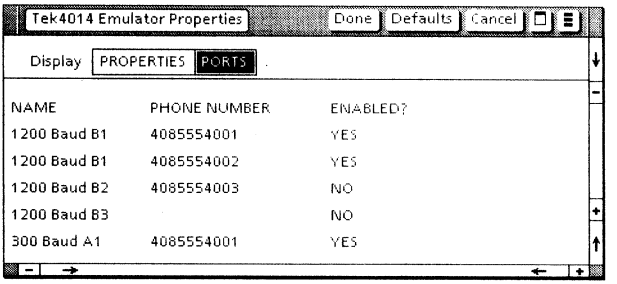
You can enable and disable the port by using the [Enable Port] and [Disable Port] commands in the window's auxiliary menu or the **Enabled** property on the port's property sheet.

Figure 5-2 shows an example of a terminal emulator icon property sheet displaying the ports contained in the icon. In this example, the terminal emulator will first attempt a connection through the port called 1200 Baud B1. It will then try the same port again to a different host phone number. Then, after skipping B2 and B3, the emulator will try the slower 300 Baud A1.

Terminal container property sheet operations

Any function that you can perform on port icons outside of the terminal property sheet Ports display you can also perform within it, such as <PROP'S>, <COPY>, and <MOVE>. All changes made to the Ports display when shown

Figure 5-2 **Tektronix 4014 properties sheet Ports display**



through the terminal "container" property sheet are remembered the next time you display the terminal property sheet or open the terminal icon to establish a session.

If you select the [Cancel] command in the property sheet window header, none of the changes you made in the container are kept. This means that a port you have moved into the container will be lost. If you use the <MOVE> key to place a port within the container and then select [Cancel], the emulation software asks you to confirm the [Cancel] operation.

Terminal container option sheet operations

Changes you make to the contents of the terminal option sheet are in effect only for the current emulation session. For terminal properties and ports to be permanent, they must be changed through the property sheet. Not all container operations can be done through the option sheet, as it is meant only to affect the current session. Table 5-1 describes the behavior of different container operations performed within the terminal icon option sheet.

Table 5-1 **Operations within the option sheet container window**

Operation	Allowed?	Behavior
Copy a port into the container	yes	Port shows up on the display, and is used when attempting connection, but does not reappear when the container is reopened.
Move a port into the container	no	—
Copy a port out of the container	yes	A copy of the port is placed where indicated outside the container.
Move a port out of the container	no	—
Delete a port from within the container	no	—
Move a port to a different position within the container	yes	Port moves within the folder, and its new position is used when attempting connection; port returns to its original position when the container is reopened.
Copy a port already in the container, placing the copy elsewhere in the container	yes	A copy of the port is placed where indicated in the container, but does not reappear when the container is reopened.
<PROP'S> on a port within the container	yes	Any changed TTY-port options will affect the current session, but will return to their previous values once the container is closed.
[Enable/Disable Port]	yes	Will change the **Enabled** option of the TTY-port as requested, but the option returns to its previous value once the container is closed.

Retrieving the Tektronix 4014 Terminal Emulator icon

To use the Tektronix 4014 terminal emulation software, you first must run *Asynchronous Terminal Basic Software* in the Application Loader. Then load and run *VP Terminal Emulation of Tektronix 4014*.

After running the software, retrieve a copy of the terminal icon to your desktop. To retrieve an icon:

1. Open the Workstation divider in the Directory divider.
2. Open the Terminal Emulators divider, which contains an icon for each VP terminal emulator running in your loader.
3. Copy the Tektronix 4014 Emulator icon to your desktop.

You can copy multiple icons to your desktop. You can then configure each one to represent different terminal characteristics (such as screen width), a connection to a different port (or set of ports), or a connection to a different host computer. You do this by copying or moving TTY-Port icons into the terminal emulator icon.

After you configure terminal emulation properties for the terminal icon and the ports it contains, you will use the icon to start a session with the host.

Tektronix 4014 Terminal Emulator property and option sheets

Tektronix 4014 Terminal Emulator property and option sheets define the functional characteristics of your terminal emulation window.

The Tektronix 4014 terminal Emulator option sheet is the same as the property sheet with these exceptions:

- The **Icon Name** field displays in read-only format.
- The **When Opening** property does not appear.
- The [Start] command appears at the top of the option sheet window instead of the [Done] command.

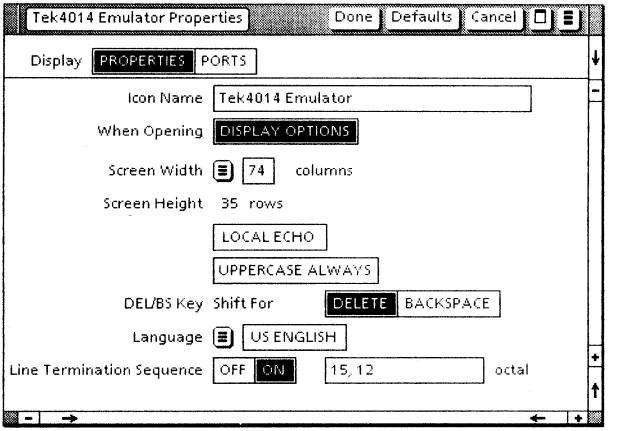
All terminal emulator properties selected on the property sheet are retained until changed or until the icon is deleted.

Figure 5-3 shows an example of a Tektronix 4014 Terminal Emulator property sheet. You can refer to it as you read the following property descriptions.

Icon Name

Allows you to uniquely name each terminal emulator icon. The name can be from 1 to 100 characters long. The first few characters will appear on the face of the icon on the desktop.

Figure 5-3 **Tektronix 4014 Emulator properties sheet**



When Opening

Determines whether or not the option sheet displays when you open the terminal emulator icon. If you select [Display Options], the option sheet displays when you open the icon.

If you do not select [Display Options], the option sheet does not display, and the option settings from the property sheet apply to the session.

Screen Width

Allows you to select the screen width and to display the number of screen rows in read-only format. The screen width is the number of characters (or "columns") that will fit on one line in the window. You can specify [74], [81], [121], or [133].

Each column width on the Tektronix 4014 is associated with one of four specific Tektronix 4014 fonts. These fonts will be mapped to two terminal display fonts as shown in Table 5-2.

Table 5-2 **Tektronix 4014 screen fonts**

Characters per line	Lines per page	Characters per display	Character size (mil)	Display font used	ViewPoint document font
74	35	2590	160 x 195	Terminal 12	Modern 12
81	38	3078	145 x 175	Terminal 12	Modern 10
121	58	7018	95 x 115	Terminal 8	Modern 8
133	64	8512	90 x 110	Terminal 8	Modern 6

Screen Height

Once you select the screen width, the software sets the number of lines (or "rows") per screen and displays this number as the screen height. The number of rows corresponding to the four screen-width choices are: [35], [38], [58], and [64] respectively.

Local Echo

Specifies whether the emulator echoes (displays) the characters typed in, or waits for the host to echo the characters. **Local Echo** [On] means that the emulator itself displays each character before sending it to the host and does not expect the host to echo it back.

If two characters appear on the screen, it indicates that both the emulator and the host are echoing the character. In this case, local echo should be turned off at the workstation.

Upper Case Always

Causes all lowercase alphabetic characters

(a-z) to be translated to their uppercase counterparts (A-Z) before they are sent to the host. This applies to all ViewPoint characters that have an uppercase equivalent. When no uppercase equivalent exists, the lowercase character is used. This mapping applies to characters entered into the Tektronix 4014 window from both the keyboard and from move or copy operations.

DEL/BS Key

Determines how the backspace key, and the shift-backspace key will be represented. If you select [Delete], then <Shift> <Backspace> becomes the equivalent of the delete key, and <Backspace> becomes the equivalent of the backspace key. If you select [Backspace], this is reversed.

Language

The standard Tektronix 4014 terminal provides the full ASCII character set (94 printing characters), which is restricted to US English. The **Language** property should always be set to [US English].

If a different language is chosen, character codes are translated to and from the corresponding ViewPoint characters by the translation tables in the data file TTYTranslations. As the Tektronix 4014 emulation does not actually support languages other than US English, this can yield unexpected results.

Line Termination Sequence

Specifies what character, or characters, will replace a carriage return (CR) just before it is sent to the host. When this property is [Off], the carriage return is sent unchanged. When this property is [On], the carriage return is replaced by the line termination sequence (LTS). The LTS for the Tektronix 4014 is a CR (octal = 15).

The LTS is inserted whenever a line break occurs in the Tektronix 4014 window. This happens at the following times:

- When you copy text from a document, the LTS is inserted each time the current line is full or a new paragraph character is encountered.
- When you type a carriage return at the keyboard.

You can specify from one to eight octal characters, separated by spaces or commas, for the LTS. The legal octal values range from 0 to 377. The legal characters are the digits 0 through 7, a space, and a comma. If you enter an illegal value or character, you will not be able to close the property sheet until you correct the error.

These octal numbers represent any byte from the standard ISO 646 7-bit character set. Valid separator characters are spaces (" ") or commas (",") in any combination. A comma is legal after a number or space. For example, the following are valid sequences:

- 15,012,23 (=carriage return-linefeed-DC3)
- 015, 12 (=carriage return-linefeed)
- 23, 015,12 (=DC3-carriage return-linefeed, with any number of spaces)
- 23 (=DC3)
- 0 00 1 2 377 10 023 (=0,0,0,1,2,377,10,23)
- 015, 12, 23, 15 0 23 (combinations of blanks and commas=15,12,23,15,0,23)

The LTS is defined by the host computer to which the emulator connects. Therefore, you

must enter an LTS that is legal for the host computer.

Using the Tektronix 4014 Terminal Emulator property and option sheets

You can use the Tektronix 4014 Terminal Emulator property and option sheets to set properties and options both for the terminal emulator and for any TTY ports it contains. Settings on the property sheet are permanent: They remain from session to session. Settings on the option sheet are temporary: They remain for the duration of a session.

Setting TTY-port properties and options through the terminal emulator property and option sheets is described in the chapter titled "TTY ports."

This section describes setting terminal emulator properties and options.

Setting Tektronix 4014 properties on the property sheet

To set properties on the Tektronix 4014 Terminal Emulator property sheet:

1. Select the Tektronix 4014 Terminal Emulator icon and press <PROP'S>.
2. Select the desired properties.
3. Select [Done] in the window menu to close the property sheet and store any changes made. Select [Cancel] to close the property sheet without storing changes.

Setting Tektronix 4014 options on the option sheet

To set options on the Tektronix 4014 Terminal Emulator option sheet, first check the property sheet to assure that the **When Opening** property is set to [Display Options].

1. Select the Tektronix 4014 Terminal Emulator icon and press <OPEN>.
2. Select the desired options.
3. Select [Start] in the window menu to begin a session using the options you have selected or select [Cancel] to close the emulator icon without starting a session.

The options you select will only affect the current session. The next time you display the option sheet, it will show the same settings as the property sheet.

Tektronix 4014 window

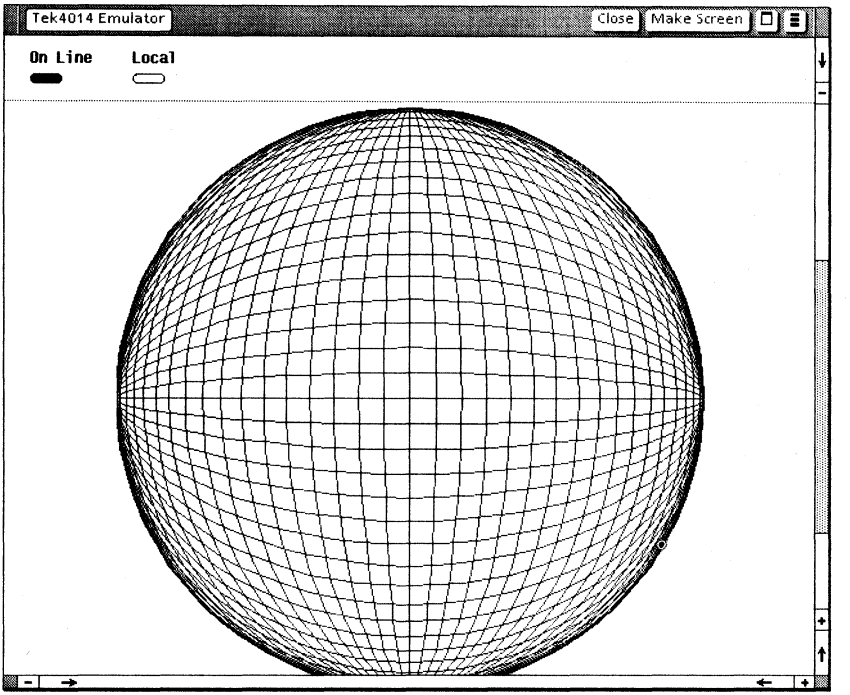
When an emulation session begins, the Tektronix 4014 Terminal Emulator icon expands into a Tektronix 4014 window (or "emulation window").

The Tektronix 4014 window displays the data that travels to and from the host computer. It is divided into two areas: a status area and a main text area. Figure 5-4 shows a 4014 window with a session in progress.

Menu commands

In the gray bar at the top of the window are commands you can use to regulate the emulation session. Commands unique to Tektronix 4014 emulation are described below:

Figure 5-4 **Tektronix 4014 emulation window**



[Make Screen]
Captures the information currently displayed on the screen and copies it into a document. The [Make Screen] command is described in more detail in the "Transferring information" section later in this chapter.

The following commands are found in the floating items auxiliary menu:

[Show Port Properties]
Displays, in read-only format, the property sheet for the TTY port through which the connection was made.

[Enable/Disable On-Line]
Controls whether or not the information you

type in the emulation window is conveyed to the host.

This command does not affect your connection to the host. Your workstation remains connected and continues to receive and process data from the host whether or not this command is enabled.

The On line light indicator in the status area indicates if this command is enabled. If the light is lit, the information you type in the emulation window is sent to the host; if the light is not lit, the information you type in the emulation window is not sent to the host.

[Enable/Disable Local Echo]
Controls whether the emulator echoes (displays) the characters you type or waits for the host to echo the characters. If the Local Echo light indicator in the status area is lit, local echo is enabled, and the emulator echoes the characters you type. If the host echoes characters, local echo should be disabled.

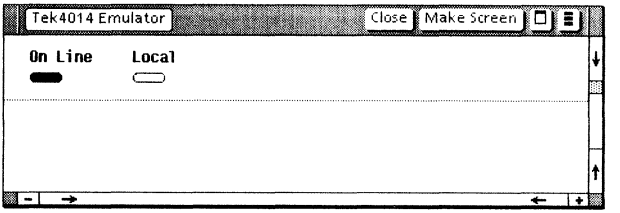
Status area

Status area symbols provide visual feedback from the host. Information in the status area is displayed in a read-only format. During emulation, "light" indicators appear in the Tektronix 4014 status area. A filled-in oval indicates that the light is on. Figure 5-5 shows the status area of a 4014 window.

The Tektronix 4014 emulator displays the following status indicators:

On Line
When on, it indicates the emulator is on-line and ready to transmit or receive messages. When off, it indicates the emulator is off-line and does not communicate with the host device. It is set and cleared by selecting

Figure 5-5 **Tektronix 4014 status area**



[Enable/Disable On-Line] in the floating items auxiliary menu.

Local

Indicates the emulator is displaying local keyboard input, rather than waiting for the host to echo characters back to the screen. It is set and cleared by selecting [Enable/Disable Local Echo] in the floating items auxiliary menu.

Main text/graphics area

All your interaction with the host is conducted inside the main text/graphics area. The main text/graphics area is a rectangular array of pixels with its origin in the lower left corner. This rectangular array can be up to 1024 bits wide and 780 bits high, depending on the size of the emulator window. Host applications display a mixture of text and graphics in this area by first moving the "beam" to an arbitrary position and then sending the appropriate control sequences and data.

Text on the Tektronix 4014 does not scroll. If only text is sent (usually the case at the beginning of a session), it appears first in the upper left corner of the screen. Each subsequent line appears immediately below the previous one until the bottom line is filled. After this, lines appear at the center of the top line and on down the display. (If the host application fails to clear the

screen at the appropriate point, text overwrites itself, resulting in an illegible jumble. You can clear the display by pressing the <Page> function key, described in the next section of this chapter.)

The number of characters in a line and the number of lines on the display are determined by the current setting of the **Screen Width** parameter on the property or option sheet.

If you have made the emulator window smaller than its normal size, you can use the window scroll bars to bring any desired portion into view.

A crosshair cursor appears whenever the host application puts the terminal into Graphics Input Mode. You can position this cursor using either the cursor control keys, which function like the thumbwheels on a 4014, or the mouse.

Tektronix 4014 virtual keys

When you click the left mouse button within the emulation window, the emulation window becomes "active." The system software displays a set of virtual function keys at the bottom of your screen and remaps the workstation's keyboard to represent the keyboard and functions found normally at a Tektronix 4014 terminal.

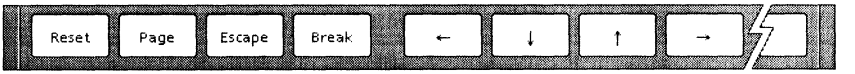
Besides the virtual function keys that are displayed automatically, you can display the keyboard's new meanings on the screen in a virtual keyboard window. This gives you full access to all ASCII control codes.

Tektronix 4014 emulation uses one virtual keyboard, the main TTY alphanumeric keyboard used by all asynchronous type terminals. Additionally, a Ten-Key Pad is available. These keyboards are described in the following sections.

Tektronix 4014 virtual function keys

The set of virtual function keys that first displays is shown in Figure 5-6 and explained below.

Figure 5-6 **Tektronix 4014 virtual function keys (6085 workstation)**



Note: Key labels and positioning are different for the 6085 and 8010 workstations.

The Tektronix 4014 virtual function keys include:

<Reset>
Sends the cursor back to its home position and resets the terminal to Alpha Mode. This key does not erase the current window.

<Page>
Resets the terminal to Alpha Mode, erases the screen, and disables the 4014's bypass condition.

<Esc>
Transmits an ASCII ESC character; equivalent to the Tektronix 4014 <Escape> key.

<Break>
Interrupts the computer; equivalent to the Tektronix 4014 <Break> key.

Arrow keys
Move the crosshairs in Graphics Input (GIN) Mode; equivalent to the Tektronix thumbwheels. These keys are useful when you need precisely vertical or horizontal crosshair movements, which are difficult to produce with the mouse.

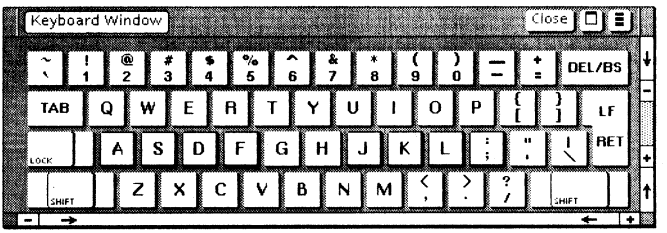
Tektronix 4014 Main keyboard

When the emulation window is active, you can display the Tektronix 4014 Main keyboard by simultaneously pressing the <KEYBOARD> key and the virtual function key corresponding to <Show>.

To use the Tektronix 4014 Main keyboard, press the real key corresponding to the position of the desired key in the virtual keyboard display.

Figure 5-7 illustrates the Tektronix 4014 Main keyboard for the 6085 workstation.

Figure 5-7 **Tektronix 4014 Main keyboard**



Note: For the 8010 workstation, the <Para-tab> key is equivalent to <Ctrl>. For the 6085 workstation, <KEYBOARD> (not shown) is equivalent to <Ctrl>.

You can hold down the <Ctrl> virtual key while pressing one or more keys to enforce the control state in the same manner as on the actual Tektronix 4014 terminal.

Select anywhere outside the emulation window to return the keyboard to its original meanings.

Note: While the emulation window is active, you can change the meaning of the keyboard to an inappropriate setting by pressing <KEY-BOARD> and selecting a different setting. For example, you can select the ViewPoint Office

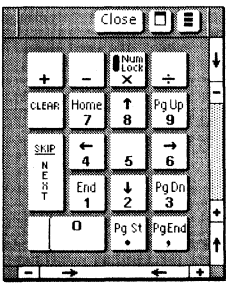
keyboard setting while the emulation window is active. However, when you type inside the window, characters without equivalents in the Tektronix 4014 character set appear as question marks.

Ten-Key Pad

On the 6085 workstation, when you display the Tektronix 4014 Main keyboard, the Ten-Key Pad window displays beside it. On the 8010 workstation, when you display the Tektronix 4014 Main keyboard, two key pad windows display beside it: the regular 8010 key pad and the Ten-Key Pad.

Figure 5-8 illustrates the Tektronix 4014 Ten-Key Pad window.

Figure 5-8 **Tektronix 4014 Ten-Key Pad**



To display the Ten-Key Pad window:

1. Select inside the emulation window.
2. Hold down the <KEYBOARD> key.
3. Press the function key corresponding to <Show>.
4. Release both keys.

A visual representation of the Ten-Key Pad appears next to the Tektronix 4014 Main keyboard.

On a 6085 workstation, either you can use the physical key pad on the keyboard or you can select within the Ten-Key Pad window with the mouse to enter characters shown in the Ten-Key Pad window.

On an 8010 workstation, select within the Ten-Key Pad window with the mouse.

Control of the cursor

In Alpha Mode, the Tektronix 4014 emulator cursor appears as an underscore. The position of the cursor is controlled by the host computer and represents the location at which alphanumeric text will appear.

In GIN Mode, you can use the mouse or the cursor keys to position the crosshair cursor. A subsequent keystroke sends the corresponding character and the current crosshair coordinates to the host computer.

You can enter information at the cursor location only when the Tektronix 4014 window is active. "Active," in this sense, means that the current type-in point is inside the emulation window. The characters you type appear in the window.

To make the window active, move the mouse inside it and click the left mouse button.

When the emulation window is not active, the host computer can still send data to display in the emulation window. When the host computer sends data to the workstation, it sets the emulator cursor independently of the workstation's current type-in point. Thus, you can continue to work in another window despite activity within the emulation window. However,

for you to enter information in the window, you must reactivate the window by clicking the left mouse button inside it.

In Alpha Mode, when the window is active, the cursor is black. When the window is not active, the cursor is gray.

Transferring information

During a session, you transfer information to and from the host. You can also use workstation Tektronix 4014 emulation to transfer information to and from another workstation. This section describes copying and moving text from your desktop to the emulation window, as well as exchanging data with another workstation. It then describes the [Make Screen] command that you use to capture information from the host.

Copying and moving text to the host

The emulator allows you to transfer text from desktop documents to a host computer:

1. Select the desired text that is to be transferred.
2. Press <COPY> or <MOVE>, as appropriate.
3. Select the destination inside the Tektronix 4014 window. The cursor marks the location at which the next character will be inserted.

When you move or copy information into a window, the following changes take place:

- Character properties are ignored.
- Characters or symbols without emulation equivalents appear as question marks.

- New line and new paragraph characters are converted to standard carriage returns.

The amount of text that can be copied or moved into a window varies between host systems.

CAUTION: If the host computer does not support flow control (or if the host supports it, but it is not properly selected on the TTY-Port property sheet), a copy or move operation may result in data lost at the host. A move operation also deletes the source text at the workstation: Thus, data can be permanently lost.

Terminal-to-terminal communication using workstation Tektronix 4014 emulation

When you use workstation Tektronix 4014 emulation (with Local RS232C Communication Access), you can exchange data with another user at a TTY-type terminal or terminal emulator. In this type of a session, neither end acts as the host: The terminal users at each end can send data to be displayed in the other user's emulation window.

To receive incoming calls from another terminal:

1. You and the sender first must agree on parameter settings for the workstation local port, such as **Line Speed** and **Character Length**.

2. Copy a workstation local port with the agreed upon settings onto the Tektronix 4014 Emulator icon.

3. Open the Tektronix 4014 Emulator icon.

4. The sender dials the number of the phone that is connected via modem to your workstation, thus connecting to your emulator.

5. Switch the modem to Data. The information from the sender is transferred into the

emulation window. You can then use [Make Document] or [Make Screen] to place the information in a document.

You can also connect two neighboring workstations by attaching a null modem cable to their RS232C ports.

Make Screen: Transferring a Tektronix 4014 screen to document form

When you select [Make Screen], a single screen of information is transferred from the emulation window into a document. [Make Screen] is a background activity.

To use [Make Screen], first make sure the *VP Document Editor* is running in your loader.

To transfer information from an emulation window, perform the necessary operations to display the desired information on the screen, and then select [Make Screen] in the window header. This information appears as a document icon with the Tektronix 4014 icon's name and a time stamp. For example:

1200B-VAX of 4-MAR-88 11:46:52PST

The length of the icon name determines whether or not the time stamp will show. If the emulator name contains over 50 characters, the emulator icon name is truncated in the name of the resulting document. In that case, the document icon name contains the first 50 characters, an ellipsis (. . .), and a time stamp:

<name> . . . <time stamp>

The document contains a single anchored graphics frame, which in turn contains an embedded graphics frame. This makes it easy to transfer the image to some other document. The [Make Screen] command creates the graphics frame just large enough to contain the entire image displayed. Within the graphics frame are

the graphics objects (for example, lines, text, dots) that comprise the structure. You can edit these objects. (Complex graphics objects may not be entirely represented in the document; the number of objects is limited to less than 4000.)

You can select the job name under [Cancel] in the background menu to interrupt the [Make Screen] process; however, any information being transferred may be lost or incomplete. (To view or cancel background activities, select the background process indicator in the upper right corner of your ViewPoint screen.)

You can also use the [Capture Screen] command in the *VP Free-Hand Drawing* application to capture more complex images but with lower resolution. For details on using *VP Free-Hand Drawing*, see the *Graphics Reference* volume in this library.

Once you capture information using [Make Screen], you can manipulate the resulting document as you would any other document. This includes printing, filing, formatting, editing, and mailing.

6. VP Terminal Emulation of VT640

The *VP Terminal Emulation of VT640* enables your workstation to function as a Retro-Graphics VT640 terminal. Once your workstation establishes a connection with the host, you can use your keyboard to send commands and keystrokes to the host.

The VT640 emulator communicates through TTY ports. Before you use the emulator, you first configure both TTY-port and VT640 emulator software by specifying properties on their property sheets.

To understand and use this product, first read the chapter titled "TTY ports" in this volume. It tells you how to load and configure TTY-port software and how to conduct an emulation session using TTY ports.

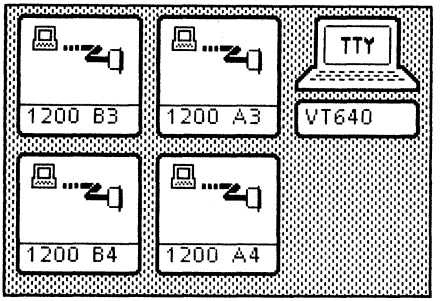
Key concepts of VT640 terminal emulation

To use the VT640 emulator, you retrieve and configure appropriate icons, begin a session with the host computer, and use emulation windows and virtual keyboards to communicate with the host.

Emulation icons

For VT640 emulation, you retrieve icons for both the TTY port and the emulator. Figure 6-1 shows the VT640 Terminal Emulator and TTY-Port icons as they might appear on your desktop.

Figure 6-1 **VT640 emulation icons**



You can perform the following actions on your emulation icons:

- You can associate a TTY port (or ports) with the terminal emulator by copying or moving the TTY-Port icon onto the emulator icon. The emulator icon then "contains" the port. (The emulator connects to the host through the ports it contains.)
- You can define certain characteristics of the terminal emulator and the ports it contains by specifying properties and options on the terminal emulator property and option sheets.
- You can define port characteristics by specifying properties on the TTY-Port property sheet. You can display and modify this sheet either by selecting the TTY-Port icon on your desktop or from within the terminal emulator property or option sheet.

Key concepts of a session

To begin a session with the host, you open the terminal emulator icon. The session either begins automatically or the terminal emulator option sheet appears, depending on whether or not you have selected [Display Options] on the emulator's property sheet.

If the option sheet displays, you can specify options for the session. You can also display the TTY-Port property sheet from the terminal emulator option sheet and select port properties for the session.

When you finish selecting options, select [Start]. The terminal emulator connects to the host and opens two emulation windows: a Transparent Mode window and a Graphics window. You use these windows to exchange information with the host.

After the session begins, you can use menu commands to further control the software.

During the session, the terminal emulation software translates your keystrokes into the key codes that the VT640 terminal would send to the host.

The VT640 terminal emulator provides the Personal Computing Resource (PCR) feature, which allows the workstation to send escape sequences not found on VT640 terminals. This feature also allows the emulator to exchange data with a VT100-compatible PC.

To end a session, you log off the host and close the emulation window.

You can find step-by-step instructions on conducting a session in the "TTY ports" chapter of this guide.

Constraints

The *VP Terminal Emulation of VT640* has the following limitations:

- Only the International Standards Organization (ISO) 646 7-bit code character set interchange is supported. (ASCII is a subset of this character set.)

- The emulator does not always display the current type-in point (such as the bottom line). You can always view the current type-in point by scrolling the window.

- Information within the emulation window cannot be directly copied or moved to another location, either within the emulation window or outside it. (You can use the [Make Screen] and [Make Document] commands, described later in this chapter, to capture information from the emulation window; then copy or move the captured information as you would from any ViewPoint document.)

The following Retro-Graphics VT640 functions are not supported by VT640 terminal emulation:

- Alignment test pattern
- Annotation of VT640 graphics by Transparent Mode text
- Block transfer
- Light Pen Mode
- Memory readback
- Status readback
- User-defined line types
- User Modes

The *VP Document Editor* limits the number of "graphics objects" (such as lines and points) in a frame to approximately 4000. If you make a document from a graphics display containing more than 4000 objects, the emulator copies as much as possible and then displays an error message.

VT640 Terminal Emulator icon

The VT640 Terminal Emulator icon behaves as both a functional icon and a ViewPoint container. This means, in part, that its property and option sheets provide two displays: (1) a set of properties or options that define the terminal emulator software and (2) a display of the TTY-Port icons that have been moved or copied into the terminal icon.

As a functional icon, the VT640 Terminal Emulator icon can be used to configure and run the software associated with it. When you select [Properties] on the property sheet or [Options] on the option sheet, the properties or options you use to configure the software are displayed.

The terminal icon as a container

When you select [Ports] at the top of either the VT640 Terminal Emulator property or option sheet, the contents of the "container" are displayed: a list of TTY ports. When you start the terminal emulation software, it interprets this list as the ports to try, in order, until it successfully reaches a host.

The terminal emulator Ports display looks and acts like an unsorted folder; however, only TTY-Port icons can be moved or copied into it. In addition, it functions somewhat differently when viewed through the option sheet rather than the property sheet. Functional differences are described later in this section.

Port order

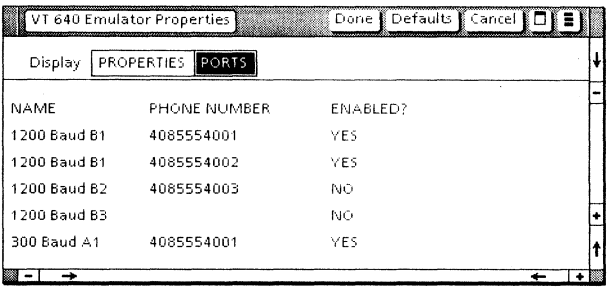
The order of ports within the terminal emulator icon is significant: It is the order in which the terminal emulator will try to use each port to make a connection. You can cause the terminal emulator to try the same port several times by

having multiple copies of that port within the terminal container. The emulation software will try each enabled port, in order, either until a connection through one is successful or until all ports have been unsuccessfully tried.

You can enable and disable the port by using the [Enable Port] and [Disable Port] commands in the window's auxiliary menu or the **Enabled** property on the port's property sheet.

Figure 6-2 shows an example of a terminal emulator icon property sheet displaying the ports contained in the icon. In this example, the terminal emulator will first attempt a connection through the port called 1200 Baud B1. It will then try the same port again to a different host phone number. Then, after skipping B2 and B3, the emulator will try the slower 300 Baud A1.

Figure 6-2 **VT640 properties sheet Ports display**



Terminal container property sheet operations

Any function that you can perform on port icons outside of the terminal property sheet Ports display you can also perform within it, such as <PROP'S>, <COPY>, and <MOVE>. All changes made to the Ports display, when shown through the terminal "container" property sheet, are remembered the next time you display the

terminal property sheet or open the terminal icon to establish a session.

If you select the [Cancel] command in the property sheet window header, none of the changes you made in the container are kept. This means that a port you have moved into the container will be lost. If you use the <MOVE> key to place a port within the container and then select [Cancel], the emulation software asks you to confirm the [Cancel] operation.

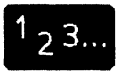
Terminal container option sheet operations

Changes you make to the contents of the terminal option sheet are in effect only for the current emulation session. For terminal properties and ports to be permanent, they must be changed through the property sheet. Not all container operations can be done through the option sheet, as it is meant only to affect the current session. Table 6-1 describes the behavior of different container operations performed within the terminal icon option sheet.

Table 6-1 **Operations within the option sheet container window**

Operation	Allowed?	Behavior
Copy a port into the container	yes	Port shows up on the display, and is used when attempting connection, but does not reappear when the container is reopened.
Move a port into the container	no	—
Copy a port out of the container	yes	A copy of the port is placed where indicated outside the container.
Move a port out of the container	no	—
Delete a port from within the container	no	—
Move a port to a different position within the container	yes	Port moves within the folder, and its new position is used when attempting connection; port returns to its original position when the container is reopened.
Copy a port already in the container, placing the copy elsewhere in the container	yes	A copy of the port is placed where indicated in the container, but does not reappear when the container is reopened.
<PROP'S> on a port within the container	yes	Any changed TTY-port options will affect the current session, but will return to their previous values once the container is closed.
[Enable/Disable Port]	yes	Will change the **Enabled** option of the TTY-port as requested, but the option returns to its previous value once the container is closed.

Retrieving the VT640 Terminal Emulator icon



To use the VT640 terminal emulation software, you first must run *Asynchronous Terminal Basic Software* in the Application Loader. Then load and run *VP Terminal Emulation of VT640*.

After running the software, retrieve a copy of the terminal icon to your desktop. To retrieve an icon:

1. Open the Workstation divider in the directory.
2. Open the Terminal Emulators divider, which contains an icon for each VP terminal emulator running in your loader.
3. Copy the VT640 Emulator icon to your desktop.

You can copy multiple icons to your desktop. You can then configure each one to represent different terminal characteristics (such as line length), a connection to a different port (or set of ports), or a connection to a different host computer. You do this by copying or moving TTY-Port icons into the terminal emulator icon.

After you configure terminal emulation properties for the terminal icon and the ports it contains, you will use the icon to start a session with the host.

VT640 Terminal Emulator property and option sheets

VT640 Terminal Emulator property and option sheets define the functional characteristics of your terminal emulation windows.

The VT640 Terminal Emulator option sheet is the same as the property sheet with these exceptions:

1. The **Icon Name** field displays in read-only format.

2. The **When Opening** property does not appear.

3. The [Start] command appears at the top of the option sheet window instead of the [Done] command.

All terminal emulator properties selected on the property sheet are retained until changed or until the icon is deleted.

Figure 6-3 shows an example of a VT640 Terminal Emulator property sheet. You can refer to it as you read the following property descriptions.

Icon Name

Allows you to uniquely name each terminal emulator icon. The name can be from 1 to 100 characters long. The first few characters will appear on the face of the icon on the desktop.

When Opening

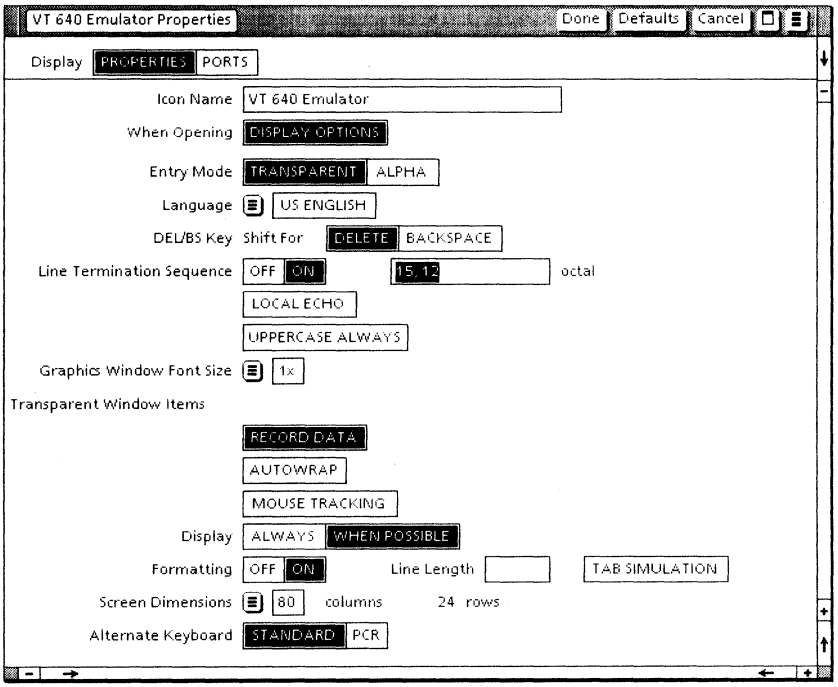
Determines whether or not the option sheet displays when you open the terminal emulator icon. If you select [Display Options], the option sheet displays when you open the icon.

If you do not select [Display Options], the option sheet does not display, and the settings from the property sheet apply to the session.

Entry Mode

Determines which window, the Transparent Mode window or the Graphics window (in Alpha Mode), will have the input focus when the emulator windows open.

Figure 6-3 **VT640 Emulator properties sheet**



Language

The standard VT640 terminal provides the full ASCII character set (94 printing characters), which is restricted to US English. The Language property should always be set to [US English].

If a different language is chosen, character codes are translated to and from the corresponding ViewPoint characters by translation tables in the data file TTYTranslations. As VT640 emulation does not actually support languages other than US English, this can yield unexpected results.

DEL/BS Key

Determines how the backspace key and the shift-backspace key will be represented. If

you select [Delete], then <Shift> <Backspace> becomes the equivalent of the delete key, and <Backspace> becomes the equivalent of the backspace key. If you select [Backspace], this is reversed.

Line Termination Sequence

Specifies what character (or characters) replaces a carriage return (CR) just before it is sent to the host. When this property is [Off], the carriage return is sent unchanged. When this property is [On], the carriage return is replaced by the line termination sequence (LTS).

The LTS is inserted whenever a line break occurs in the VT640 window. This happens at the following times:

- When you copy text from a document, the LTS is inserted each time the current line is full or a new paragraph character is encountered.
- When you type a carriage return at the keyboard.

You can specify from one to eight octal characters, separated by spaces or commas, for the LTS. The legal octal values range from 0 to 377. The legal characters are the digits 0 through 7, a space, and a comma. If you enter an illegal value or character, you will not be able to close the property sheet until you correct the error.

These octal numbers represent any byte from the standard ISO 646 7-bit character set. Valid separator characters are spaces (" ") or commas (",") in any combination. A comma is legal after a number or space. For example, the following are valid sequences:

- 15,012,23 (=carriage return-linefeed-DC3)

- 015, 12 (=carriage return-linefeed)
- 23, 015,12 (=DC3-carriage return-linefeed, with any number of spaces)
- 23 (=DC3)
- 0 00 1 2 377 10 023 (=0,0,0,1,2,377,10,23)
- 015, 12, 23, 15 0 23 (combinations of blanks and commas=15,12,23,15,0,23)

The LTS is defined by the host computer to which the emulator connects. Therefore, you must enter an LTS that is legal for the host computer.

Local Echo

Specifies whether the emulator echoes (displays) the characters typed in or waits for the host to echo the characters. **Local Echo** [On] means that the emulator itself displays each character before sending it to the host and does not expect the host to echo it back.

If two characters appear on the screen, it indicates that both the emulator and the host are echoing the character. In this case, local echo should be turned off at the workstation.

Upper Case Always

Causes all lowercase alphabetic characters (a-z) to be translated to their uppercase counterparts (A-Z) before they are sent to the host. This applies to all ViewPoint characters that have an uppercase equivalent. When no uppercase equivalent exists, the lowercase character is used. This mapping applies to characters entered into the VT640 window from both the keyboard and from move or copy operations.

Graphics Window Font Size

Allows you to select the font size for Alpha Mode in the Graphics window. The font

sizes available on the VT640 are 1x, 2x, 3x, and 4x.

When you select a font size, the corresponding numbers of characters-per-line and lines-per-screen change, and the font used by the [Make Screen] feature also changes. Table 6-2 summarizes the relationship between the font size and these other variables.

Table 6-2 **Graphics window font sizes**

Char. size multiplier	Char.-per-line	Lines-per-screen	[Make Screen] font
1x	80	34	Modern 10
2x	40	17	Modern 18
3x	26	11	Modern 30
4x	20	8	Modern 36

The following properties only affect the Transparent Mode window:

Record Data

This choice is available as an auxiliary menu command in the Transparent Mode window, as well as on the property and option sheets; so you can turn it on and off as many times as desired during a session. While this property is set, the contents of the session are saved for the [Make Document] command. While this property is not set, the contents of the session are not saved. For details, see the section titled "[Make Document]: Transferring VT640 information to document form" later in this chapter.

Autowrap

Causes the VT640 to automatically insert a

carriage return-linefeed combination at the end of a line.

Mouse Tracking
Enables you to use the mouse to select anywhere in the Transparent Mode window and have the proper cursor positioning escape sequences sent to the host. These sequences instruct the host to position the cursor at the current mouse position. You can select mouse tracking by using an auxiliary menu command in the Transparent Mode window, as well as by using this parameter on the property or option sheet.

Display
Allows you to specify whether text is displayed immediately when it is sent to the display ([Always]), or whether text is accumulated and displayed as part of a background process ([When Possible]). This choice is available as an auxiliary menu command in the Transparent Mode window, as well as on the property and option sheets.

Formatting
Allows you to specify that the terminal emulator will perform formatting operations to simulate much of the ViewPoint document format of the source text. It performs this formatting during move or copy operations into the Transparent Mode window. It will also automatically insert an LTS at the end of each transmitted line.

Note: For **Formatting** to work correctly, the LTS must be set to 15,12.

Line Length
If you select **Formatting** [On], the **Line Length** property displays. This property allows you to specify the maximum number of characters per line, not including the LTS, for text copied or moved into the emulation window.

The total line length is equal to the **Line Length** plus the LTS. The line length is independent of the **Screen Dimensions** property.

When this property is set and you copy or move text from a ViewPoint document, the emulator determines where a line break should occur. It keeps the line at or below the specified line limit and inserts an LTS at that point.

It is recommended that you prepare the source document in a fixed pitch font (for example, the Terminal 12 font). If you do this with margins and text equal to the **Line Length**, these line breaks should occur at approximately the same point in the destination text as in the source document.

This property will not affect the processing of text input from the keyboard.

The emulator does the following relative to various ViewPoint document conditions:

- If possible, lines are broken on a space, paragraph tab, normal tab, hyphen, or discretionary hyphen character. These are referred to as line-break characters. If the line has no line-break characters, it is broken at the line limit.

- When the break would occur immediately after the line limit, the line will be broken at the line limit. If the break occurred as a result of a space or tab, that character is discarded and the following character is placed in the first column of the next line.

- Paragraphs keyed without explicit new line characters are broken at the line-break character that appears closest to the line limit.

- If the source document has lines that are longer than the line limit setting, they are also broken at the line-break character that appears on or before the line limit. This will not be the same line breaking point seen in the open document.

Tab Simulation

If you select **Formatting** [On], the **Tab Simulation** property displays. This property determines whether or not the terminal emulator automatically converts tab characters to spaces for transmission to the host. When this property is set and you copy or move text into the emulation window, the emulator determines how many spaces to insert on the line so the next character properly aligns on the next tab stop, as determined by the source selection. If you have prepared the document in fixed pitch font, as recommended, the information formatted with tabs should appear much as it does in the displayed document.

When **Tab Simulation** is turned off and text is moved or copied from a ViewPoint document, both normal and paragraph tabs are converted to the ISO 646 horizontal tab (HT) character.

This property does not affect the processing of text input from the keyboard.

Screen Dimensions

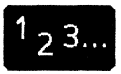
Allows you to select the screen width and to display the number of screen rows in read-only format. The screen width is the number of characters (or "columns") that will fit on one line in the window. You can specify either [80] or [132]. The number of screen rows is set at [24].

Alternate Keyboard

Selects which keyboard displays when you press the <Chg Kbd> virtual function key. If

[Standard] is selected, the VT640 Alternate keyboard displays. If [PCR] is selected, the Personal Computing Resource (PCR) Auxiliary keyboard displays.

Using the VT640 Terminal Emulator property and option sheets



You can use the VT640 Terminal Emulator property and option sheets to set properties and options both for the terminal emulator and for any TTY ports it contains. Settings on the property sheet are permanent: They remain from session to session. Settings on the option sheet are temporary: They remain for the duration of a session.

Setting TTY-port properties through the terminal emulator property and option sheets is described in the chapter titled "TTY ports."

This section describes setting terminal emulator properties and options.

Setting VT640 properties on the property sheet

To set properties on the VT640 Terminal Emulator property sheet:

1. Select the VT640 Terminal Emulator icon and press <PROP'S>.
2. Select the desired properties.
3. Select [Done] in the window menu to close the property sheet and store any changes made. Select [Cancel] to close the property sheet without storing changes.

Setting VT640 options on the option sheet

To set options on the VT640 Terminal Emulator option sheet, first check the property sheet to assure that the **When Opening** property is set to [Display Options].

1. Select the VT640 Terminal Emulator icon and press <OPEN>.
2. Select the desired options.
3. Select [Start] in the window menu to begin a session using the options you have selected. Select [Cancel] to close the emulator icon without starting a session.

The options you select will only affect the current session. The next time you display the option sheet, it will show the same settings as the property sheet.

VT640 windows

When an emulation session begins, the VT640 Terminal Emulator icon opens into two windows: a Transparent Mode window and a Graphics window. Only one of these windows is active at any time, depending on the mode of the terminal emulator. When a session begins, the active window (specified by the **Entry Mode** property on the property sheet) is on top.

The host changes the mode of the terminal emulator in response to instructions from the application it is running or in response to control sequences from the terminal.

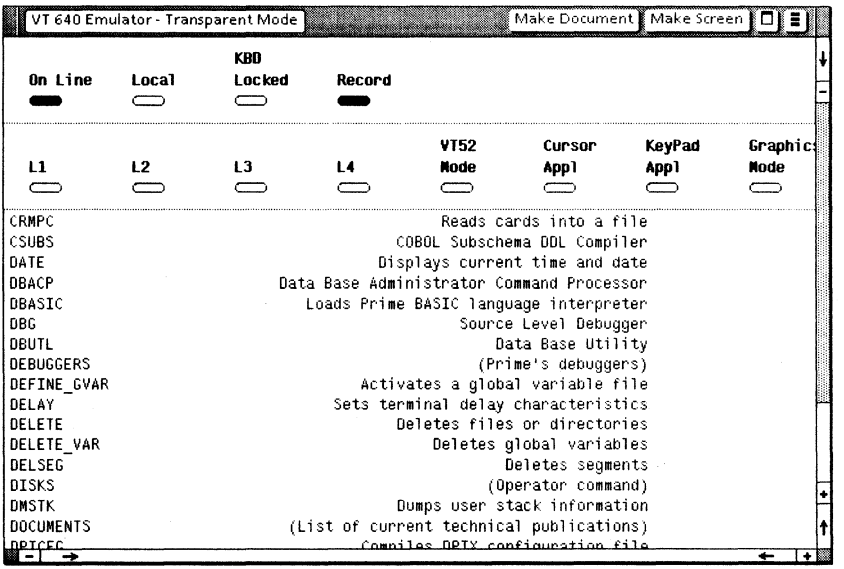
You can move and size the emulation windows separately. However, when you select [Close] at the top of the Graphics window, both windows close.

the top of the Graphics window, both windows close.

Transparent Mode window

The Transparent Mode window emulates VT640 Transparent Mode. (The original VT640 Transparent Mode emulates a DEC VT100.) This window displays data that travels to and from the host computer. It is divided into two areas: a status area and a main text area. Figure 6-4 shows a Transparent Mode window with a session in progress.

Figure 6-4 **VT640 Transparent Mode window**



Transparent Mode window commands

In the gray bar at the top of the window are commands you can use to regulate the emulation session. Commands available on the VT640 Transparent Mode window are described below:

[Make Document]
Creates a document containing all information appearing in the current screen plus all the information that has been scrolled off the screen since the last time [Make Document] was selected, provided that the [Record Data] command is also selected. The [Make Document] command is described in more detail in the "Transferring information" section later in this chapter.

[Make Screen]
Captures the information currently displayed on the screen and copies it into a document. The [Make Screen] command is described in more detail in the "Transferring information" section later in this chapter.

The following commands are found in the floating items auxiliary menu:

[Enable/Disable Online]
Controls whether or not the information you type in the emulation window is conveyed to the host. This command also displays on the Graphics window auxiliary menu.

This command does not affect your connection to the host. Your workstation remains connected and continues to receive and process data from the host whether or not this command is enabled.

The Online light indicator in the status area indicates if this command is enabled. If the light is lit, the information you type in the emulation window is sent to the host; if the

light is not lit, the information you type in the emulation window is not sent to the host.

[Enable/Disable Local Echo]
Controls whether the emulator *echoes* (displays) the characters you type or waits for the host to echo the characters. This command also displays on the Graphics window auxiliary menu. If the Local Echo light indicator in the status area is lit, local echo is enabled, and the emulator echoes the characters you type. If the host echoes characters, local echo should be disabled.

[Reset Modes]
Sets the following VT640 modes to their off state: VT52, Cursor Appl, Keypad Appl, and Graphics Mode.

[Enable/Disable Autowrap]
Controls whether the VT640 automatically places a carriage return-linefeed combination at the end of a line. If autowrap is not enabled and the last character position is reached on a line, the next character you type is displayed on top of the previous character.

[Enable/Disable Mouse Tracking]
Controls whether the terminal emulator sends cursor-positioning escape sequences to the host to reposition the cursor to a point selected by the mouse. If mouse tracking is enabled, you can select anywhere in the Transparent Mode window to change the current cursor position. If mouse tracking is disabled, you can select anywhere in the window to make the window active; then use the VT640 cursor keys to control the cursor.

[Record/Don't Record Data]
Determines whether data is recorded to a "backing document" for use by the [Make Document] command. Data is recorded as it is scrolled off the display. This command can be turned on and off at any time, and lets you stop recording data that does not need

to be saved. Performance increases slightly when [Don't Record Data] is selected, because data is not being copied to the backing document. When [Record Data] is selected, data is placed in the backing document as it is scrolled out of the Transparent Mode window.

Note: To improve performance, deselect [Record Data] in the Transparent Mode window auxiliary menu if [Make Document] will not be selected in the current session.

[Display Always/Display When Possible]
Controls whether text displays immediately when sent to the emulation window or whether it accumulates as part of a background process and is displayed when possible. If data from the host does not appear on your screen, select [Display Always].

[Enable/Disable PCR Option]
Controls which keyboard displays when you press the <Chg Kbd> virtual function key. If you enable the PCR option, the Personal Computing Resource (PCR) auxiliary keyboard displays. If you disable the PCR option, the standard VT640 Alternate keyboard displays.

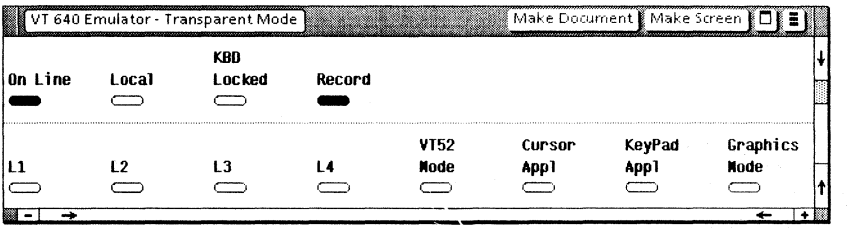
[Show Setup Sheet]
Displays the VT640 Set-Up properties sheet.

Transparent Mode status area

Status area symbols provide visual feedback from the host. Information in the status area is displayed in a read-only format. During emulation, "light" indicators appear in the VT640 status areas. A filled-in oval indicates that the light is on.

Appendix F, titled "TTY status indicators," describes the status indicators that appear for most TTY-type emulators. The VT640 Transparent Mode window displays the following additional status indicators (Refer to Figure 6-5, which shows the Transparent Mode window status area.):

Figure 6-5 **VT640 Transparent Mode window status area**



L1 through L4
Application programmable function "lights" are turned on and off by the host computer.

VT52 Mode
When on, it indicates that the emulator is operating in VT52 compatibility mode. When off, it indicates that the emulator is operating as a VT640.

Cursor Appl
When on, it indicates that the VT640 emulator is in cursor key mode.

KeyPad Appl
When on, it indicates that the VT640 emulator is in keypad application mode.

Graphics Mode
When on, it indicates that the VT640 emulator is using ISO character translations defined by the graphics code set. When off, it indicates the emulator is using ISO character

translations defined by the **Language** property on the property sheet.

Transparent Mode main text area

All your Transparent Mode interaction with the host is conducted inside the main text area of the Transparent Mode window. This area can contain up to 24 lines, each with the length set by the **Screen Dimensions** property in the property sheet.

You enter text to this area directly from your keyboard or by copying or moving it from a document.

The terminal emulator places incoming characters at the cursor position. When you press the carriage return or as it receives information from the host, the terminal emulator scrolls up the contents of the window one line at a time.

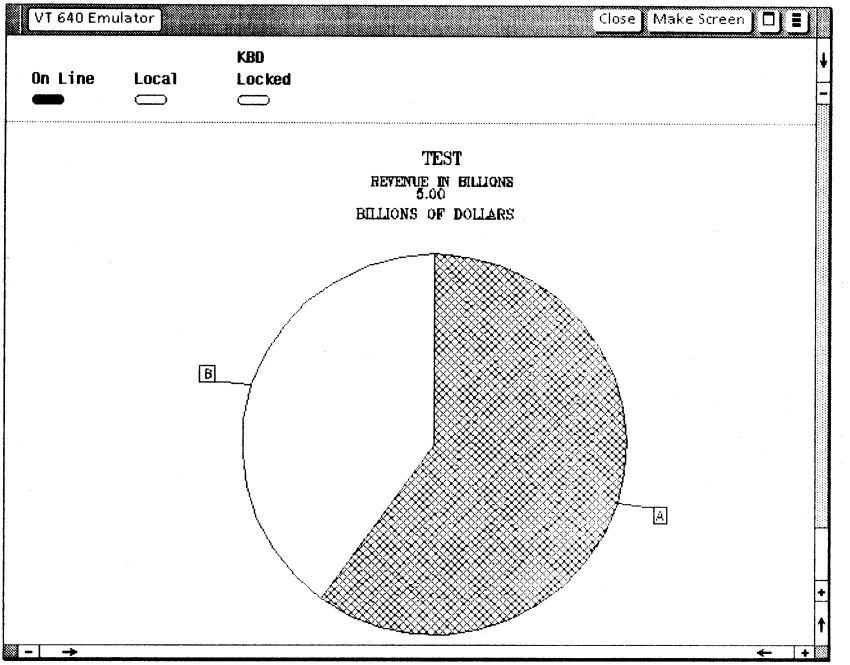
Not all 24 lines may be visible if the window is smaller than its standard size. The emulator does not always display the bottom line. Thus, if you are typing at the bottom of the text area, you may not see the line you are currently typing (or the host's response). However, you can always display it by using the window scroll bars or adjusting the size of the window.

Graphics window

The Graphics window emulates VT640 Graphics Mode. (The actual VT640 Graphics Mode emulates a Tektronix 4014 terminal.) This window always opens in Alpha Mode and can be changed to Graphics Input (GIN) Mode (also called "Crosshair Mode") by a control sequence or by the host application.

The Graphics window is divided into two areas: a status area and a main text-and-graphics area. Figure 6-6 shows a Graphics window with a session in progress.

Figure 6-6 **VT640 Graphics window**



Graphics window menu commands

In the floating items auxiliary menu at the top of the window are commands you can use to regulate the emulation session. Commands available on the VT640 Graphics window include the following:

[Show Port Properties]
: Displays, in read-only format, the property sheet for the TTY port through which the connection was made.

[Enable/Disable Online]
This command is the same as for the Transparent Mode window, described above.

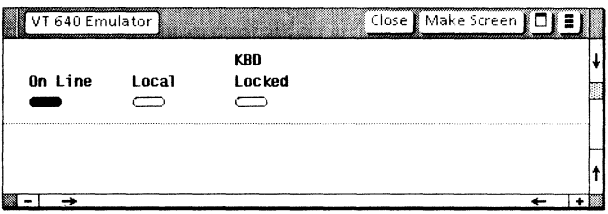
[Enable/Disable Local Echo]
This command is the same as for the Transparent Mode window, described above.

[Show Local Mode Menu]
This command displays the VT640 Local Mode menu. Using this command is the equivalent of pressing the VT640 keys <Set-Up Reset> followed by <PF3> on a real VT640 terminal. The Local Mode menu is described in the section titled "VT640 Local Mode menu" in this chapter.

Graphics window status area

Figure 6-7 shows the status indicators displayed in the Graphics window status area. These indicators are described in Appendix F, titled "TTY status indicators."

Figure 6-7 **VT640 Graphics window status area**



Graphics window main text/graphics area

All your interaction with VT640 graphics applications are conducted inside the main text/graphics area. The main text/graphics area is a rectangular array of pixels, 1024 bits wide and 780 bits high, with its origin in the lower left corner. Host applications display a mixture of text and graphics in this area by first moving the

"beam" to an arbitrary position and then sending the appropriate control sequences and data.

In Alpha Mode, only text is sent. This is usually the state of the terminal at the beginning of a session. The text appears first in the upper left corner of the screen. Each subsequent line appears immediately below the previous one until the bottom line is filled. After this, lines appear at the center of the top line and on down the display. (If the application fails to clear the screen at the appropriate point, text overwrites itself, resulting in an illegible jumble.)

In Alpha Mode, the number of characters in a line and the number of lines on the display are determined by the current setting of the **Graphics Window Font Size** property or option on the property or option sheet.

If you have made the emulator window smaller than its normal size, you can use the horizontal and vertical scroll bars to bring any desired portion into view.

A crosshair cursor appears whenever the host application puts the terminal into Crosshair Mode. You can position this cursor using either the cursor control keys or the mouse.

VT640 virtual keys

When either emulation window becomes active, the emulator software displays a set of virtual function keys at the bottom of your screen. These keys include <Break> and <Escape>. The emulator also remaps the workstation's keyboard to represent the keyboard and functions normally found at a VT640 terminal.

Besides the virtual function keys that are displayed automatically, you can display the keyboard's new meanings on the screen in a

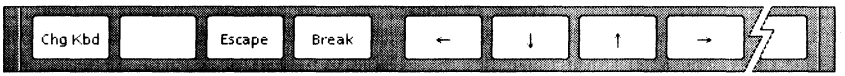
virtual keyboard window. This gives you full access to all ASCII control codes.

The VT640 Terminal Emulator provides two virtual keyboards: the VT640 Main TTY alphanumeric keyboard and an alternate keyboard. Additionally, a PCR auxiliary keyboard is available when the Personal Computing Resource (PCR) feature is used. These keyboards are described in the following sections.

VT640 virtual function keys

The set of virtual function keys that first displays is shown in Figure 6-8 and explained below.

Figure 6-8 **VT640 virtual function keys (6085 workstation)**



Note: Key labels and positioning are different for the 6085 and 8010 workstations.

The VT640 virtual function keys include:

<Chg Kbd>
Used to go between the main and alternate VT640 keyboards. If the key is pressed and released, the keyboard redefines to the alternate keyboard (or the main keyboard, if it was previously defined as the alternate keyboard).

This key can be held down while one or more keys are pressed, allowing quick access to the other keyboard. In this case, when you release the <Chg Kbd> key, the keyboard returns to its previous definition.

<Alt>
Used to interface with a VT100-compatible PC, if available.

<Escape>
Equivalent to the actual VT640 <Escape> key.

<Break>
Equivalent to the actual VT640 <Break> key.

Arrow keys
In the Transparent Mode window, these keys act as cursor control keys. In the Graphics window, when the terminal is in Crosshair Mode, these keys move the crosshairs.

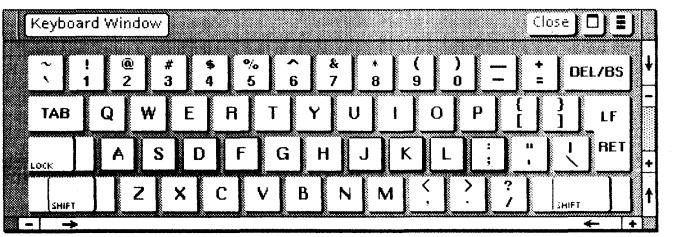
VT640 Main keyboard

When either emulation window is active, you can display the VT640 Main keyboard by simultaneously pressing the <KEYBOARD> key and the function key corresponding to <Show>.

To use the VT640 Main keyboard, press the real key corresponding to the position of the desired key in the virtual keyboard display.

Figure 6-9 illustrates the VT640 Main keyboard for the 6085 workstation.

Figure 6-9 **VT640 Main keyboard (6085 workstation)**



Note: For the 8010 workstation, the <Para-tab> key is equivalent to <Ctrl>. For the 6085

workstation, <KEYBOARD> (not shown) is equivalent to <Ctrl>.

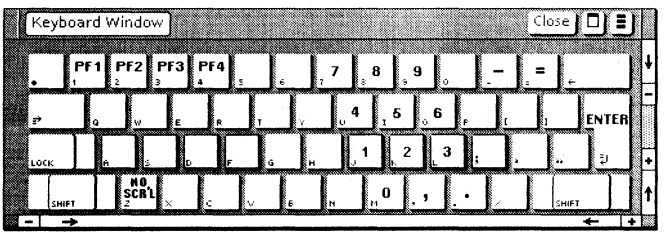
Select anywhere outside the emulation window to return the keyboard to its original meanings.

Note: While the emulation window is active, you can change the meaning of the keyboard to an inappropriate setting by pressing <KEYBOARD> and selecting a different setting. For example, you can select the ViewPoint Office keyboard setting while the emulation window is active. However, when you type inside the window, characters without equivalents in the VT640 character set appear as question marks.

VT640 Alternate keyboard

You can display the VT640 Alternate keyboard when either window is active. The VT640 Alternate keyboard contains the numeric keypad, four function keys, and several other keys that appear on a regular VT640 terminal but do not appear on the VT640 Main keyboard. These VT640 keys send escape sequences required by the host. Figure 6-10 illustrates the VT640 Alternate keyboard for the 6085 workstation.

Figure 6-10 **VT640 Alternate keyboard (6085 workstation)**



The VT640 PF keys function as follows:

<PF1>
Clears screen; Enters Alpha Mode.

<PF2>
Enters Transparent Mode.

<PF3>
Enters Local Mode; displays the VT640 Local Mode menu.

<PF4>
Initiates a dump to the graphics printer. This feature is not supported in this release.

Appendix C contains tables that describe the escape sequences sent by the VT640 Alternate keyboard.

To use the VT640 Alternate keyboard:

1. Select inside the active emulation window.
2. Press the <KEYBOARD> key and the virtual function key labeled <Show> for a visual representation of the keyboard.
3. Press the VT640 virtual function key labeled <Chg Kbd>. Pressing the <Chg Kbd> function key switches the virtual keyboard meanings from the VT640 Main keyboard to the VT640 Alternate keyboard.
4. Press the desired emulation key.
5. Press the <KEYBOARD> key and the function key corresponding to <Chg Kbd> again to return to the VT640 Main keyboard.

Note: While using the VT640 Main keyboard, you can press the function key corresponding to <Chg Kbd> to temporarily use the alternate keyboard for a few key strokes. Release <Chg Kbd> to return the keyboard to its initial state.

Refer to Appendix C for more information on the VT640 Alternate keyboard.

VT640 PCR Auxiliary keyboard

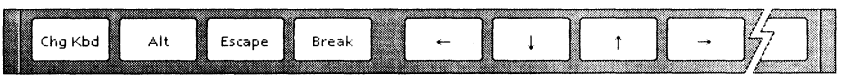
The PCR Auxiliary keyboard contains VT640 keys, IBM PC keys, and ten additional keys, labeled X1 through X10. The "X" keys send escape sequences that are not provided by the other keys. These escape sequences are shown in Appendix C.

You can use the PCR Auxiliary keyboard for two purposes:

- To exchange data with a VT100-compatible PC. In this type of session, the PC acts as the host computer.
- To communicate with applications or equipment requiring more keys than are present on the VT640 and PC

When the PCR feature is enabled, <Alt> appears on the second virtual function key (see Figure 6-11). The <Alt> virtual function key is the equivalent of the <Alt> key on the IBM PC keyboard.

Figure 6-11 **VT640 virtual function keys (PCR enabled)**



Enabling the PCR feature

You can enable the PCR feature in one of two ways:

- By selecting the [PCR] **Alternate Keyboard** on the VT640 Terminal Emulator property sheet

- By selecting [Enable PCR Option] on the Transparent Mode floating items auxiliary menu after a session is established

Using the PCR feature

To use the PCR Auxiliary keyboard:

1. Select inside the Transparent Mode window.
2. Holding down <KEYBOARD>, select the function key corresponding to <Show> for a visual representation of the keyboard.
3. Press the virtual function key labeled <Chg Kbd>.
4. Press the desired key.
5. Press the virtual function key labeled <Chg Kbd> to return to the VT640 Main keyboard.

Refer to Appendix C for information about the PCR Auxiliary keyboard and the escape sequences it sends.

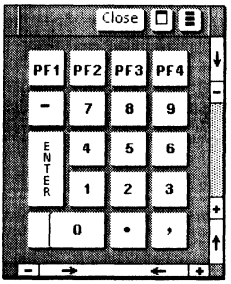
Ten-Key Pad

On the 6085 workstation, when you display the VT640 Main keyboard, the Ten-Key Pad window displays beside it. On the 8010 workstation, when you display the VT640 Main keyboard, two key pad windows display beside it: the regular 8010 key pad and the Ten-Key Pad.

The Ten-Key Pad has the same functions as the VT640 Alternate keyboard. Using this key pad eliminates the need to swap between the VT640 Main and the VT640 Alternate keyboards during an emulation session.

Figure 6-12 illustrates the VT640 Ten-Key Pad window.

Figure 6-12 **VT640 Ten-Key Pad**



To display the Ten-Key Pad:

1. Select inside the emulation window.
2. Hold down the <KEYBOARD> key.
3. Press the function key corresponding to <Show>.
4. Release both keys.

A visual representation of the Ten-Key Pad appears next to the VT640 Main keyboard.

On a 6085 workstation, either you can use the physical key pad on the keyboard or you can select within the Ten-Key Pad window with the mouse to enter characters shown in the Ten-Key Pad window.

On an 8010 workstation, select within the Ten-Key Pad window with the mouse.

Control of the cursor

In the Transparent Mode window, the VT640 cursor appears as an underscore, or optionally, as a hollow rectangle. The cursor marks the position where the next input character is

inserted. Its location is set by the host computer, the mouse cursor, or the cursor control keys.

Entering information

You can enter information at the cursor location only when the VT640 window is active. "Active," in this sense, means that the current type-in point is inside the emulation window: The characters you type appear in the window.

To make the window active, move the mouse inside it and click the left mouse button.

When the emulation window is not active, the host computer can still send data to display in the emulation window. When the host computer sends data to the workstation, it sets the emulator cursor independently of the workstation's current type-in point. Thus, you can continue to work in another window despite activity within the emulation window. However, for you to enter characters in the window, you must reactivate it by clicking the left mouse button inside the window.

When the window is active, the cursor is black. When the window is not active, the cursor is gray.

The mouse

You can use the mouse in the Graphics window in Crosshair Mode to position the crosshair cursor.

Using the mouse in the Graphics window while the terminal is in Transparent Mode, or vice versa, will have no effect.

Mouse tracking in Transparent Mode

If [Enable Mouse Tracking] is selected in the floating items auxiliary menu, you can use the mouse to set the emulator cursor to any

character location in the Transparent Mode window. You do this by pressing the left mouse button and moving the mouse to the desired location.

The emulator cursor changes to a temporary gray box as it tracks the mouse. This box is called the "mouse cursor."

When you release the left button, the VT640 cursor moves to the new position. This is similar to using the VT640 cursor control keys.

When you use mouse tracking, if you move the mouse outside the Transparent Mode window while pressing the left button, the emulator cursor remains in its original position. Any subsequent keystrokes are entered at the current selection within the window.

When [Disable Mouse Tracking] is selected in the floating items auxiliary menu, no random cursor movement is possible. Pressing a mouse button anywhere in the Transparent Mode window changes the selection to the window but does not affect the current cursor position.

When [Enable Mouse Tracking] is selected, if you want to select inside the emulation window without sending cursor-positioning escape sequences to the host, you must select the current cursor position.

Cursor control keys

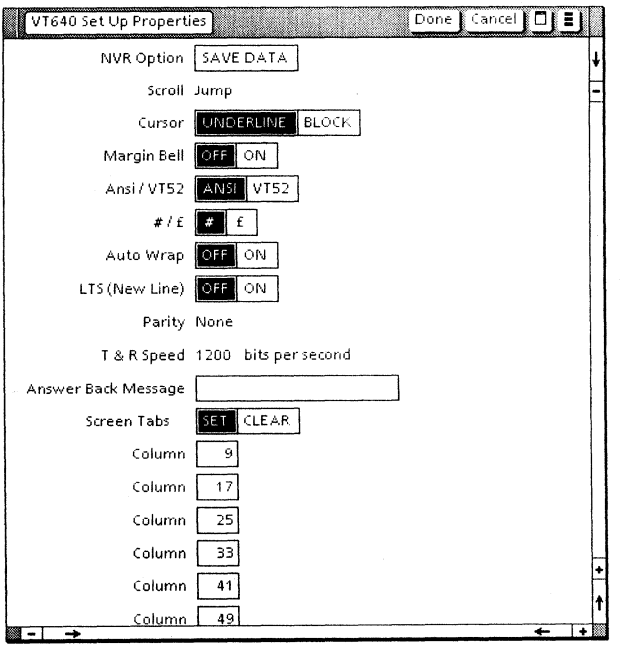
To use the cursor control keys to move the cursor, hold down the cursor control key labeled with the desired directional arrow: The cursor movement repeats until you release the key.

VT640 Set-Up properties sheet

You can select the VT640 Set-Up properties sheet from the Transparent Mode window to view certain terminal properties and to change others any time during an emulation session. The VT640 Set-Up properties sheet provides VT640 set-up properties and displays, in read-only format, properties that appear on the TTY-Port and VT640 Terminal Emulator property sheets. The set-up properties only affect the Transparent Mode window.

Figure 6-13 shows the VT640 Set-Up properties sheet.

Figure 6-13 **VT640 Set-Up properties sheet**



Set-up properties

VT640 set-up properties are explained below:

NVR Option
Nonvolatile memory (NVR) allows the set-up properties to be used for the current session or to be saved across sessions. Select [Save Data] to save the most often used settings. You can also make temporary changes in those properties for the current session. The **NVR Option** directly emulates the set-up save operation into NVR on the real VT640.

Note: If [Save Data] is selected, all information in the VT640 Set-Up property sheet is saved as part of the icon's permanent data.

Scroll
[Jump] is the only type of scrolling available for the Transparent Mode window. Upward scrolling places blank lines at the bottom of the scrolling region, line by line. Downward scrolling places blank lines at the top of the scrolling region, line by line. Lines scrolled off the screen can be placed in the [Make Document] file.

Cursor
Provides a choice of two cursors shapes, underline (_) or open block (□).

Margin Bell
Turns the margin bell on or off. The bell provides a warning sound when the cursor is eight characters from the end of the line.

ANSI/VT52
Switches the Transparent Mode window to an ANSI (American National Standards Institute) or a VT52 terminal.

 # /£
Determines what character appears when

<SHIFT> and <3> are pressed. Two settings are available: # and £.

Auto Wrap

Inserts a carriage return-linefeed combination when a line in the window becomes full. When **Auto Wrap** is selected and the last character position is reached, the next character received is automatically placed in the first character position of the next line.

Note: If this property is not selected and the last character position is reached, the next character typed in displays on top of the previous character (overwrites).

LTS (New Line)

This property is the same as the **Line Termination Sequence** (LTS) property on the icon's property sheet. It provides an alternative means for changing the setting of this feature during a session. When this feature is on, the LTS is sent to the host instead of carriage returns. This property replaces the VT640's new line set-up feature, replacing incoming linefeed characters with carriage return-linefeed when it is selected.

Parity

Provides the parity setting for the current session, in read-only format, based on the property set on the TTY-Port property sheet.

T & R (transmit and receive) **Speed**

Displays the line speed in read-only format. (The **Line Speed** property is set on the TTY-Port property sheet.)

Answer Back Message

Allows a message of up to 20 characters, including spaces and control characters, to be sent to the host computer when the host sends an ENQ signal.

Screen Tabs

This property allows you to view and change the location of tab stops for columns on a

line. You change tabs individually. You first delete the current setting; then type in the new value.

These tab settings are not to be confused with the tab settings obtained during a move or copy operation, in which tab stops are interpreted from the source selection.

Changing set-up properties during a session

To change properties during an emulation session:

1. Select [Show Setup Sheet] in the floating items auxiliary menu of the Transparent Mode window.
2. Select the desired properties.
3. Select [Save Data] if changes are to be retained; if [Save Data] is not selected, changes last only for the duration of the emulation session.
4. Select [Done] to close the property sheet and apply the selected properties, or select [Cancel] to close the property sheet without applying the changes.

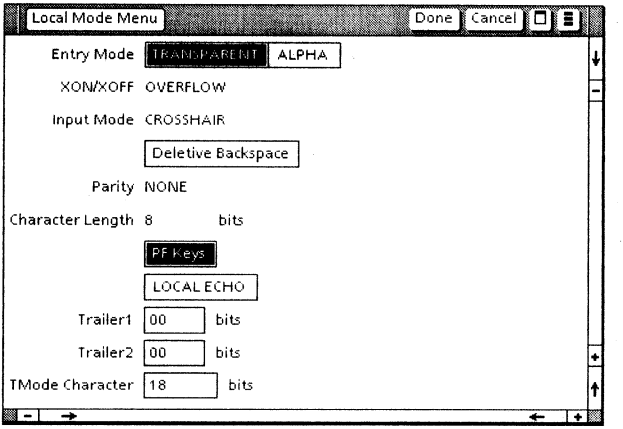
VT640 Local Mode menu

You can select the VT640 Local Mode menu from the Graphics window to view certain terminal options and to change others any time during an emulation session. These options only affect the Graphics window.

Contrary to normal ViewPoint conventions, but consistent with VT640 operation, items changed in the Local Mode menu are saved as permanent data and thus affect subsequent sessions with the same icon.

Figure 6-14 shows the VT640 Local Mode menu.

Figure 6-14 **VT640 Local Mode menu**



VT640 Local Mode menu options are explained below:

Entry Mode

Defines which mode, Transparent or Alpha, will be active when a session begins. If you select Transparent Mode, the emulator opens in Transparent Mode with the Transparent Mode window active and on top. If you select Alpha Mode, the emulator opens in Alpha Mode with the Graphics window active and on top.

XON/XOFF

Displays, in read-only format, the **XON/XOFF Method** selected on the VT640 Terminal Emulator option sheet.

Input Mode

Displays the [Crosshair] option in read-only format. Crosshair Mode is the only VT640 graphics input mode supported by the emulator. (The emulator does not support Light Pen Mode.)

Deletive Backspace
When this parameter is selected, the backspace key moves the cursor back one character and deletes the character; otherwise, the backspace key moves the cursor back one character without deleting the character.

Parity
Displays, in read-only format, the parity selected for the TTY port. Because parity is determined when a connection is first established, it is not selectable within a session.

Character Length
Displays, in read-only format, the number of bits that define a character. Because character length is determined when a connection is first established, it is not selectable within a session.

PF Keys
Enables or disables PF key functioning. VT640 PF key functions are described in the "VT640 Alternate keyboard" section of this chapter.

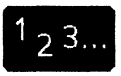
Local Echo
Controls whether or not the emulator echoes each character sent to the host computer. This option also displays on the floating items auxiliary menu of the Graphics window. If the Local Echo light indicator in the status area is lit, **Local Echo** is enabled, and the emulator echoes the characters you type. If the host echoes characters, this option should not be selected.

Trailer1, Trailer2
These hexadecimal characters correspond to the first two characters in the **Line Termination Sequence** on the VT640 property and option sheets.

TMode Character
The emulator switches to Transparent Mode

when the hexadecimal character specified here is received. The default value (CAN = 18 hexadecimal) matches that of the actual VT640 terminal.

Transferring information



During a session, you transfer information to and from the host. You can also use workstation VT640 emulation to transfer information to and from another workstation. This section describes copying and moving text from your desktop to the emulation window, as well as exchanging data with another workstation. It then describes the [Make Document] and [Make Screen] commands that you use to capture information from the host.

Copying and moving text to the host

The emulator allows you to transfer text from desktop documents to a host computer. The amount of text that can be copied or moved into a window varies between host systems. If the host computer does not support flow control (or if the host supports it but it is not properly selected on the TTY-Port property sheet), a copy or move operation may result in data lost at the host.

To transfer text:

1. Select the desired text that is to be transferred.
2. Press <COPY> or <MOVE> as appropriate.
3. Select the destination inside the active VT640 window. The cursor marks the location in which the next character will be inserted.

When you move or copy information into a VT640 window, the following changes take place:

- Character properties are ignored.
- Characters or symbols without emulation equivalents appear as question marks.
- New line and new paragraph characters are converted to standard carriage returns.

The amount of text that can be copied or moved into a window varies between host systems.

CAUTION: If the host computer does not support flow control (or if the host supports it but it is not properly selected on the TTY-Port property sheet), a copy or move operation may result in data lost at the host. A move operation also deletes the source text at the workstation: thus data can be permanently lost.

Copying and moving text to the Transparent Mode window

In Transparent Mode, if mouse tracking is disabled, text copied or moved into the window always appears at the cursor location. Cursor-control escape sequences are not sent to the host during a copy or move operation to a VT640 window.

If mouse tracking is enabled, the appropriate cursor-control escape sequences cause the cursor to move to the new selected location before the move or copy operation occurs.

When **Formatting** is selected in the property or option sheet, lines in the document are broken at space, paragraph, paragraph tab, normal tab, hyphen, or discretionary hyphen characters if at all possible. These are referred to as line-break characters. Line break conditions are described under **Line Length** in the section of this chapter called "Transparent Mode window options."

Terminal-to-terminal communication using workstation VT640 emulation

When you use workstation VT640 emulation (with Local RS232C Communication Access), you can exchange data with another user at a TTY-type terminal or terminal emulator. In this type of a session, neither end acts as the host: The terminal users at each end can send data to display in the other user's active emulation window.

To receive incoming calls from another terminal:

1. You and the sender first must agree on parameter settings for the workstation local port, such as **line Speed** and **Character Length**.

2. Copy a workstation local port with the agreed upon settings onto the VT640 Emulator icon.

3. Open the VT640 Emulator icon.

4. The sender dials the number of the phone that is connected via modem to your workstation, thus connecting to your emulator.

5. Switch the modem to Data. The information from the sender is transferred into the emulation window. You can then use [Make Document] or [Make Screen] to place the information in a document.

You can also connect two neighboring workstations by attaching a null modem cable to their RS232C ports.

Make Document: Transferring Transparent Mode data to document form

You can use [Make Document] in the Transparent Mode window. This feature is not supported in

the Graphics window, because no data scrolls off the screen in Graphics mode.

When you select [Make Document], information from the emulation window is transferred into a document. All information appearing on the current screen, plus all the information that has been scrolled off the screen since [Make Document] was last selected, is transferred.

Thus, if you use [Make Document], then scroll to another screenful of information, and repeat [Make Document], you will obtain two copies of the first screen: one at the end of the first document and another at the beginning of the second document. In the first document, the current screen is the last information captured; in the second document, the screen has become part of the information scrolled off the screen since [Make Document] was last invoked.

To use [Make Document], you must have the *VP Document Editor* running in your loader.

[Record Data] must be selected in the floating items auxiliary menu before [Make Document] can be selected. Any information scrolled off the screen before [Record Data] is selected is lost. Thus, you can use [Record Data] to limit the amount of data captured, turning it on before and off after the specific lines you want recorded.

To transfer information, select [Make Document] in the window header. The transferred information appears as an icon with a name and a time stamp. For example:

1200B-VAX of 4-MAR-88 11:46:52PST

The length of the icon name determines whether or not the time stamp will show. If the emulator name contains over 50 characters, the emulator icon name is truncated in the name of the resulting document. In that case, the document icon name contains the first 50 characters, an ellipsis (. . .), and a time stamp:

<name> . . . <time stamp>

Notes:

- Character properties, such as bold-facing or underlining, are not preserved when [Make Document] is selected.
- Pressing <STOP> interrupts the [Make Document] process; however, any information being transferred to the document may be lost or incomplete.

Make Screen: Transferring a VT640 screen to document form

You can use [Make Screen] in either the Transparent Mode or Graphics window. When you select [Make Screen], a single screen of information is transferred from the emulation window into a document.

To use [Make Screen], you must have the *VP Document Editor* running in your loader.

To transfer information from an emulation window, run the session until the desired information appears on the screen, and then select [Make Screen] in the window header. This information appears as a document icon with the VT640 icon's name and a time stamp. The rules for the formation of the document icon name are the same as for the [Make Document] icon described above.

In the Transparent Mode window

The [Make Screen] feature preserves character properties, such as bold-facing and underlining. However, it does not preserve double height, double width, or reverse video.

Pressing <STOP> interrupts the [Make Screen] process; however, any information being transferred may be lost or incomplete.

In the Graphics window

The [Make Screen] document contains a single anchored graphic frame, which in turn contains an embedded graphics frame. This makes it easy to transfer the image to some other document. The [Make Screen] command creates the graphics frame just large enough to contain the entire image displayed. Within the graphics frame are the graphics objects (for example, lines, text, dots) that comprise the structure. You can edit these objects. (Complex graphics objects may not be entirely represented in the document; the number of objects is limited to less than 4000.)

You can select the job name under [Cancel Current Activities] in the background menu to interrupt the [Make Screen] process; however, any information being transferred may be lost or incomplete. (To view or cancel background jobs, select the background process indicator in the upper right corner of your ViewPoint screen.)

You can also use the [Capture Screen] command in the *VP Free-Hand Drawing* application to capture more complex images but with lower resolution. For details about *VP Free-Hand Drawing*, see the *Graphics Reference* volume in this library.

Using captured information

Once you capture information using [Make Document] and [Make Screen], you can manipulate the resulting document as you would any other document. This includes printing, filing, formatting, editing, and mailing.

You can also use *VP Data Capture* to run Transparent Mode information through a program that formats it as a table. This feature allows you to transfer data easily into record files or bar charts. *VP Data Capture* is described in a separate part of this volume.

7. VP Terminal Emulation of IBM 3270

The *VP Terminal Emulation of IBM 3270* enables your workstation to function as a 3278-series terminal. This series of terminals includes the IBM 3278 Models 2, 3, 4, and 5. Once your workstation establishes a connection with the host, you can use your keyboard to send commands and keystrokes to the host.

A networked 6085 or 8010 workstation with the appropriate software installed can communicate with the host using either IBM BSC (Binary Synchronous Communications) or IBM SNA (System Network Architecture) communication protocols.

Key concepts of 3270 terminal emulation

The 3270 terminal emulator uses networked emulation. This means that the emulator sends data through the Ethernet to the External Communication Service (ECS), which performs protocol translation.

To use the 3270 emulator, you retrieve and configure its icon, begin a session with the host computer, and use an emulation window and virtual keyboards to communicate with the host.

Communication protocols

In a typical computer installation using IBM communication protocols, the host is attached to a 3705 communications controller (or host "front end"), which controls all communications between the host and remote devices. The 3705

manages one or more 3276-2 cluster controllers (for BSC communication) or 3276-12 cluster controllers (for SNA communication). Each cluster controller can control up to eight 3278-series terminals.

A 3278-series terminal sends data to the host computer, which transmits data back to the terminal as output. Each terminal is connected by cable to the cluster controller. This cable can be no longer than 2,000 feet. A high-speed, leased telecommunications line connects each cluster controller to the 3705 communications controller and thus to the host computer.

Figure 7-1 shows an example of a typical SNA network. A BSC installation is somewhat simpler, only allowing cluster controllers to access the host front-end directly or through telecommunications lines, but not through network nodes.

In the Xerox environment, the 3270 package emulates IBM communication in the following ways:

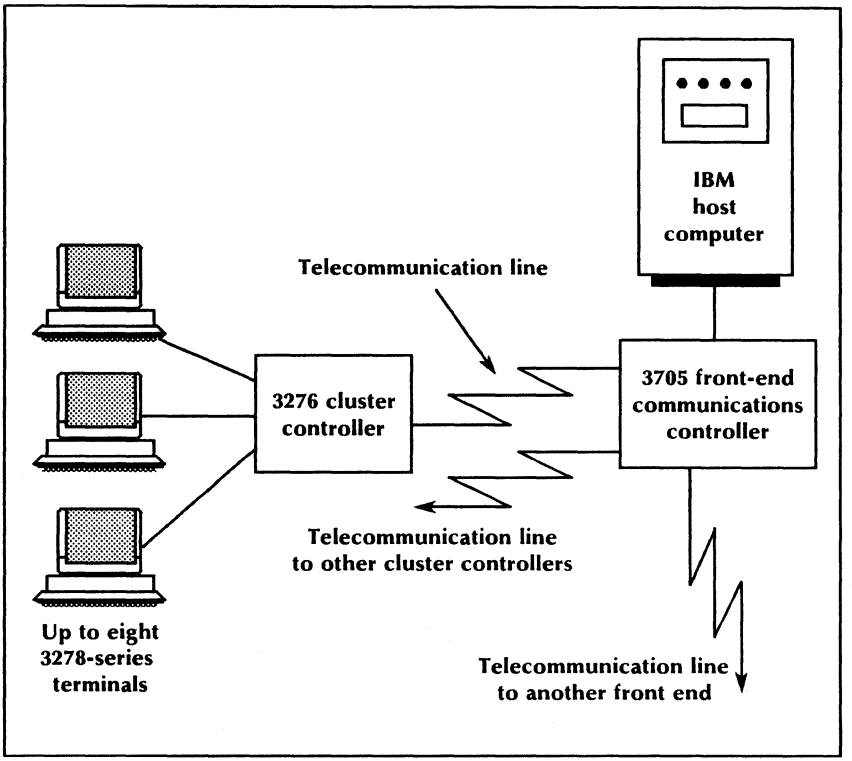
- A workstation running *VP Terminal Emulation of IBM 3270* emulates the IBM 3278-series terminal.

  The workstation can receive information from the host and accept the data you type in, much like a real 3278-series terminal. This information is then sent through the Ethernet to an ECS running 3270 Communication Protocol software with either BSC or SNA enabled.

  Note: 3278 Model 3, 4, and 5 emulations are supported only for the SNA communication option.

- The ECS acts as an interface that translates Xerox Network System (XNS) communication protocols into the communication protocols the IBM host understands: either BSC or SNA. In performing this function, the ECS

Figure 7-1 **Typical SNA network**

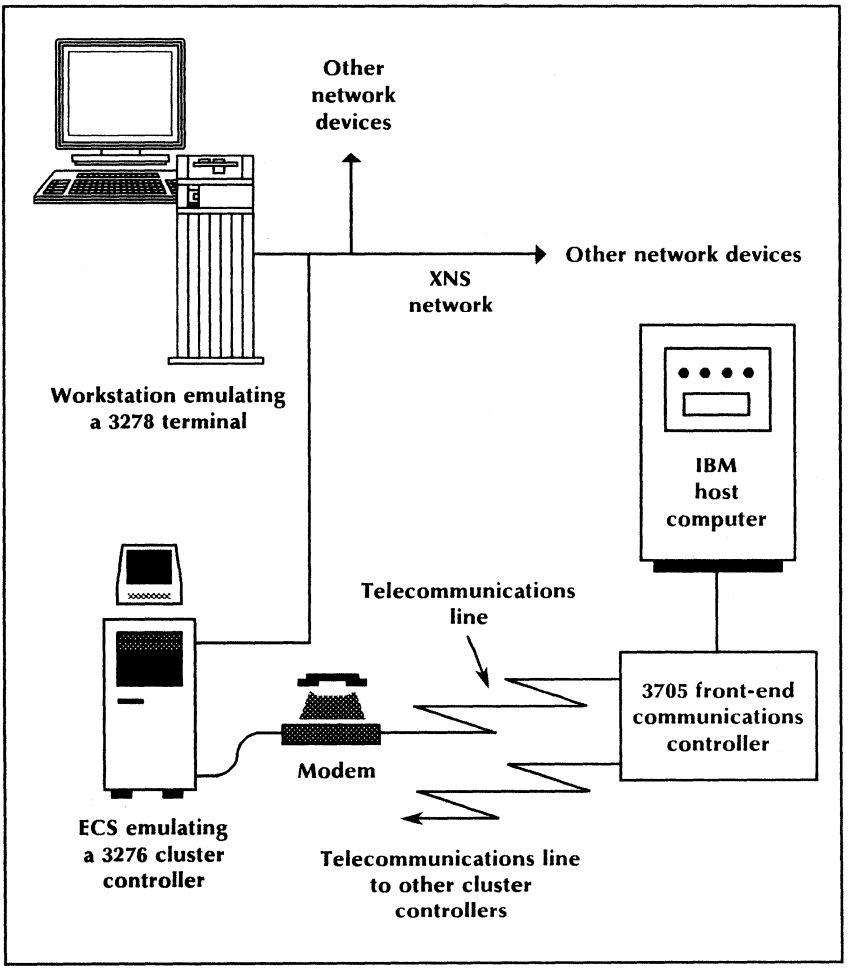


emulates either an IBM 3276-2 (for BSC) or an IBM 3276-12 (for SNA) cluster controller.

When the ECS receives data from the host, the 3270 Communication Protocol also converts information from IBM protocols to XNS protocols for transmission to the workstation.

Figure 7-2 shows the VP emulation of an SNA cluster controller with terminals, configured within an SNA network.

Figure 7-2 **3270 emulation in an SNA network**



Ports

The 3270 emulator communicates with a host through a port controlled by an ECS. The SNA protocol can use one of the following:

- An RS232C port on the ECS server (called an *ECS local port*).
- An RS232C port on a Communication Interface Unit (CIU) managed by the ECS (called a *CIU port*). The CIU is a device that provides the ECS with four to eight additional RS232C ports. For SNA, the CIU port must lead to a full-duplex, leased line.

The BSC protocol uses an ECS local port.

Your System Administrator configures these ports to conform to the requirements of the host computer.

Key concepts of a session

To begin a session with the host, you open the terminal emulator icon. The session either begins automatically or the terminal emulator option sheet appears, depending on whether or not you have selected **Display Options** on the emulator's property sheet.

If the option sheet displays, you can specify options for the session. When you finish selecting options, select [Start]. The terminal emulator connects to the host and opens an emulation window. You use this window to exchange information with the host.

After the session begins, you can use menu commands to further control the software.

During the session, the terminal emulation software translates your keystrokes into the key codes that the 3270 terminal would send to the host.

To end a session, you log off the host and close the emulation window.

You can find step-by-step instructions on conducting a session later in this chapter.

Software requirements

In addition to the emulation and system software listed in Chapter 1, 3270 emulation requires that the 3270 Communication Protocol is installed on the ECS.

Constraints

The *VP Terminal Emulation of 3270* has the following limitations:

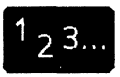
- The emulator does not always display the current type-in point (such as the bottom line). You can always view the current type-in point by scrolling the window.
- Magnetic strip reading devices, printers, and light pens are not supported.
- Partitioning of the window display area is not supported.
- Commands currently not supported by the *VP Terminal Emulation of IBM 3270* software include:
  - The Print command, which allows IBM 3270 output to be sent directly to a printer (such as the IBM 3284). To print information received in an emulation session, select [Make Screen].
  - Copy
  - Select (all Select commands)
  - Chained Read

- Test Request

- The BSC communication option supports only 3278 Model-2 terminal emulation; it does not support Models 3, 4, and 5.

- The optional light pen or joystick on a 3278-2 terminal is not supported by this software.

Retrieving the 3270 Terminal Emulator icon



To use the 3270 terminal emulation software, you first load and run it in the application loader and then retrieve a copy of its icon to your desktop. To retrieve an icon:

1. Open the Directory divider, the Network divider, the appropriate organization divider, and the appropriate domain divider.

2. Open the IBM 3270 Emulators divider. The number of 3270 icons available depends on the number of host computer entries registered in the Clearinghouse.

3. Copy the desired 3270 icon to your desktop. The pointer changes into a miniature emulator icon until you select a location on your desktop.

Note: The name of each icon is initially set by the System Administrator. You can rename the 3270 icon on the desktop using the property sheet.

You can copy multiple icons to your desktop, each representing a connection to a different host (or a different connection to the same host). After you configure terminal emulation properties, you will use the icon to start a session with the host.

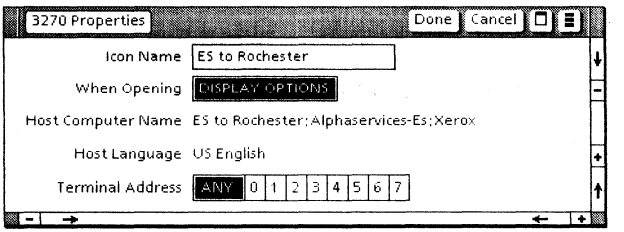
3270 Terminal Emulator property and option sheets

The 3270 Terminal Emulator option sheet is the same as the property sheet with these exceptions:

1. The **Icon Name** field displays in read-only format.
2. The **When Opening** property does not appear.
3. The [Start] command appears at the top of the option sheet window instead of the [Done] command.

Figure 7-3 shows an example of a 3270 Terminal Emulator property sheet. You can refer to it as you read the following property descriptions.

Figure 7-3 **3270 properties sheet**



Note: The 3270 Terminal Emulator property sheet displays additional properties when the 3270 File Transfer application is running in your application Loader. For explanations of these properties, see *VP IBM 3270 File Transfer* in this volume.

Icon Name

Allows you to uniquely name each terminal emulator icon. The name can be from 1 to 100 characters long. The first few characters will appear on the face of the icon on the desktop.

When Opening

Determines whether or not the option sheet displays when you open the terminal emulator icon. If you select [Display Options], the option sheet displays when you open the icon.

If you do not select [Display Options], the option sheet does not display, and the settings from the property sheet apply to the session.

Host Computer Name

Displays, in read-only format, the name of the IBM host the System Administrator enters in the Clearinghouse database.

Host Language

Displays the host language of the IBM system in read-only format. The System Administrator enters the appropriate choice when specifying the Clearinghouse entry for the IBM host. This property allows the 3270 window to properly translate character codes received from the IBM host and to properly interpret the 3270 keyboard keys to transmit the desired character codes.

Terminal Address

Allows you to assign an emulation session to a certain terminal address by selecting one from a list. If the choice is already in use, the connection is not made and an appropriate message is displayed. If the address is not important, select [Any]; the first available address will be assigned.

Using the 3270 Terminal Emulator property and option sheets

You can use the 3270 Terminal Emulator property and option sheets to set properties and options for the terminal emulator. Settings on the property sheet are permanent: They remain from session to session. Settings on the option sheet are temporary: They remain for the duration of a session.

Setting 3270 properties on the property sheet

To set properties on the 3270 Terminal Emulator property sheet:

1. Select the 3270 Terminal Emulator icon and press <PROP'S>.
2. Select the desired properties.
3. Select [Done] in the window menu to close the property sheet and store any changes made. Select [Cancel] to close the property sheet without storing changes.

Setting 3270 options on the option sheet

To set the terminal address on the 3270 Terminal Emulator option sheet, first check the property sheet to assure that the **When Opening** property is set to [Display Options].

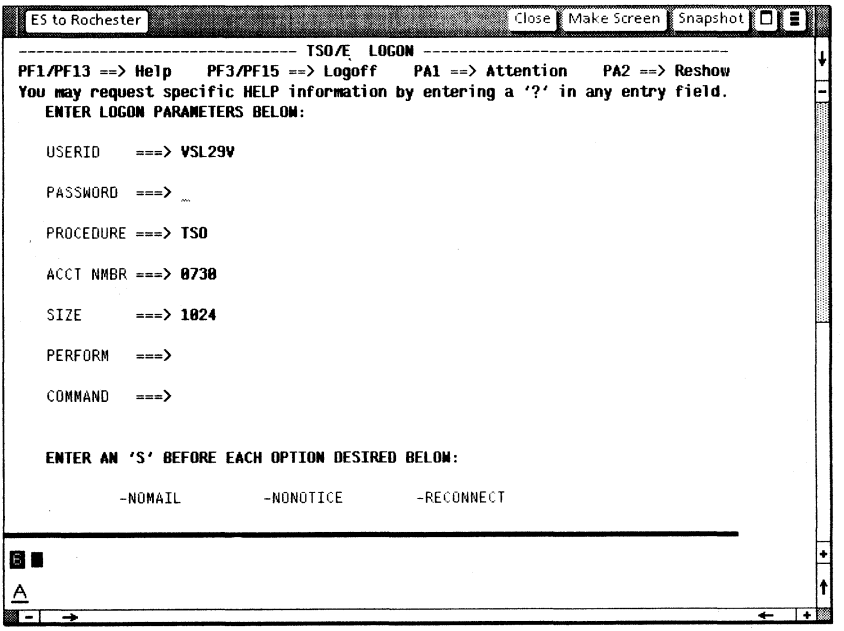
1. Select the 3270 Terminal Emulator icon and press <OPEN>.
2. Select the desired address.
3. Select [Start] in the window menu to begin a session using the address you have selected. Select [Cancel] to close the emulator icon without starting a session.

3270 window

When an emulation session begins, the 3270 Terminal Emulator icon expands into a 3270 window (or "emulation window").

The 3270 window displays the data that travels to and from the host computer. It is divided into two areas: a status area and a main text area. Figure 7-4 shows a 3270 window with a session in progress.

Figure 7-4 **3270 emulation window**



Menu commands

In the gray bar at the top of the window are commands you can use to regulate the emulation session. The [Make Screen], [Snapshot], and [Enable/Disable Beep] commands are unique to 3270 emulation. The [Make Screen] and [Snapshot] commands are described in the "Transferring information" section later in this chapter.

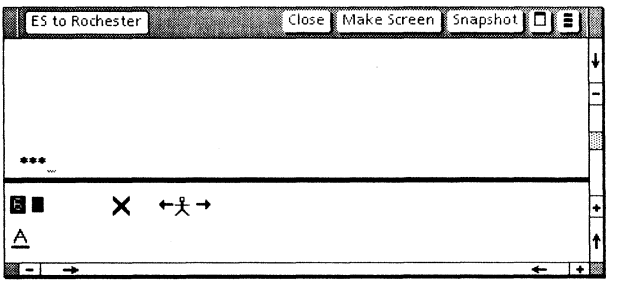
[Enable/Disable Beep]
Controls whether or not the workstation will beep when it receives a signal to do so from a 3270 host application.

Status area

Status area symbols provide visual feedback from the host. For the 3270 terminal emulator, the status area is at the bottom of the screen. Information in the status area is displayed in a read-only format.

Figure 7-5 shows an example of the status area of a 3270 window. The status indicators displayed in this area are identical to those used on a real 3278 terminal display. The example shows a 3270 terminal emulator using the SNA communication option.

Figure 7-5 **3270 window status area**



Main text area

You will use the main text area to interact with the forms and data from the host application. When you first open the window, the main text area is filled with blanks, and the cursor is in the upper left corner. The cursor moves automatically when you enter data or when data is displayed from the host.

To type in the window, first select inside the 3270 window. If a selection is made outside the 3270 window, the 3270 cursor shading changes from black to gray, indicating the selection is no longer in the 3270 window. The cursor can be repositioned by moving it with the mouse and clicking the left button.

BSC window size

The BSC communication option supports only 3278 Model-2 emulation, which is fixed with one window size, a 1920-character matrix with 24 rows and 80 columns.

SNA window size

For the SNA communication option, the window size varies. When an emulator window opens up in an SNA environment, the window dimensions are set to the default capacity of 1920 characters with a 24-row by 80-column format. At the start of an SNA logical unit (LU) session, the host computer sends presentation data to the terminal. This data contains default and alternate window dimensions as part of the "bind presentation data" for the LU session. When the the emulation software receives this data, it adjusts the emulation window accordingly.

The emulation software accepts presentation data for an IBM 3278 Models 2, 3, 4, or 5.

The window expands into the alternate window when an Erase/Write/Alternate command is received from the host computer. The window remains in the alternate size until one of the following occurs:

- You press <Clear> or <Sys Req>.
- An Erase/Write command is received from the host.

The window then switches to the default size. At the end of an LU session, the emulation window resets to the 24-by-80 default and alternate screen dimensions.

Table 7-1 shows the display formats supported for the default and alternate windows.

Table 7-1 **SNA window display formats**

Rows	Columns	
	80	**132**
12	Yes	Yes
24	Yes	Yes
27	Yes	Yes
32	Yes	No
43	Yes	No

3270 virtual keys

When you click the left mouse button within the emulation window, the emulation window becomes active. The system software displays a set of virtual function keys at the bottom of your screen and remaps the workstation's keyboard to

represent the keyboard and functions normally found at a 3278 terminal.

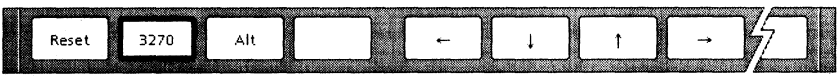
Besides the virtual function keys that are displayed automatically, you can display the keyboard's new meanings on the screen in a virtual keyboard window.

The 3270 emulator uses two virtual keyboards: the 3270 Main keyboard and the 3270 Alternate keyboard. Additionally, a Ten-Key Pad is available, which you can configure to send Ten-Key Pad numbers, PF key sequences, or both. These keyboards are described in the following sections.

3270 virtual function keys

The set of virtual function keys that first displays is shown in Figure 7-6 and explained below.

Figure 7-6 **3270 virtual function keys (6085 workstation)**



Note: Key labels and positioning are different for the 6085 and 8010 workstations.

The 3270 virtual function keys include:

<Reset>
Equivalent to the 3278 <RESET> key.

<3270>
Used to return to the 3270 Main keyboard from the alternate keyboard.

<Alt>
Used to go to the 3270 Alternate keyboard, which contains additional keys found on the 3278 terminal.

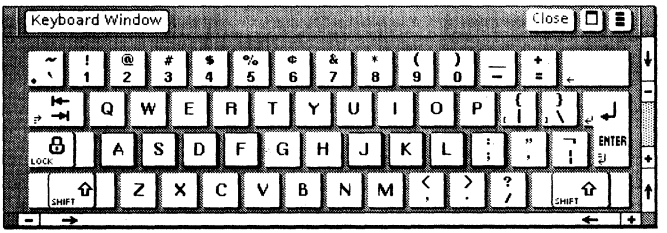
Arrow keys
: Equivalent to the 3278 Model 2 cursor control keys.

3270 Main keyboard

When the emulation window is active, you can display the 3270 Main keyboard by pressing and releasing the <KEYBOARD> key together with the function key corresponding to <Show>. (If you hold down the <KEYBOARD> key, the 3270 Alternate keyboard displays.)

Figure 7-7 illustrates the 3270 Main keyboard for the 6085 workstation.

Figure 7-7 **3270 Main keyboard (6085 workstation)**



Select anywhere outside the emulation window to return the keyboard to its original meanings.

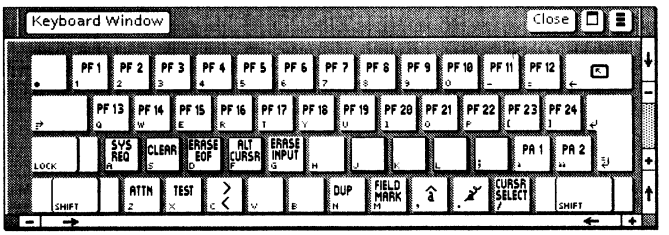
Note: While the emulation window is active, you can change the meaning of the keyboard to an inappropriate setting by pressing <KEYBOARD> and selecting a different setting. For example, you can select the ViewPoint Office keyboard setting while the emulation window is active. However, when you type inside the window, characters without equivalents in the 3270 character set appear as hyphens (-).

3270 Alternate keyboard

The 3270 Alternate keyboard contains 24 Program Function (PF) keys and several other keys that appear on a regular 3270 terminal but do not appear on the 3270 Main keyboard. Each PF key sends a unique Attention Identifier (AID) code to the host.

Figure 7-8 illustrates the 3270 Alternate keyboard for the 6085 workstation.

Figure 7-8 **3270 Alternate keyboard (6085 workstation)**



You can use the 3270 Alternate keyboard in one of two ways. The first is temporary and allows you to send one or two alternate key strokes before returning to the main keyboard. The second way allows you to display and use the alternate keyboard more extensively.

To temporarily use the 3270 Alternate keyboard:

1. Select inside the 3270 window.
2. Hold down the <KEYBOARD> key. The virtual keyboard is mapped to the 3270 Alternate keyboard.
3. Press the virtual function key labeled <Show> for a visual representation of the keyboard, and then press the desired emulation key.

4. Press the key corresponding to the desired alternate key.

5. Release the <KEYBOARD> key. The virtual keyboard is remapped to the 3270 Main keyboard.

To use the 3270 Alternate keyboard more extensively:

1. Press the 3270 virtual function key labeled <Alt>. The virtual keyboard is mapped to the 3270 alternate keyboard and remains mapped even after you release the <Alt> key.

2. To temporarily use the 3270 Main keyboard while the alternate keyboard is set, you can hold down the <KEYBOARD> key and type the desired keys.

3. Press the function key corresponding to <3270> again to return the virtual keyboard to the 3270 Main keyboard.

Ten-Key Pad

In addition to the 3270 Alternate keyboard, you can use the PF keys from the Ten-Key Pad. On the 6085 workstation, when you display the 3270 Main keyboard, the Ten-Key Pad window displays beside it. On the 8010 workstation, when you display the 3270 Main keyboard, two key pad windows display beside it: the regular 8010 key pad and the Ten-Key Pad.

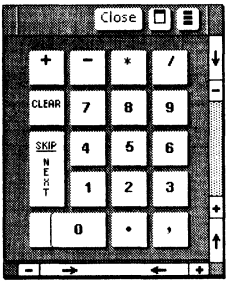
To use the Ten-Key Pad for PF keys, you first configure the Ten-Key Pad to supply the PF key definitions. This alternate Ten-Key Pad makes it easy to use the PF keys while the 3270 Main keyboard remains displayed and active.

By modifying the **Default Keypad** property in the [3270 Emulation] section of your User Profile, you

can configure the Ten-Key Pad in one of the following three ways:

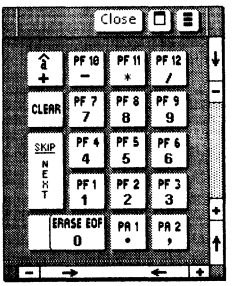
- NUMERIC: The Ten-Key Pad is a number pad. This is the default selection. Figure 7-9 shows the Ten-Key Pad window displayed when NUMERIC is selected.

Figure 7-9 **Numeric Ten-Key Pad**



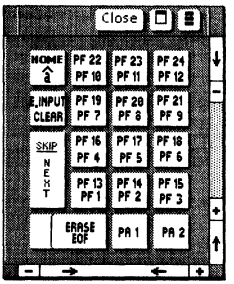
- PF1-12: When unshifted, the Ten-Key Pad is a number pad. When shifted, it is interpreted as PF1 through PF12. Figure 7-10 shows the Ten-Key Pad window when option PF1-12 is selected.

Figure 7-10 **PF1-12 Ten-Key Pad**



- PF1-24: When unshifted, the Ten-Key Pad is interpreted as PF1 through PF 12. When shifted, it is interpreted as PF13 through PF24. Figure 7-11 shows the Ten-Key Pad window when option PF1-24 is selected.

Figure 7-11 **PF1-24 Ten-Key Pad**



For details on how to modify your User Profile, see the *General User Reference* volume in this library.

To display the Ten-Key Pad window:

1. Select inside the emulation window.
2. Hold down the <KEYBOARD> key.
3. Press the function key corresponding to <Show>.
4. Release both keys.

A visual representation of the Ten-Key Pad appears next to the 3270 Main keyboard.

On a 6085 workstation, either you can use the physical key pad on the keyboard or you can select within the Ten-Key Pad window with the mouse to enter characters shown in the Ten-Key Pad window.

On an 8010 workstation, select within the Ten-Key Pad window with the mouse.

Conducting an emulation session

Before starting a session, you must first run the 3270 terminal emulation software in your loader, then retrieve the terminal emulator icon to your desktop.

An emulation session begins when the workstation establishes a connection with the desired host computer. You request this connection by opening the terminal emulator icon and starting the software.

To conduct a session, follow the documentation provided for the host computer environment and the applications you intend to use.

This section describes starting a session and lists the 3270 commands and orders supported by the emulator. It then describes transferring information to and from the host, including the [Make Screen] and [Snapshot] commands. Finally, it describes logging off and ending a session with the host.

Starting a session

To begin a session:

1. Open the 3270 icon, either from your desktop or from within a divider. The recommended way is from your desktop.

   If opening the terminal icon begins the session with the host, you can skip to step 4 below.

   If opening the terminal icon displays its option sheet, this means that [Display Options] is selected on the 3270 Terminal Emulator property sheet.

   Note: To accelerate opening the emulation window, set the desired properties on the

3270 Terminal Emulator property sheet and then deselect [Display Options]. As a result, the terminal emulator option sheet will not appear each time the emulator icon opens. Change the icon label as a reminder (for example, "Fast Open").

2. Select a terminal address or [Any].

3. Select [Start].

4. The emulation window opens, or a message appears to indicate why it could not be opened.

5. When the window displays the host greeting information and a prompt, move the mouse inside the window and click the left mouse button. This activates the window to accept the data you type in.

6. Log on to the host by entering your name, password, or any other information required by the host.

3270 commands

The following 3270 commands (both chained and unchained) are supported by *VP Terminal Emulation of IBM 3270* software:

- Erase All Unprotected
- Write
- Erase/Write

  The Erase/Write command performs several functions. First the software erases the character buffer by placing nulls in all buffer locations. This clears the screen. Then all character attributes are set to the default value of X'00'. The window is reset to the default window dimensions if the alternate window has been selected. Data is placed into a specified location in the character

buffer. The data is stored in consecutive locations.

- Erase/Write Alternate

  The Erase/Write Alternate command performs the same functions as the Erase/Write command and, in addition, resizes the emulation window to the alternate window dimensions.

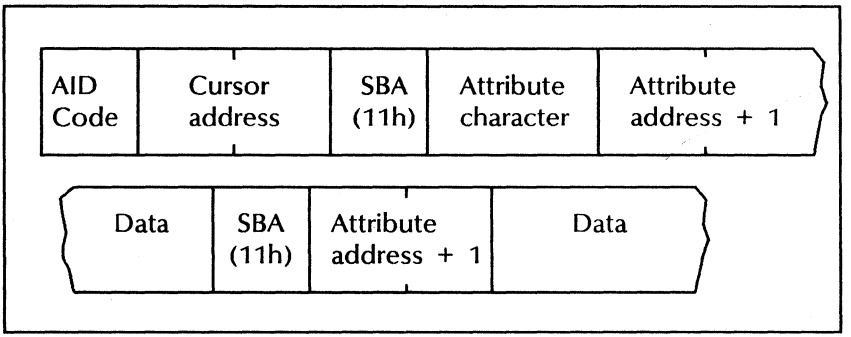
- Read Modified

- Read Modified All

  The Read Modified All (RMA) command transfers all fields that have the Modified Data Tag (MDT) bit set to modified. The MDT bit is set when you type data into an unprotected field, or the field is marked "modified" by the host application program. For an unchained RMA command, the search for modified fields, for transmission to the host, starts at buffer address 0. Null characters found in a modified field are suppressed.

  The format of the data stream consists of a three byte header which contains the Attention Identifier Code (AID), followed by a two byte cursor address. The three byte header is followed by data or a Set Buffer Address order (SBA). The SBA order is made up of three bytes. The first byte is the SBA code 11h followed by the two byte field attribute address. The field attribute address is the buffer address of the attribute character + 1. Figure 7-12 illustrates the format of the Read Modified All response data stream.

Figure 7-12 **Read Modified All response data stream**

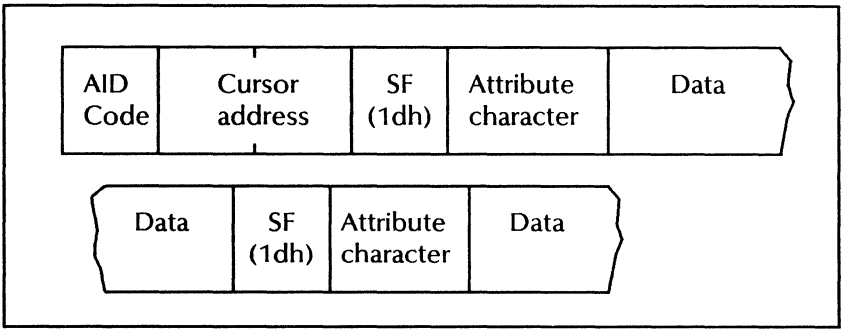


- Read Buffer

  The Read Buffer (RB) command causes all data that is in the display buffer to be transferred to the host. When the RB command is sent to the terminal unchained, the transmission of the data starts at buffer address 0. When the RB outbound data stream is issued as part of a chained command, the transmission of data starts at the current buffer address.

  The format of the data stream consists of a three byte header followed by data and/or the Start Field (SF) order. The first byte of the header contains the Attention Identifier Code (AID), followed by a two byte cursor address. The Start Field order is two bytes in length. The first byte is the SF code 1dh followed by the field attribute character. This order marks the beginning of a defined field in the display buffer. Figure 7-13 illustrates the the format of the Read Buffer response data stream.

Figure 7-13 **Read Buffer response data stream**



For details about chained and unchained commands, consult the IBM *3270 Information Display Systems Component Description.*

3270 host orders

The emulation software acts on the following orders from the host:

- Set Buffer Address (SBA)
- Start Field (SF)
- Insert Cursor (IC)
- Program Tab (PT)
- Repeat to Address (RA)
- Erase All Unprotected to Address

Copying and moving text to the host

The emulator allows you to transfer text from desktop documents to a host computer:

1. Select the desired text that is to be transferred.
2. Press <COPY> or <MOVE>, as appropriate.

3. Select the destination inside the 3270 window. The cursor marks the location in which the next character will be inserted.

Text cannot be copied inside the same emulator window. It can only be copied from one emulator window to another emulator window. However, you can use the [Snapshot] command (described below) to temporarily capture an entire window, and then you can copy text from your [Snapshot] back into the window.

When you move or copy information into a 3270 window, the following changes take place:

- Character properties are ignored.
- Characters or symbols without emulation equivalents appear as question marks.
- New line and new paragraph characters are converted to standard carriage returns.

Make Screen: Transferring a 3270 screen to document form

When you select [Make Screen], a single screen of information is transferred from the emulation window into a document.

Note: In addition to [Make Screen], the 3270 emulator allows you to transfer files from the host by using the *3270 File Transfer* application. This application is described in the *VP IBM 3270 File Transfer* part of this volume.

To use [Make Screen], you must have the *VP Document Editor* running in your loader.

To transfer information from an emulation window, run the session until the desired information appears on the screen, and then select [Make Screen] in the window header. This information appears as a document icon with the

3270 icon's name and a time stamp. For example:

CICS/CMS of 4-MAR-88 11:46:52PST

Once you capture information using [Make Screen], you can manipulate the resulting document as you would any other document. This includes printing, filing, formatting, editing, and mailing.

You can use *VP Data Capture* to run such information through a program that formats it as a table. This feature allows you to transfer data easily into record files or bar charts. *VP Data Capture* is described in the *VP Data Capture* part of this volume.

Snapshot: Creating temporary read-only displays

You can capture the contents of a single 3270 display for temporary viewing by selecting [Snapshot]. The contents of a [Snapshot] window display in read-only format and do not change even though changes may occur in the emulation window. The size of the snapshot directly corresponds to the emulation window size. [Snapshot] information can be used as follows:

- To make a temporary screen copy for viewing. For example, by making snapshots of several 3270 emulation windows, you can refer to data conveniently later in the session by looking at the [Snapshot] windows, instead of using the host application to redisplay previously viewed data in the emulation window.

- To copy information to an 3270 emulation window. When a snapshot is made of a 3270 emulator screen, the data can be copied back to the 3270 window. The data always takes on the attributes of the destination field. (Refer to "Selecting text in emulator and [Snapshot] windows" for details on fields.)

- To copy information to a document. When text is copied from a [Snapshot] window to a document, the field attributes are not copied. However, the properties of the attribute are retained with the copied text.

You can create as many [Snapshot] windows as you want. However, once you select [Close] on either the 3270 window menu or the [Snapshot] window menu, the [Snapshot] information is deleted. In this way, [Snapshot] information is temporary (unlike [Make Screen] information, which remains in a desktop document after the emulator is closed).

To copy information from the emulation window to a snapshot, run the session until the desired information appears on the screen, and then select [Snapshot]. The information appears in a window titled "ReadOnlySnapof," followed by the title of the 3270 display window, the date, and the time. For example:

ReadOnlySnapof327015-Aug-88 15:52:17

Select [Close] at the top of the [Snapshot] window to delete the window.

Selecting text in emulator and Snapshot windows

You can select text from a [Snapshot] window or a 3270 window in one of two ways: You can select text as "unstructured text" to ignore "field" boundaries or as "structured text" to select fields as a whole. A *field* is a sequence of characters that begins with an invisible field attribute character and extends to (but does not include) the next field attribute character. The field attribute character defines the field. A field can wrap around from the bottom of the display to the top.

Fields can be either protected (do not permit you to enter information) or unprotected (allow you to change their contents). Text from the host

computer is generally protected, and text you enter is unprotected.

Selecting unstructured text

"Unstructured text" is any string of characters, ignoring 3270 field definitions. To select unstructured text, click the left mouse button anywhere except on the character that defines a field. (Generally, the character that defines a field appears between words as a blank.)

Either in the emulation window or the [Snapshot] window, you can select text in units:

- One click selects a character.
- Two clicks select a word.
- Three clicks select the contents of a field.
- Four clicks select the entire window.
- Five clicks select a character.

Unstructured text can also be selected by the select-adjust method (using both mouse buttons). You can extend the selection by the same unit of text as originally selected. For example, if a word has been selected and you press the right button anywhere in the middle of another word, the selection is extended up to the end of that word.

An extended unstructured text selection may wrap around from the bottom of the display to the top.

Selecting structured text

"Structured text" is a sequence of one or more fields. You select a field by clicking on the character that defines it. The field attribute character appears as a blank on the screen; however, when you select this character, the entire field appears highlighted.

To select structured text, click the left mouse button on the character that defines the field.

You can also select structured text using the select-adjust method:

1. Select the field attribute character with the left mouse button, and then hold the right mouse button.

2. Move the cursor. The highlighting shows you an entire field at a time. All extended selections of fields leave the 3270 cursor positioned at the first character of the last field in the selection.

Finally, you can select a field by clicking three times as mentioned in the "Selecting unstructured text" section, then extending as described above.

Copying fields

When you copy fields to a 3270 window, the first field of the selected text is copied into the first field; the second field is copied into the second field; and so forth.

If a field in the 3270 window is protected, you cannot copy information to that field. The emulator skips that field (in both the source and destination) and continues to the next one that accepts data. If the number of characters in the text is greater than the width of the field, any excess characters are eliminated.

When text or fields are copied into a 3270 screen, the copied characters take on the attributes of the destination field(s). Only the host computer is allowed to change the attribute-defining character.

Ending a session

Once you have completed the tasks you need to perform on the host computer, remember to log off.

Closing the emulation window alone does not automatically log you off the host computer. A

session may continue after you close the emulation window, costing you time on the host and presenting possible security problems.

To end an emulation session:

1. At the host prompt, type the log-off command your host recognizes.

2. Select [Close] at the top of the emulation window.

Part 2

VP IBM 3270 File Transfer

8. VP IBM 3270 File Transfer

No additional hardware is required for your 6085/8010 workstation to transfer data files between your workstation and IBM hosts. This task is accomplished when you use the *VP IBM 3270 File Transfer* application, working in conjunction with the *VP Terminal Emulation of IBM 3270* application.

When you use 3270 File Transfer, the 6085/8010 workstation appears to the host as an IBM 3270 PC issuing a file transfer request to send or receive files.

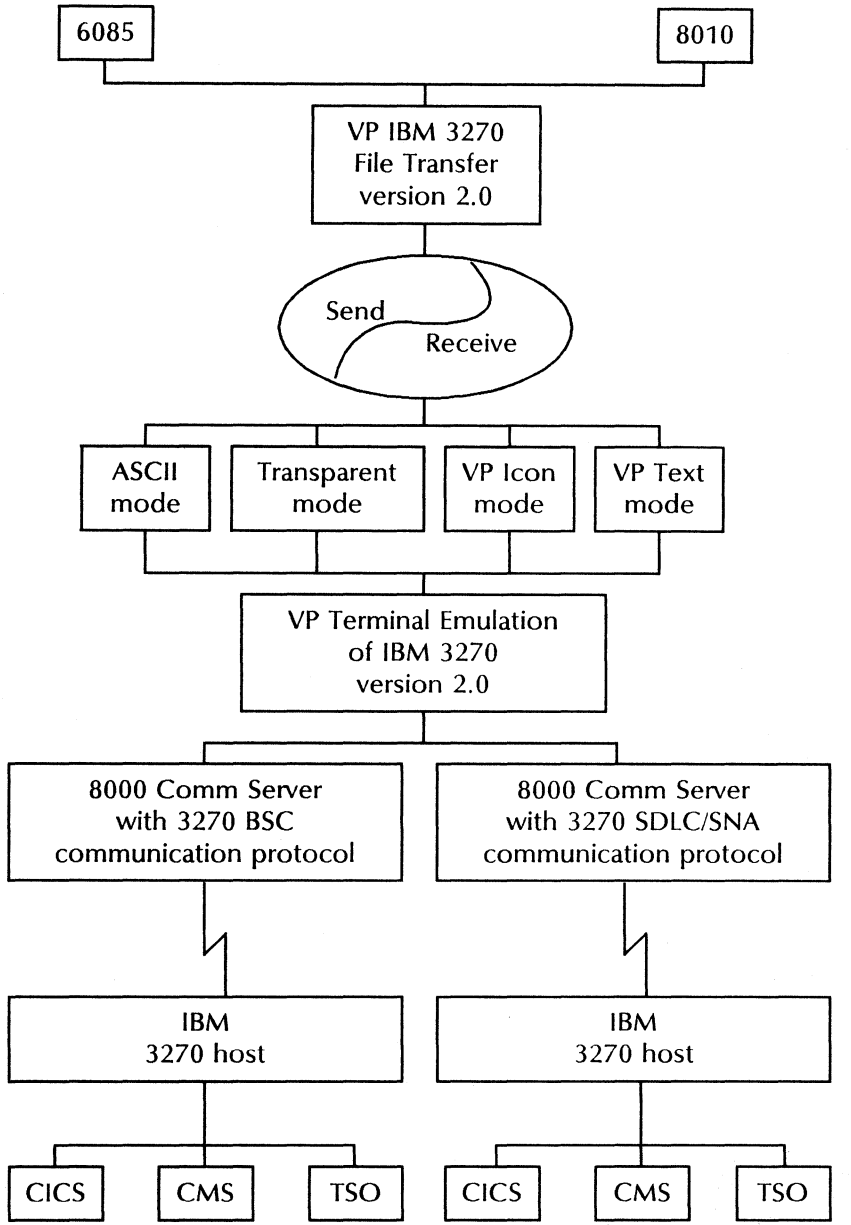
Note: 3270 File Transfer gives you access to a wide variety of host environments and facilities. You must know how to use these facilities to use the file transfer application effectively.

The *VP IBM 3270 File Transfer* application requires the *VP Terminal Emulation of IBM 3270* application to provide the 3270 host connection to the ViewPoint workstation. This connection is made via the Ethernet with the Services 10.0 (and later) External Communication Service (ECS).

The ECS emulates an IBM 3276 controller using 3270 SDLC/SNA or 3270 BSC communication protocol on the 8000 server.

The following diagram (Figure 8-1) depicts file transfer as one of many elements in a system design of workstation, server, communication protocols, and host computers.

Figure 8-1 **Schematic for *VP IBM 3270 File Transfer***



3270 file transfer capabilities

The 3270 File Transfer allows you to exchange text and binary data files between the workstation and the host. Specifically, text files include ViewPoint (VP) documents and WordStar text files. Binary data files include MS-DOS files.

Each host is set up differently requiring you to work closely with host support individuals to determine the initial parameters for file transfer.

3270 File Transfer provides many file exchange benefits between ViewPoint and IBM 3270 hosts. Through the IBM 3270 emulation icon, 3270 File Transfer enables you to:

- Provide direct workstation-to-host file transfer without using the Remote Batch Service.
- Archive files to the 3270 host.
- Import text and data from the host for use with ViewPoint desktop publishing features.
- Exchange information with non-Ethernet devices such as a PC with 3270 capabilities.
- Retain file transfer parameters for repetitive file transfer routines.
- Set properties and options for parameter selection instead of long strings of abbreviations that may need to be re-entered if not exactly correct.
- Transfer/store multiple files at one time.
- Transfer single or multiple files in the background so you can continue to use other desktop features during file transfer, including initiating up to eight file transfer processes in other 3270 windows.

Performance is relative to the modem speeds used for communication and the time sharing and processing times of all system elements.

Key concepts of 3270 file transfer

IBM mainframe application requirements, naming conventions, and modes of transfer are key concepts for file transfer.

IBM host environments

3270 file transfer sends and receives files to and from an IBM mainframe running one of the following host file transfer programs (*IND$FILE* MODULE):

- *CICS/VS* 5798-DQH, Version 1.00
  Customer Information Control System/Virtual Storage
- *VM/CMS* 5664-281, Version 1.00
  Virtual Machine/Conversational Monitor System
- *MVS/TSO* 5665-311, Version 1.00
  Multiple Virtual Storage/Time Sharing Option

Step by step instructions for setting the Send and Receive properties for each *host environment* are provided in the *VP IBM 3270 File Transfer Training* guide.

ViewPoint icon naming conventions

The name of the ViewPoint icon must conform with the host's string file name syntax before a transfer can be made. The naming conventions for each of the three host environments (TSO, CMS, CICS) are different. If a name is entered incorrectly, an error message is displayed in the emulation window, and the file transfer operation

is aborted. The three naming conventions are described below:

- **TSO** files are called data sets and can be entered in a full or a partial data set name format. A member of a partitioned *data set* can be specified only if the data set exists on the host.

  You can enter passwords for TSO files by typing a slash (/) followed by the password. The valid characters that may display in a TSO data set name are A through Z, a through z, 0 through 9, and period (.). Embedded blanks are ignored.

  A data set name can be made up of several fields separated by a period. Each field length must not exceed 8 characters. The maximum length for a valid TSO file name is 44 characters. This includes embedded periods.

  File transfer only works in native TSO, not the menu-driven Interactive Structure Programming Facility (ISPF).

- **CMS** file names must be 1 to 8 characters in length and must begin with an alphanumeric character. The valid characters are A through Z, a through z, and 0 through 9.

- **CICS** file names must be 1 to 8 characters in length and must begin with an alphanumeric character. The valid characters that may display in a CICS data file name are A through Z, a through z, and 0 through 9. Typical CICS file names would be program names, transaction IDs, or CICS programmer designations.

Note: For more detailed information on host naming conventions, see Appendix J.

Four modes of file transfer

Since you can transfer files to the host for either storage or exchange purposes, four modes of file transfer are provided:

- ASCII Mode
  - For storing ASCII (American Standard Code for Information Interchange) objects on the host in an IBM readable format (EBCDIC character set)
  - For retrieving EBCDIC text as an ASCII icon on the ViewPoint desktop for further ViewPoint file conversion or for use with *VP PC Emulation*
- Transparent Mode
  - For exchanging binary data files without EBCDIC character translation. The icon properties and filing structures are ignored; only the content is sent. Binary data files are files such as the MS-DOS program, dBASE III data files, Lotus spreadsheets, or DCA files.
- VP Icon Mode
  - For archiving any ViewPoint icon object on the host and for retrieving it back onto a ViewPoint desktop as an icon
- VP Text Mode
  - For storing the text-only contents of a ViewPoint document icon on the host in an IBM readable format (EBCDIC character set)
  - For retrieving an EBCDIC text file and transferring it to a ViewPoint document icon

Facts about Send and Receive transfer modes:

- When you transfer files from ASCII or VP Text to the host (upload), the host converts the text to EBCDIC.
- ASCII, VP Text, and Transparent modes upload only the first level (topmost file) of a container (folder or file drawer).
- VP Icon uploads and downloads multiple levels within a folder or other container as one file.
- ViewPoint can upload multiple documents in a folder of documents at once but can download only one document at a time.

File transfer planning

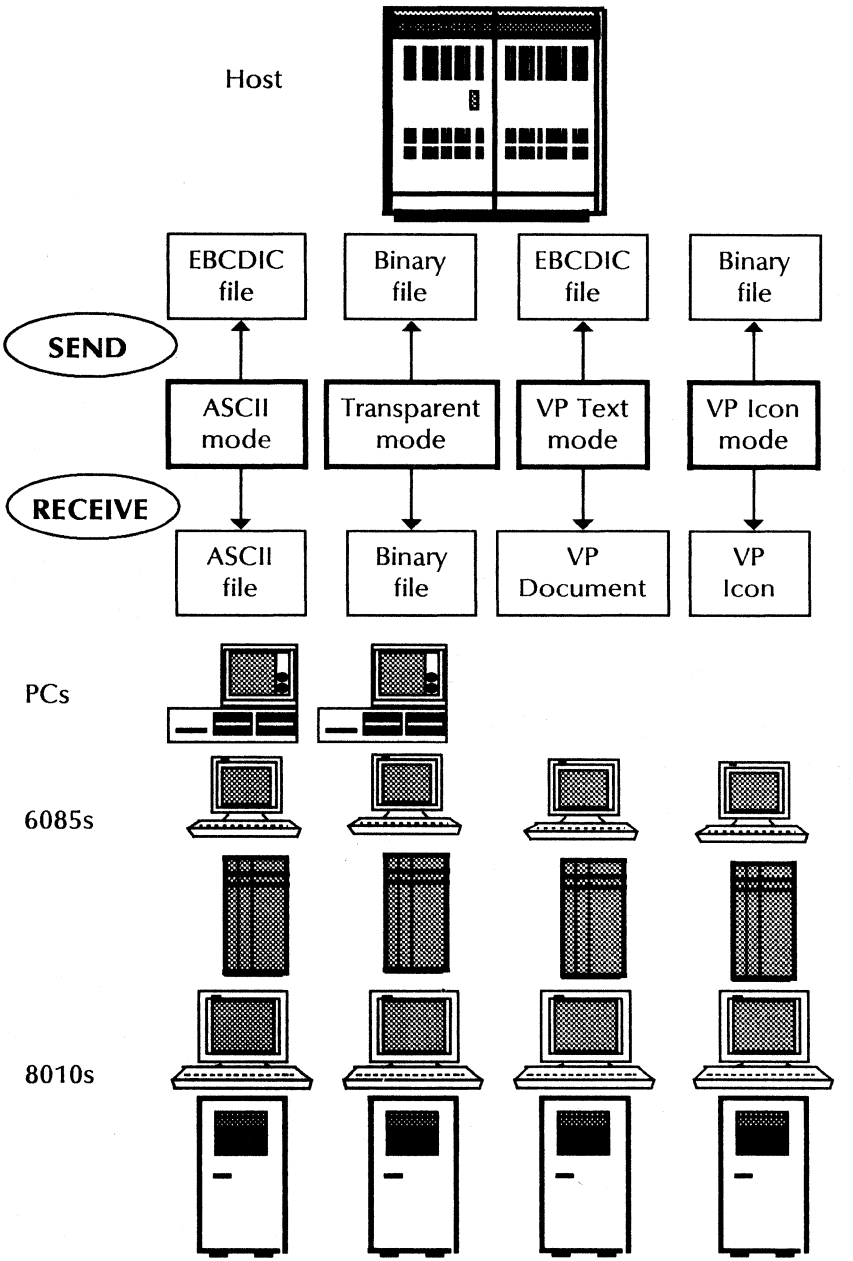
Although a round trip file transfer (sending and receiving in the same mode of transfer) has predictable results, a cross trip (sending and receiving the same file in different modes) does not have predictable results.

There can be over 200 cross-trip combinations, based on multiple kinds of transfers (ViewPoint workstations, PCs with IRMA cards [an IRMA card is part of a DCA file transfer program] or IBM PC/3270s), and multiple kinds of transfer modes (ASCII, transparent, VP Text, and VP Icon).

Knowing the contents of a file on the host is critical to a successful ViewPoint file transfer. Normally, one user informs another about what type of file was stored on the host, so that the file can be transferred back in a predictable way. This applies to PC users, host programmers, or ViewPoint workstation users.

Figure 8-2 should be helpful in predicting the most useful mode of file transfer to accomplish your goals.

Figure 8-2 **Round trip vs. cross trip planner**



Naming conventions for the host environments are explained in detail in Appendix J.

Basic emulation

Once a connection has been made using the steps previously described in "Starting an emulation session for file transfer," you can begin a session.

Prior to a transfer operation, your 3270 session must be in a native command mode. In native command mode, commands are issued to perform tasks.

To conduct a session, follow the normal instructions for running programs as defined by the host computer. Use the mouse to select the position where you want the caret to appear. The mouse may be used in conjunction with the four alternate function keys that emulate the cursor keys found on the IBM 3278 keyboard.

Important facts about file transfer

- When transferring a ViewPoint icon to the host, you must define the record format of the host file as either variable or undefined. This prevents the last record of the file from being padded with data that is not a part of the ViewPoint icon.
- After transferring a ViewPoint icon to the host, verify the transfer by transferring the file back to the workstation. If the result of the transfer does not produce an icon, then delete the file on the host and transfer the icon again.
- If a ViewPoint object that is a container (such as a folder, mail folder, or mail basket) is selected for a VP Icon transfer, the container and its contents will be transferred as a single

file. The name of the container object will be used for the name of the file on the host.

- If a ViewPoint file drawer icon is transferred to the host in VP Icon mode, only the icon object is transferred and not the contents of the file drawer, which is located on a different device, namely an 8000 server.

- It is recommended, when doing a VP Text or ASCII transfer Send operation, that you use a variable record format with the [Append Carriage Return and Line Feed] option enabled.

- Files transferred to the host with the [Transparent] mode selected should be transferred with a variable-length record format or an undefined record format. This prevents the last record of the file from being padded with extra data.

- Files of different types should not be transferred in a multiple Send operation. For example, an ASCII file and a binary file should not be transferred as a multiple Send operation.

- All transfer operations are copy operations.

- If one of the files in a multiple file transfer operation does not transfer successfully, the file transfer operation stops. The remaining files will not be transferred. No historic record of the files is kept.

- Sending a duplicate file name to the host overwrites the file on the host.

- If the content of a VP Icon file that was transferred to the host is changed at the host, do not transfer the file back, because you will not be able to use the file at your workstation.

- If [Append to File] is selected, the contents of the multiple icons selected are appended to

the same host file name specified in the Send option sheet.

If the [Append to File] option is not selected in the Send option sheet, then each individual icon name is used to identify the host file to which it must append.

- When you select multiple icons for transfer to the host, the icons are transferred in the order selected.
- Transfer requirements are determined by each user according to the document's recipients and use. See Appendix K for some typical user scenarios.
- Performing desktop operations (such as opening or moving) on a busy icon will lead to unpredictable results.

Refer to the "VP Terminal Emulation of IBM 3270" chapter in this volume for constraints specific to IBM 3270 emulation.

3270 emulator icon

The 3270 emulator icon is the main tool used to perform a file transfer. Figure 8-3 shows an IBM 3270 emulator icon.

Figure 8-3 **IBM 3270 emulator icon**

When you install file transfer, it is necessary to delete any IBM 3270 icons currently on the desktop and retrieve a new IBM 3270 icon from

the IBM 3270 emulators divider, which is located in the Network divider of the directory. This divider lists all the 3270 emulators for the domain. For more details on retrieving a 3270 emulator icon, refer to the "VP Terminal Emulation of IBM 3270" chapter in this volume.

A number of emulator icons, each representing a different access path from the Xerox network to a specific host computer, can reside on the desktop. One icon, for example, might represent a port set up to support communication to a company's own computer, while another might represent a port set up for a connection to an outside data base.

Note: The same operations can be performed with emulator icons inside the divider as with those on the desktop, with the exception of using <PROP'S>.

File Transfer Receive

When you select [File Transfer Receive] in the 3270 Terminal Emulator properties sheet, all Receive options are displayed. You set these options based on the type of files being transferred and the host environment involved. The first time you open the property sheet, the Receive options default to MVS/TSO.

Changes made to the Receive property sheet are applied when you select [Done]. When you select [Cancel], no changes are made to the property sheet.

When you start a file transfer Receive operation, the default IBM host program, IND$FILE MODULE, is invoked from the workstation. Selecting [Other] enables you to type in a new host file transfer name. This option enables you to try your own unique host file transfer programs

to see if they are compatible with the *VP IBM 3270 File Transfer* application.

An alarm (beep) is sounded at the completion of the file transfer, and the **Download from Host** status indicator disappears. The received file appears, as close as possible, to the lower right corner of the screen.

When you are receiving a file transfer, you set the transfer mode based on the content of the file being transferred. For example, you can transfer a file that consists of EBCDIC characters with transfer mode settings of ASCII or VP Text, while a binary data file is transferred with a transfer mode setting of Transparent.

See Appendix G for a detailed translation table for transferring EBCDIC format character code files to ViewPoint format characters files. Table 8-1 is a summary of the available Receive transfer mode settings based on the contents of a file.

Table 8-1 **Receive transfer modes**

Transfer mode selected	Source file on host	Destination object on VP desktop
VP Text	EBCDIC text	VP document icon
VP Icon	Any VP object previously transferred to the host with a transfer mode setting of [VP Icon]	VP object returned to original state unless the contents were altered after it was archived. **CAUTION:** Any tampering with archived host objects will destroy data.
ASCII	EBCDIC text	ASCII icon
Transparent	Binary data file	Binary data file

File Transfer Send

Files must reside on the desktop for transfer to the host. Files that are in remote file drawers must be copied to the desktop before they can be transferred.

You can transfer files that are in folders when the folder is either closed or open. When you select a closed folder, only the top level files are transferred (except for VP Icon mode, which transfers the entire folder as one file). Folders that reside on the top level of a folder are ignored.

When a folder is open, you select the files within the folder that you want to transfer.

Files on a PC virtual floppy or the PC emulated fixed disk must be moved to the desktop to be transferred.

Note: While a file transfer is in progress, the selected files are not accessible. Any attempt to manipulate them results in an error message being posted in the desktop message area.

When you select [File Transfer Send] in the 3270 emulation property sheet, all Send options are displayed. You set these options based on the type of files being transferred and the host environment involved. The first time you open the property sheet, the Send options default to MVS/TSO.

Changes made to the Send property sheet are applied when you select [Done]. When you select [Cancel], no changes are made to the property sheet.

When you start a file transfer Send operation, the default IBM host program, IND$FILE MODULE, is invoked from the workstation. Selecting [Other] enables you to type in a new host file transfer

program name. This option enables you to try your own unique host file transfer programs to see if they are compatible with the *VP IBM 3270 File Transfer* application.

An alarm (beep) is sounded at the completion of the file transfer and the **Upload to Host** status indicator disappears. Table 8-2 summarizes the available Send transfer mode settings for VP Icon objects.

Table 8-2 **Send transfer modes**

Transfer mode	Source icon on VP desktop	Destination file on host
VP Text	ViewPoint document Folder of VP documents	EBCDIC text file **Note:** Minor editing may be required of destination file.
VP Icon	ViewPoint icon object Any icon on the VP desktop	Binary data file **CAUTION:** Any tampering with icon file on the host will destroy data.
ASCII	Non-ViewPoint objects for example, WordStar ASCII text files	EBCDIC text file **Note:** Minor editing may be required of destination file.
Transparent	Non-ViewPoint objects for example, MS-DOS binary files	Binary data file
	ViewPoint objects for example, ViewPoint document, ViewPoint record file	Binary data file **CAUTION:** Transferring a ViewPoint icon to the host will result in the loss of ViewPoint filing structures and the icon's properties.

When sending a file, you set the transfer mode based on the type of icon you select for transfer.

You can transfer specific icons under specific transfer mode settings. For example, ViewPoint documents should only be transferred with mode settings of [VP Text] or [VP Icon], while 860 documents can only be transferred with a transfer mode settings of [Transparent] or [VP Icon]. Unpredictable results will occur if the appropriate transfer mode is not selected.

To ensure a successful file transfer, you must follow the host file naming conventions. Refer to Appendix J for detailed information on the naming conventions for each host environment.

See Appendix G for a detailed translation table for transferring ViewPoint format character codes to EBCDIC format character codes.

3270 Terminal Emulator properties sheet

The 3270 Terminal Emulator properties sheet appears when you select the 3270 icon and press <PROP'S>.

When *VP IBM 3270 File Transfer* is loaded, enabled, and running, the following sets of options can be displayed separately through the 3270 Terminal Emulator property sheet:

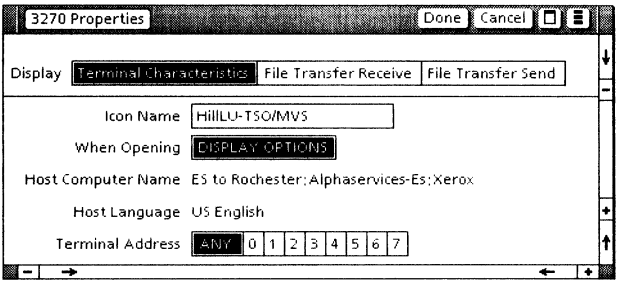
- [Terminal Characteristics]
- [File Transfer Receive]
- [File Transfer Send]

Use the 3270 properties sheet (Figure 8-4) to set the options for a file transfer session. This information is retained when the session is ended.

The 3270 properties sheet is divided into two areas: a property sheet **Display** area and an options area.

Note: The 3270 properties sheet contains the same properties as the 3270 option sheet, with the following additional items: **Icon Name** and **When Opening**.

Figure 8-4 **3270 properties sheet**



Properties and options

The following options appear in the **Display** area of the property sheet:

Display
Contains three property sheet selections. When you select one of these items, corresponding properties display in the options area of the property sheet.

[Terminal Characteristics]
Displays the terminal characteristics of the 3270 icon. The options on this display are described in this section.

[File Transfer Receive]
Causes the file transfer Receive options to be displayed. These options are described in the section titled "File Transfer Receive."

[File Transfer Send]
Causes the file transfer Send options to be displayed. These options are

described in the section titled "File Transfer Send."

The following properties and options display in the options area of the 3270 properties sheet:

Icon Name
Use to change the name of the emulator icon on the desktop. This allows each 3270 icon to be uniquely named.

When Opening
Selecting [Display Options] causes the option sheet to display the next time the 3270 window is opened. If [Display Options] is not selected, the 3270 option sheet does not open, and all items set on the property sheet are used for that session.

Host Computer Name
Contains the name of the IBM host in read-only format. Available after an IBM SNA host is added or changed at the ECS and the Clearinghouse is updated.

Host Language
Displays the host language of the IBM system in read-only format. It allows the 3270 window to properly translate codes sent from the IBM host and to properly interpret the 3270 keyboard keys to emulate the desired I/O interface code.

Terminal Address
Allows you to assign an emulation session to a certain terminal address by selecting one from a list of displayed choices. If the choice is already in use, the connection is not made, and an appropriate message is displayed. If the address is not important, [Any] should be selected; the first available address will be assigned.

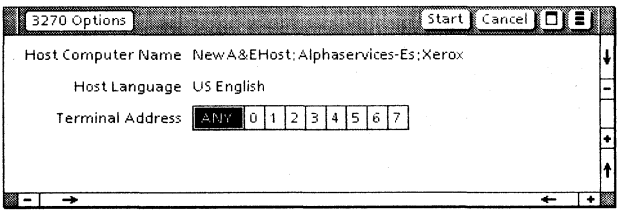
3270 option sheet

Use the 3270 option sheet (Figure 8-5) to set the options that control the host connections. This option sheet appears when you select the 3270 icon and press <OPEN>. (The option sheet only appears when [Display Options] is selected on the emulator's property sheet.)

The information you set in the option sheet is used for the duration of the 3270 session. When the 3270 window closes, the options default to the 3270 emulator icon property sheet settings. The [File Transfer Send] and [File Transfer Receive] options do not display on the 3270 option sheet.

The 3270 option sheet contains the same properties as the 3270 property sheet, except for the **Icon Name** and **When Opening** properties. Refer to the descriptions of the 3270 property sheet earlier in this chapter for complete information pertaining to the 3270 option sheet.

Figure 8-5 **3270 option sheet**

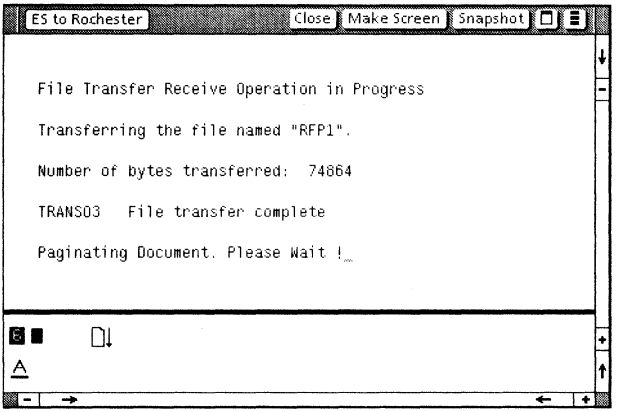


3270 emulation window

When you open the 3270 icon and select [Start], the 3270 window (Figure 8-6) appears. This means the connection with the host computer is successfully completed.

You can open a 3270 window icon when it is on the desktop or within a divider.

Figure 8-6 **3270 window**



To accelerate opening an emulation window, set the desired options in the 3270 property sheet and then deselect [Display Options]. As a result, the 3270 option sheet will not appear each time the emulator icon opens. Change the icon label as a reminder (for example, "Set Options" or "Fast Open").

The file transfer Send and Receive options sheets display when you select [Send] or [Receive] in the 3270 window's auxiliary menu.

You must be logged on, in command mode, and the 3270 emulation window must be active with the "Ready" or "Running" prompt displayed before you can use the *VP IBM 3270 File Transfer* software.

When a connection is made to a host computer, the 3270 window displays two screen areas: the main text area and the status area. Data that travels to and from the host displays in the main

text area, and graphic status indicators display in the status area.

- **Main text area**—When an emulator window opens in an SNA environment, the window dimensions are set to the default capacity of 1920 characters with a 24-row by 80-column format.

  The window expands into the alternate window when an Erase/Write/Alternate command is received from the host computer. The window remains in the alternate size until one of the following takes effect: <CLEAR> or <SYS REQ> (SNA only) is pressed, or an Erase/Write command is received.

  At the start of a logical unit (LU) session, the 3270 host computer sends the terminal presentation data. This data contains the default and alternate window dimensions (bind presentation data) for the LU session. When the host sends the bind presentation data, the emulation window adjusts accordingly.

  The emulation software accepts presentation data for an IBM 3278 Model 2, 3, 4, or 5. At the end of an LU session, the emulation window resets to the 24 by 80 default and alternate screen dimensions.

  Status and error messages generated during a file transfer operation display in the main text area. You cannot use the keyboard to send data during file transfer.

- **Screen status area**—The small area beneath the main text area is the status area. It contains all graphic status indicators and messages.

  Graphic figures and messages in this area are identical to those used in an actual 3270 display. Their meanings are found in

Appendix A of the IBM 3270 Information Display System description.

Two of these graphic figures, the ***Upload* to Host** and the ***Download* from Host**, are unique to *VP IBM 3270 File Transfer*. They display in the 3270 window only when the file transfer application is loaded and running. Figure 8-7 illustrates and explains the figures in the status area.

Figure 8-7 **Graphic status indicators**

Symbol	Name	Explanation
	Upload to Host	This status indicator is displayed when data is being prepared for transfer to the 3270 host, i.e., upload.
	Download from Host	This status indicator is displayed when data has been received from the host, i.e., download.
	IBM Time	This symbol is displayed when data is sent to the host for processing, and the file transfer program is waiting for a response from the host.

For more information on 3270 features, see the "VP Terminal Emulation of IBM 3270" chapter in this volume.

Menu commands

The following is a description of the menu commands that are specific to 3270 emulation when 3270 File Transfer is running. These commands are located in the gray area at the top of the 3270 window.

[Make Screen]
Captures the information currently displayed on the screen and copies it into a ViewPoint document. The captured information displays as defined by the screen width and height set on the icon's property sheet. The document title is in the following form:

<icon name> of <date/time of day>

The document can be renamed through its property sheet.

[Snapshot]
Captures the information currently displayed on the screen and copies it into a read-only display. You may make multiple snapshots of different screen information. This information can be selected and copied, but it cannot be moved.

Snapshot contents are intended for temporary use. When you select [Close], the information is deleted. The snapshot title is in the following form:

ReadOnlySnapof <Title of the 3270 window, date and time>

The following items are found in the floating items auxiliary menu.

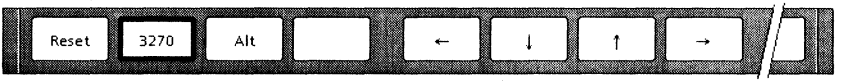
[Send]
Opens the file transfer 3270 Send option sheet. You select options in the Send option sheet for compatibility with the host environment and the type of files you are transferring.

[Receive]
Opens the file transfer 3270 Receive option sheet. You select options in the Receive option sheet for compatibility with the host environment and the file transfer mode you select.

Virtual function keys

When you select inside the emulation window, the 3270 virtual function keys (Figure 8-8) appear.

Figure 8-8 **Virtual function key layout**



Note: Key labels and positioning are different for the 6085 and 8010 workstations.

The virtual function keys include:

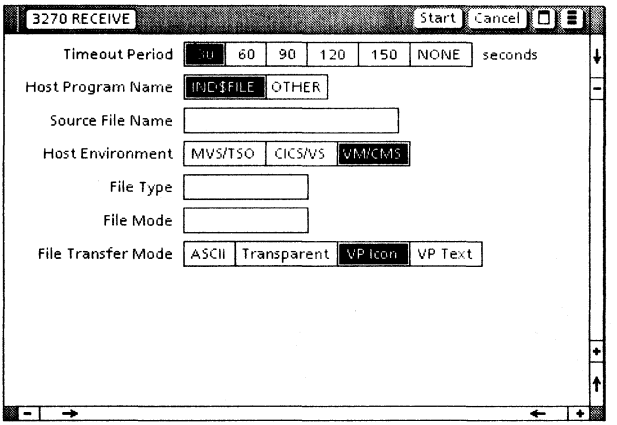
- <RESET> — equivalent to the 3270 <RESET> key.
- <3270> — is used to return to the main 3270 keyboard from the alternate keyboard.
- <ALT> — is used to go to the 3270 alternate keyboard, which contains additional keys found on the 3270 terminal.
- Arrow keys — equivalent to the four cursor keys on the 3278 display station for manipulating the 3270 cursor.

A 3270 virtual keyboard and a Ten-Key Pad is provided with your 3270 emulation software. For more information on these features refer to *VP Terminal Emulation of IBM 3270* in this volume.

3270 Receive option sheet

Use the 3270 Receive option sheet (Figure 8-9) to set the Receive transfer options. This sheet displays when you select the [Receive] command in the 3270 Emulator window auxiliary menu. It contains the same options as the Receive properties sheet, with the exception of the **Display** parameter. Refer to the descriptions of the 3270 Receive properties sheets later in this chapter for complete information pertaining to the 3270 Receive options.

Figure 8-9 **Receive option sheet CMS/VP Icon**



3270 properties sheet with Receive options displayed

The 3270 properties sheet displays when you select the 3270 icon and press <PROP'S>. Figures 8-10 through 8-14 show the [File Transfer Receive] options that you can display on this

properties sheet when 3270 File Transfer is running in your application loader.

When you select [File Transfer Receive] in the 3270 properties sheet, the available file transfer Receive options appear. When the properties sheet opens for the first time, the file transfer Receive options default to MVS/TSO options.

Added properties and options appear when you choose different **Host Environment** options on the 3270 Receive properties sheet.

You set the options based on the type of files you want to transfer and the host environment from which files will be transferred.

Step by step instructions for setting the Receive properties for each host environment are provided in the *VP IBM 3270 File Transfer Training* guide.

Figure 8-10 **Receive properties sheet CMS/ VP Text**

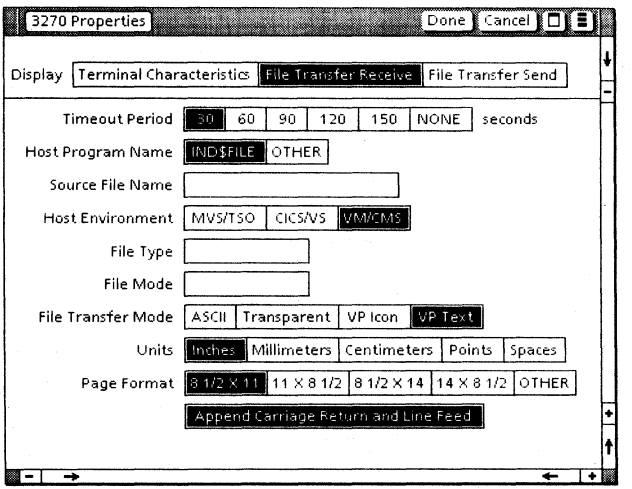


Figure 8-11 **Receive properties sheet TSO/ VP Text**

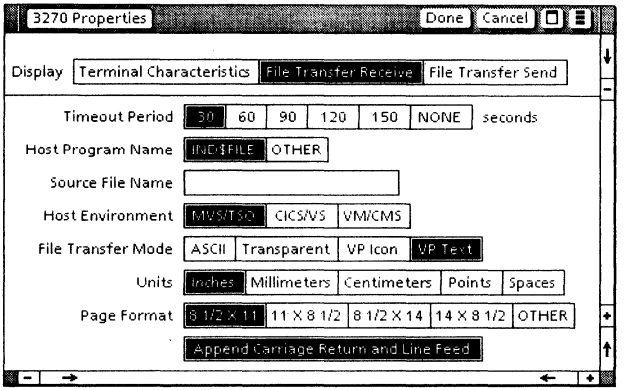


Figure 8-12 **Receive properties sheet TSO/ VP Icon**

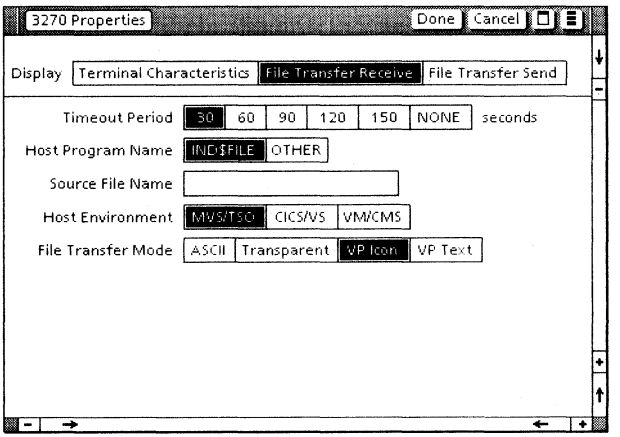


Figure 8-13 **Receive properties sheet TSO/ ASCII**

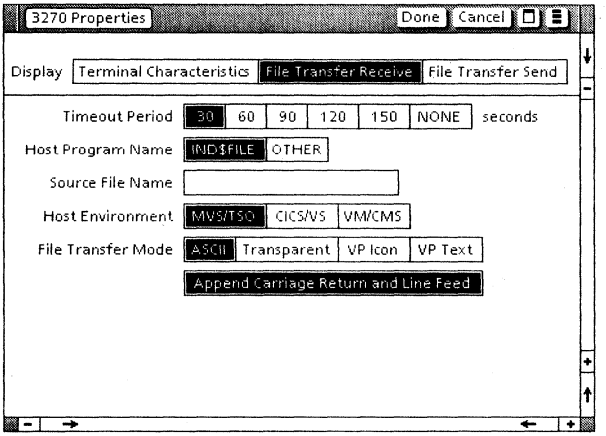
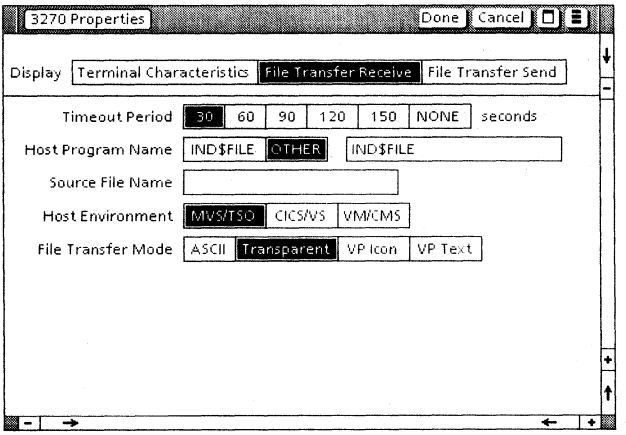


Figure 8-14 **Receive properties sheet TSO/ Transparent**



Note: The Receive option and properties sheets available for CICS are the same as those available for TSO.

Properties and options

The following is a list of the properties and options available when you select [File Transfer Receive] as the **Display** option on the 3270 properties sheet:

Timeout Period

Allows you to set the time frame in which the host must respond when a file transfer request is issued. If the host does not respond within the designated time period, the file transfer application issues one last request to start the transfer before aborting the operation.

[30]
After 30 seconds, the file transfer program aborts on the workstation. [30] is the default option.

[60]
After 60 seconds, the file transfer program aborts on the workstation.

[90]
After 90 seconds, the file transfer program aborts on the workstation.

[120]
After 120 seconds, the file transfer program aborts on the workstation.

[150]
After 150 seconds, the file transfer program aborts on the workstation.

[None]
When [None] is selected, the program waits indefinitely to be activated.

Host Program Name

When a Send or a Receive file transfer operation is started, the IBM host program IND$FILE MODULE is invoked from the workstation.

[IND$FILE]

[IND$FILE] is the default file transfer program. [IND$FILE] is the default option.

[Other]

[Other] is selected if another host file transfer program is used. When you select [Other], a text box displays, and you type in the new host file transfer program name in the text box. The new program must support the IND$FILE protocol.

Source File Name

Use this property to specify the name of the host file to be transferred to the workstation. The name must conform to the host environment's file naming rules (or syntax).

Host Environment

Allows you to specify the 3270 IBM host environment from which the files will be transferred. Three choices are available, each with unique options that appear on the properties sheet when each particular environment is selected.

[MVS/TSO]

Multiple Virtual Storage/Time Sharing Option. [MVS/TSO] is the default option.

[VS/CICS]

Virtual Storage/Customer Information Control System

[VM/CMS]

Virtual Machine/Conversational Monitor System

File Type

Identifies the type of [VM/CMS] file to be downloaded. This option is required and unique to the [VM/CMS] Receive file transfer operations and appears only when [VM/CMS] is selected on the property sheet. See Appendix J for CMS naming conventions.

File Mode

Identifies the file mode of the [VM/CMS] file to be downloaded. This choice is optional to the [VM/CMS] Receive file transfer operation and appears only when [VM/CMS] is selected on the properties sheet. The default value is [A1].

Note: See the *CMS User's Guide* for more details on the use of file types and file modes.

File Transfer Mode

Identifies the file transfer mode to be used, based on the contents of the file that is to be transferred to the workstation. For example, a file that consists of EBCDIC characters can be transferred to the workstation with transfer mode settings of [ASCII] or [VP Text], while a binary data file is transferred with a mode setting of [Transparent].

[ASCII]

Identifies the host file as being a standard EBCDIC text file. The host program translates EBCDIC characters into appropriate 7- or 8-bit ASCII character codes before sending the text to the workstation.

[Transparent]

Use for data files that reside on the host in a binary format (non-display form) for transfer to the workstation. No data translation is performed when this option is selected.

[VP Icon]

Use to download files from the host that

were originally sent to the host in [VP Icon] mode.

Use this option only with files that are sent to the host with a [VP Icon] transfer mode setting. Unpredictable results will occur if the file being downloaded to the workstation is not a ViewPoint icon file, or if the content of the file was changed while on the host.

[VP Text]
Use to transfer an EBCDIC text file on the host to a ViewPoint document on the workstation. When you select this option, the **Page Format** options appear. [VP Text] is the default option.

The host translates the EBCDIC characters into 7- or 8-bit ASCII character codes. Xerox Default Character Set 0 is compatible with the ASCII/ISO/CCITT character code standard, so no translating of the incoming text is required.

Units
Use to specify the measurement scale for the page format. Options available are [Inches], [Millimeters], [Centimeters], [Points], and [Spaces]. [Inches] is the default option.

Page Format
Use to select the document page size, based on the format of the host text file. The available options are defined as follows:

[8-1/2 X 11]
Standard U.S. business page size (portrait). [8-1/2 X 11] is the default option.

[11 X 8-1/2]
Landscape page size (horizontal)

[8-1/2 X 14]
Standard U.S. legal page size (portrait)

[14 X 8-1/2]
Landscape legal page size (horizontal)

[Other]
Use to specify a page size other than the available options. When you select this option, three additional options appear: [Units], [Width], and [Height]. Multinational page sizes can be entered in the width and height options.

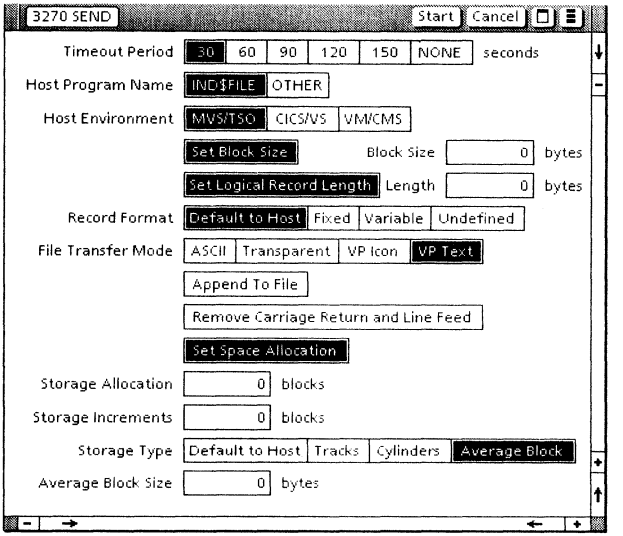
[Append Carriage Return and Line Feed]
Directs the host application to insert carriage return and line feed characters that separate records within a file. Displays only if the **File Transfer Mode** is [ASCII] or [VP Text]. The default for this option is off (not selected).

3270 Send option sheet

Use the 3270 Send option sheet (Figure 8-15) to set the Send transfer options. It appears when you select the auxiliary menu [Send] command in the 3270 Emulation window auxiliary menu. It contains the same options as the Send properties sheet, with the exception of the **Display** parameter.

Refer to the descriptions of the 3270 Send properties sheets later in this chapter for complete information pertaining to the 3270 Send options.

Figure 8-15 **Send option sheet TSO/VP Text/ Set Block/Set Logical Record**



3270 properties sheet with Send options displayed

The 3270 properties sheet displays when you select the 3270 icon and press <PROP'S>. Figures 8-16 through 8-21 show the [File Transfer Send] options that display on this properties sheet when 3270 file transfer is running.

When you select [File Transfer Send] in the 3270 properties sheet, the available file transfer Send options display. When the properties sheet opens for the first time, the file transfer Send options default to MVS/TSO options.

Added properties and options appear when different **Host Environment** options are chosen on the 3270 Send properties sheet.

You set the options based on the type of files you want to transfer and the host environment to which files will be transferred.

Figure 8-16 **Send properties sheet CICS/ASCII**

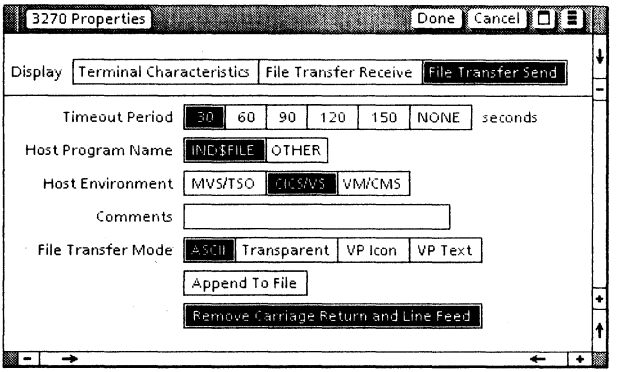


Figure 8-17 **Send properties sheet CMS/ Transparent**

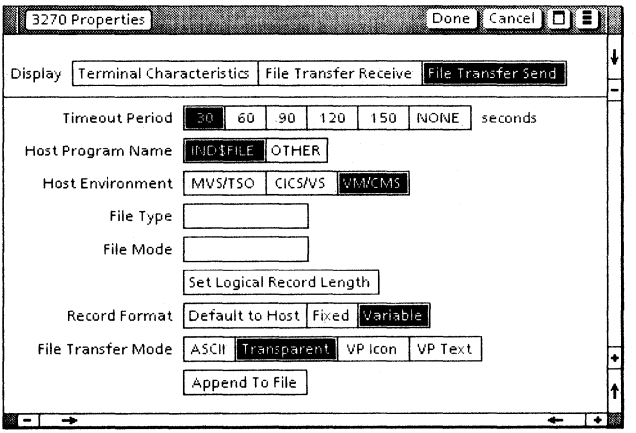


Figure 8-18 **Send properties sheet TSO/VP Text /Set Block Size/Set Logical Record**

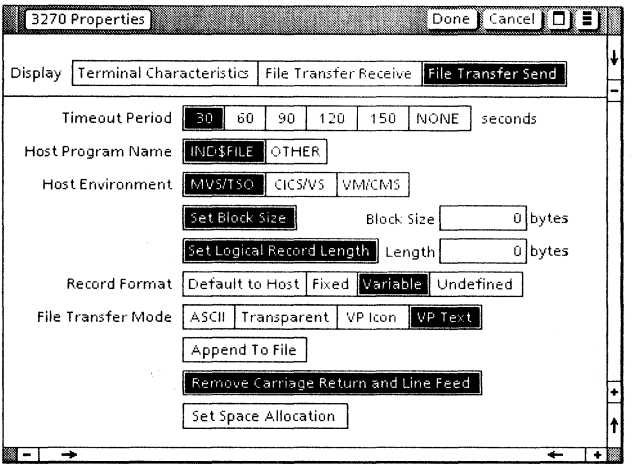


Figure 8-19 **Send properties sheet TSO/Default to Host/VP Icon**

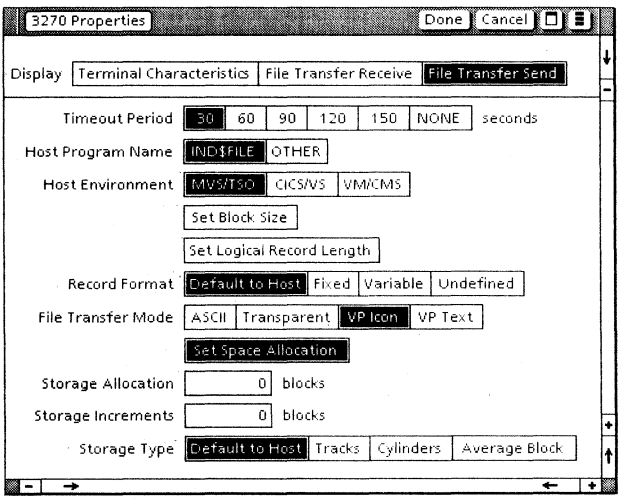


Figure 8-20 **Send properties sheet TSO/ Transparent/Append To File**

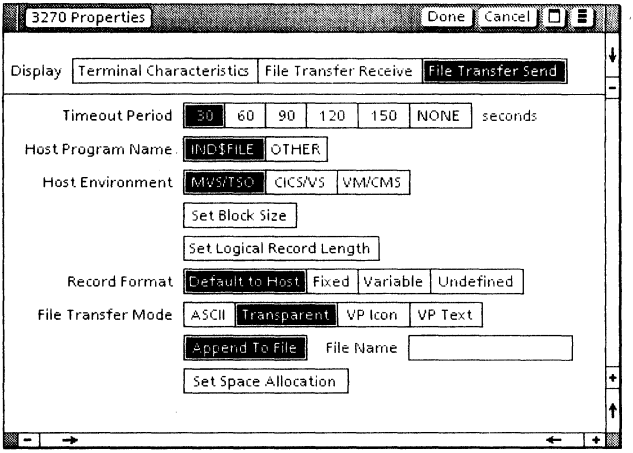
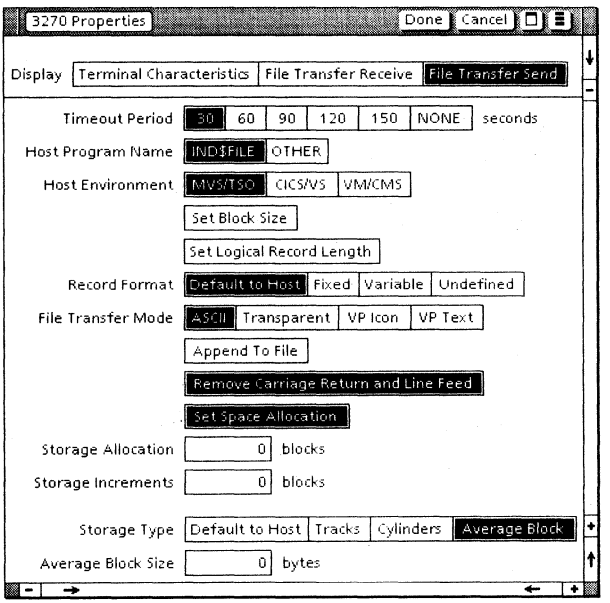


Figure 8-21 **Send properties sheet TSO/ASCII/ Set Space Allocation**



Step by step instructions for setting the Send properties for each host environment are provided in the *VP IBM 3270 File Transfer Training* guide.

Properties and options

The following is a list of the properties and options available when you select [File Transfer Send] as the **Display** option on the 3270 properties sheet:

Timeout Period

Allows you to set the time frame in which the host must respond when a file transfer request is issued. If the host does not respond within the designated time period, the file transfer application issues one last request to start the transfer before aborting the operation.

[30]
After 30 seconds, the file transfer program aborts on the workstation. [30] is the default option.

[60]
After 60 seconds, the file transfer program aborts on the workstation.

[90]
After 90 seconds, the file transfer program aborts on the workstation.

[120]
After 120 seconds, the file transfer program aborts on the workstation.

[150]
After 150 seconds, the file transfer program aborts on the workstation.

[None]
When [None] is selected, the program waits indefinitely to be activated.

Host Program Name

When a Send or a Receive file transfer operation is started, the IBM host program IND$FILE MODULE is invoked from the workstation.

[IND$FILE]

[IND$FILE] is the default file transfer program. [IND$FILE] is the default option.

[Other]

[Other] is selected if another host file transfer program is used. When you select [Other], a text box displays, and you type in the new host file transfer program name in the text box. The new program must support the IND$FILE protocol.

Host Environment

Allows you to specify the host environment to which the files will be transferred. Three choices are available, each with unique options that appear on the property sheet when each particular environment is selected.

[MVS/TSO]

Multiple Virtual Storage/Time Sharing Option. [MVS/TSO] is the default option.

[VS/CICS]

Virtual Storage/Customer Information Control System

[VM/CMS]

Virtual Machine/Conversational Monitor System

File Type

Identifies the type of [VM/CMS] file to be uploaded. This option is required and unique to [VM/CMS] file transfer operations and appears only when [VM/CMS] is selected on

the properties sheet. (See Appendix J for CMS naming conventions.)

File Mode

Identifies the file mode of the [VM/CMS] file to be uploaded. This choice is optional to the [VM/CMS] Send file transfer operation and appears only when [VM/CMS] is selected on the properties sheet. The default value is [A1].

The file mode letter specifies the virtual disk on which the file will reside. The file mode number is from 0 to 6, which is assigned to a newly created file.

Note: See the *CMS User's Guide* for more details on the use of file types and file modes.

Comments

Use to add notes to the first record of a file. You can enter a maximum of 24 characters. This choice is optional and appears when the **Host Environment** [CICS/VS] option is selected.

[Set Block Size]

Use to change the logical record length of a file. When you select this option, a [Block Size] option appears so you can enter the number of bytes for the block size. If you do not select [Set Block Size], the host default value is used.

[Set Logical Record Length]

Defines the logical record length of a file. When you select this option, a [Length] choice appears so you can enter the number of bytes in each record.

When you send a text file that consists of variable line lengths, the maximum size or the longest length of a record should be entered. When you do not select this option, the logical record

length of the new file will default to an 80-character record length.

Files being replaced default to the maximum record length of the existing file. This option appears when you select the **Host Environment** [MVS/TSO] or [VM/CMS].

Record Format

Use to define the record type of a file. The **Record Format** options appear when you select the **Host Environment** [MVS/TSO] or [VM/CMS]. Record formats are defined as follows:

[Default to Host]

Specifies that the host defined record format is to be used. [Default to Host] is the default option.

[Fixed]

Specifies a data set containing fixed-length records.

[Variable]

Specifies a variable-length record.

[Undefined]

Specifies that the record length of a file is not defined. This option only appears under [MVS/TSO].

A newly created file on the host defaults to a fixed record length, unless the [Remove Carriage Return and Line Feed] option is also selected. A variable length record format is assumed by the host when the [Remove Carriage Return and Line Feed] option is also selected.

File Transfer Mode

Identifies the file transfer mode to be used based on the type of icon or icons you select for transfer.

Not all icons can be transferred under all of the transfer mode settings. For example, ViewPoint documents should only be transferred with mode settings of [VP Text] or [VP Icon], while 860 documents can only be transferred with a transfer mode setting of [Transparent] or [VP Icon].

Unpredictable results will occur if the appropriate transfer mode option is not selected.

[ASCII]

Use to transfer text files that consist of standard 7- or 8-bit ASCII character codes. When it receives the file, the host translates the ASCII text into the appropriate EBCDIC character codes.

The [ASCII] option should only be used with ASCII text files. Examples of ASCII files are WordStar text files, MicroSoft Word text files, and IBM DisplayWrite text files.

[Transparent]

Use to transfer binary files to the host. No EBCDIC character translation will take place. Only the content of the file will be sent while the icon properties and filing structures are ignored.

You should use this option only when sending non-ViewPoint objects. Examples of non-ViewPoint objects are WordStar text files and MS-DOS programs and spreadsheets.

[VP Icon]

To take advantage of the immense storage facility of an IBM host, use the [VP Icon] option to transfer ViewPoint icon objects to the host without the loss of ViewPoint icon properties.

To ensure that the properties of a ViewPoint icon and its content are

retained, the system converts the icon and all its contained icons into a special format before transferring to the host.

The transferred file that resides on the host must not be altered in any way. Changing the contents of the file on the host will destroy critical components in the file and cause unpredictable results when the file is transferred back to the workstation.

[VP Text]
Use to transfer text from a ViewPoint document to an EBCDIC file on the 3270 host. [VP Text] is the default option.

The Xerox Default Character Set 0 is compatible with the ASCII/ISO/CCITT character code set. No translation of character codes is performed at the workstation. Those characters that are not in the default character set are translated into hyphens.

Document structures, such as graphic frames, tables, and CUSP buttons, are filtered out. New line and new paragraph characters translate into a 2-byte character sequence consisting of a carriage return character followed by a line feed character.

The following ViewPoint document format properties are lost: character font properties, margin settings, tab settings, and page format properties. Once the document is transferred to the host, minor editing may be required.

See Appendix G for the translation of ViewPoint format characters to EBCDIC format character code.

[Append To File]
Use to append a file to the end of an

existing file on the host. When you select this option, the [File Name] text box displays so you can enter the name of the file that will be expanded with the appended file. This option will not display when the **File Transfer Mode** option [VP Icon] is selected. The default for this option is off (not selected).

[Remove Carriage Return and Line Feed]
When you select this option, the host application will delete carriage return and line feed characters that separate lines within a file. The host uses carriage return and line feed characters to identify record boundaries. The default for this option is off (not selected).

The host assumes variable-length records when you select the [Remove Carriage Return and Line Feed] option. This option displays only if the **File Transfer Mode** option you select is [ASCII] or [VP Text]. It will not display when you select the **File Transfer Mode** option [VP Icon].

[Set Space Allocation]
Use to set the storage configuration for the creation of a new file in an MVS/TSO environment. When you select this option, the following properties display:

Storage Allocation
Storage Increments
Storage Type

When this option is not selected, the host default [Storage Allocation] options are used upon creation of a new file. The default for this option is off (not selected).

Storage Allocation
Tells the host the amount of storage to allocate when creating a new file. When this

option displays, a text box appears and you type new numeric values in the text box. **Storage allocation** is measured in blocks.

Storage Increments

Specifies the amount of additional storage that is to be allocated once the initial storage allocation has been exceeded.

The **Storage Increments** option can only be specified if an entry has been made in the **Storage Allocation** option. When this option appears, a text box is displayed and new numeric values are typed in the text box. **Storage increments** are measured in blocks.

Storage Type

Identifies the type of storage to be used for a file. If you select the [Average Block] option, an **Average Block Size** option displays, and you enter the average size of a data block.

Average Block Size

Use to enter the average size of a data block. Data blocks are measured in bytes.

Retrieving a 3270 emulator icon for file transfer

Emulator icons represent pathways to specific host computers. They are copied from the IBM 3270 Emulators divider in the directory.

VP Terminal Emulation of IBM 3270 and *VP IBM 3270 File Transfer* applications must be loaded, running, and enabled before a 3270 icon can be retrieved for file transfer.

The number of emulator icons that appear within a 3270 icon divider depends on the number of host computers registered in the Clearinghouse Service for that domain.

Delete any IBM 3270 icons currently on the desktop, and retrieve a new IBM 3270 icon.

1. Open the Directory icon, the Network divider, the appropriate organization divider, and the appropriate domain divider.
2. Open the IBM 3270 Emulators divider.
3. Copy the desired 3270 icon to the desktop. The pointer changes into a miniature emulator icon until a location is selected on the desktop.

Note: The name of each icon is initially set by the *System Administrator.* The 3270 icon on the desktop can be renamed using the properties sheet.

Setting properties for a 3270 emulator icon for file transfer

The 3270 emulator icon has properties and option sheets that can be changed to fit individual needs. You can use these sheets to set a 3270 emulation property, such as the terminal address, each time an emulation session is started. You must set these parameters before any connection is made.

Selections made in properties sheets are permanent until the settings are changed; whereas, selections made in option sheets override the property settings and are maintained only for the current session.

1. Select the 3270 icon and press <PROP'S>. The 3270 Emulation properties sheet appears.

2. If desired, select [Display Options] so the option sheet appears each time the emulator icon is opened. [Display Options], is the default setting.

   Note: If [Display Options] is not selected, the 3270 option sheet does not appear when the icon is opened; the properties set on the 3270 option sheet are used in the emulation session.

3. Select the desired terminal address from the choices displayed. If the choice is already in use, a message is displayed. If the address is not important, select [Any] and the first available address will be assigned.

4. Select [Done] in the window menu to close the properties sheet and store any changes you made, or select [Cancel] to close the properties sheet without storing the changes.

Naming ViewPoint icons for file transfer

To name a file for transfer, follow the naming conventions described for each host environment.

1. Select the ViewPoint icon and press <PROP'S>.
2. Type in the desired host's string file name syntax. Refer to Appendix J for more details on host file naming conventions.

Starting an emulation session for file transfer

An emulation session begins when a connection with the desired host computer is established. Once a connection is made, the 3270 icon expands into an emulation window.

1. Select and open the 3270 icon.
2. Fill in the option sheet and select [Start]. Change options or add information as desired. (These changes are effective only for the duration of the session.) Relevant information can be supplied by the System Administrator.
3. Select inside the emulation window.
4. Log on by entering the following information: name, password, or any other information necessary to start the session. This type of information can be supplied by your System Administrator.

Starting a file transfer Receive operation

1. Holding down the left mouse button, select the 3270 window auxiliary menu and highlight the [Receive] command. Release the mouse button. The Receive option sheet appears.

2. Enter the name of the file slated for transfer to the workstation in the **Source File Name** box, and set the appropriate options based on the type of file specified.

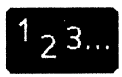
   Note: If the file name is currently displayed in your 3270 emulator window, it is convenient and accurate to copy it into the Receive option sheet.

3. Select [Start] in the option sheet. The Receive option sheet closes, and the "Initiating a file transfer request for the file xxxxx" message appears in the 3270 window. Once the IND$FILE MODULE program starts on the host, the file transfer operation begins.

   See the System messages in the *QuickFind Reference* volume for more information on ViewPoint status messages.

A beep will sound to notify you of the completion of the file transfer, and the **Download to Host** status indicator disappears from the 3270 icon window.

Starting a file transfer Send operation



After starting the emulation session and logging on, you are ready to start a file transfer.

1. Select the file(s) to be transferred.

Note: Check the name of the file to see if it conforms to the host file naming conventions. Refer to Appendix J for detailed information on naming conventions for each host environment.

2. Hold down the left mouse button, select the 3270 window auxiliary menu, and highlight the [Send] command. Release the mouse button. The Send option sheet appears.

3. Set the desired parameters in the option sheet, based on the type of files selected for transfer.

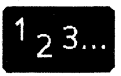
4. Select [Start] on the option sheet. The option sheet closes and the "Initiating a file transfer request for the file xxxxx" command displays in the 3270 window. Once the IND$FILE MODULE program starts on the host, the file transfer operation begins.

Note: Icons being transferred (busy) should not be manipulated (opened or edited) during the transfer.

A beep will sound to notify you of the completion of the file transfer, and the **Upload to Host** status indicator disappears from the 3270 icon window.

After transferring a ViewPoint icon to the host, verify the transfer by transferring the file back to the workstation. If the result of the transfer does not produce an icon, then delete the file on the host and transfer the icon again.

Appending text files on the host



When a file is transferred to the host, it will write over a file of the same name that already exists on the host.

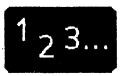
If you want to add the file to the end of an existing file on the host, use the [Append to File] option. The file(s) to be appended must be of the same type. For example, you would not append an ASCII file to a binary data file.

Note: This option is not available for use with the [VP Icon] file mode.

1. Select the ViewPoint text icon to be appended to the host file.
2. Select [Send] in the 3270 auxiliary menu.
3. Select [Append To File]. The [File Name] text box displays.
4. Type the file name of the host's file in the [File Name] text box.
5. Select [Remove Carriage Return and Line Feed].
6. Select [Start].

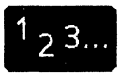
This option appears only when you send files.

Ending an emulation session



Closing the emulator window alone does not automatically log you off the host computer. Log off the host computer, before you select [Close] at the top of the emulation window.

Terminating a file transfer



During a file transfer operation, the desktop may be used for other activities, including other 3270 emulation sessions. These sessions can also include a file transfer operation.

All keyboard input inside the 3270 icon window is ignored during a file transfer operation, with the exception of the <STOP> key.

1. Select within the 3270 window.

2. Press the <STOP> key. A status message displays in the 3270 window at the completion of the terminating operation.

   If the file transfer does not fully terminate and is in an unknown state, press <PF2> followed by <ENTER>. This action cancels the operation at the host. See the System messages in the *QuickFind Reference* volume for more information on ViewPoint status messages.

Part 3

The Remote Batch Service

9. Overview of the Remote Batch Service

The *Remote Batch Service* (RBS) transfers files between a Xerox Network Systems (XNS) file service and a remote binary synchronous (BSC) device. The RBS provides data format conversion when required.

One of the services the RBS performs is to send information created on a Xerox workstation (such as a 6085 Professional Computer System or an 8010 Information System) to a host or non-Xerox workstation for processing or archiving. For example, you can store monthly reports on a host, retrieve them once a year to assist in the creation of an end-of-year report, and then return the reports to the host to be archived.

The RBS also lets you retrieve information created on a host computer or non-Xerox workstation to Xerox workstations for enhancement or integration into other documents.

Additionally, the RBS enables you to simply exchange documents between your workstation and another device without altering the contents of the document.

Four devices are involved in the RBS process of document interchange:

- The network server running the RBS
- The network server running the File Service
- The partner (described later in this chapter)
- The workstation

These four devices can be separated geographically, with the workstation, File Service, and the RBS on separate networks, as long as the networks are part of the same internetwork.

However for better performance, the File Service and the RBS should be on the same network, preferably on the same server.

A single RBS can support multiple partners, although it can communicate with only one partner at a time.

The RBS and all of the partners with which it communicates are available to all workstations on an internetwork.

Chapter organization

"The Remote Batch Service" consists of two chapters.

- Chapter 9, "Overview of the Remote Batch Service," describes the RBS and its key elements.
- Chapter 10, "Using the Remote Batch Service," tells you how to create a task folder and provides examples of how to send and archive documents.

Key concepts of the Remote Batch Service

Three key elements are involved in using the *Remote Batch Service* (RBS):

- The partner
- The task folder
- The document transfer process

The RBS provides document (or data file) transfer between Xerox network devices and a *partner*. The partner is usually an IBM host, an IBM Model 5520 Administrative System, or a non-Xerox workstation.

To transfer a document to the partner, you first prepare a *task folder.* In the task folder, you place your document to be transferred and instructions for the RBS.

After you prepare the task folder, you place it in an input file drawer. The System Administrator assigns each partner its own file drawer, which the RBS periodically polls for tasks.

Your task folder remains in the input file drawer until the RBS copies it from the file drawer. The RBS then interprets the instructions, converts the format of the document or data file to be transferred (if necessary), and transmits the data to the partner via a phone line or a direct (null modem) connection.

When the RBS transfers documents, it can either translate between 860 and EBCDIC document formats or transfer documents without format changes. The RBS can also serialize Xerox files to archive on a host and deserialize files that have been archived. These document interchange options are controlled both by the System Administrator, who must set up the RBS to support these options, and by an instructions document that you create.

If configured to do so by the System Administrator, the RBS converts EBCDIC files to the 860 format or deserializes Xerox files that have been archived. The RBS places all files it receives from its partner into an output file drawer.

The partner

The *partner* can be any of a number of devices that implement the IBM Binary Synchronous Communications (BSC) protocol. Most commonly, the partner is an IBM host computer, an IBM Model 5520 Administrative System, an IBM word processing (WP) device, or software that emulates one of these devices.

This document uses the term "WP devices" to mean word processors, personal computers, and other intelligent communicating workstations that use the BSC protocol. The Xerox 860 word processor is an example of a WP device that can function as a partner of the RBS.

This manual always uses the term "partner" to mean the host, 5520, or WP device at the other end of the document transfer, but not any devices in between.

The RBS emulates an IBM 2770, 2780, or 3780 Remote Job Entry Terminal and appears as one of these to the partner. It does this by using the 2770, 2780, or 3780 variant of the BSC protocol. The System Administrator specifies which protocol variant RBS will use.

If the partner is a host, it either stores or processes the task sent by the RBS, as instructed in the instructions document.

The host recognizes either WP EBCDIC or DP EBCDIC files. It needs Job Control Language (JCL) instructions to perform the task requested by the RBS.

The RBS communicates with partners over a telephone line or through a direct connection that uses a synchronous modem eliminator or limited distance modem.

Task folder

Each request to the RBS, regardless of the type, is called a *task* and consists of a task folder. This folder contains an instructions document (to guide the RBS in converting and transmitting the data) and the actual data (documents, files, and folders). If the task is going to a host that requires JCL instructions, the folder must also include a JCL document.

Before sending, archiving, or retrieving files to or from a partner, you prepare a task folder at your

workstation. The folder contains one or more files, plus a document titled "Instructions." The instructions document title can include an extension, for example:

Instructions MonthlyReport

The instructions document specifies the order of transmission of each file in the task folder, plus any conversions that may be necessary for that file. You must convert the instructions document to 860 format. Converting documents to 860 format is described in the next chapter.

If you include a JCL document, you must also convert this document to 860 format.

Additionally, any documents you want the RBS to convert to EBCDIC must be submitted in 860 format.

Once you create the task folder, you place it in an input file drawer set up by your System Administrator.

The RBS processes tasks by periodically copying task folders from the input file drawer, interpreting the instructions document in each task folder, and performing any conversions necessary before sending the tasks to the partner. If an error occurs during task submission, the RBS copies the task folder to an error folder in the input file drawer. It then mails an error summary note to the person who submitted the task. Tasks successfully submitted are deleted from the input file drawer.

Types of tasks

You can submit three types of tasks to the RBS:

- Interpreted document transfer
- Uninterpreted document transfer
- Document archiving

Regardless of type, these tasks consist of a task folder as described in the preceding section. The three task types are described below.

Interpreted document transfer

The RBS interprets only the Xerox 860 document format and code set. During interpreted document transfer, the RBS converts a document from 860 format to the appropriate format (WP EBCDIC or DP EBCDIC) for the partner device, and then transmits the data to the partner.

For interpreted document transfer, if the partner transmits data back to the RBS, the RBS converts the data into 860 format. This conversion allows XNS networked devices that can use 860 format to retrieve the data.

Devices that use the 860 format include the following:

- An 820-II Personal Computer
- An 860 word processor
- A 6085 or 8010 workstation
- A Memorywriter

The RBS can convert documents between 860 format and the IBM 2770/3780 EBCDIC DP code set, the IBM 2770/3780 EBCDIC WP code set, and the IBM 2780 EBCDIC code set.

Interpreted document transfer supports the multinational variants of EBCDIC WP and EBCDIC DP.

Uninterpreted document transfer

The RBS can exchange documents with devices without changing the document's format. This exchange is called "uninterpreted document transfer." For example, you can move a file from a PC that handles ASCII documents to your workstation by sending the file from the partner (in this case, the PC) to the File Service through the RBS. To transfer this file, or any document

that has formats and structures unknown to any intermediary, the RBS uses BSC Transparent Mode.

Document archiving

The RBS enables you to send Xerox Network System files and folders to a host and to retrieve them at a later date. In this way, the RBS lets you take advantage of the ability of large host computers to provide cost-effective file storage and archival facilities.

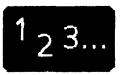
When you submit a document archiving task, the RBS serializes the document (a file or folder) and sends it to a host for archiving. The RBS does not alter the contents of the files or folders. Thus, they retain all information and structure (for example, graphics, fonts, tabs, and paragraph spacing) as well as attributes (such as the name of the file or folder, its type, and its size) in storage.

When the RBS receives an archived document, it deserializes the data to restore it to its original form before placing it in the output file drawer.

10. Using the Remote Batch Service

You can create tasks for the *Remote Batch Service* (RBS) on any workstation that can access the File Service. These workstations include the 6085 Professional Computer System, the 8010 Information System, the 860 Information Processing System, the 820-II Personal Computer, and the IBM Personal Computer.

Using the Remote Batch Service from a 6085 or 8010 workstation



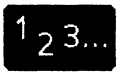
Using the RBS from a 6085 or 8010 workstation is straightforward: You create the instructions document and the JCL document, if needed, convert them to 860 format, place them in a task folder with the data files, and place the folder in the input file drawer assigned to the intended partner.

If the task requires data to be returned from the partner, the RBS places the returned data in the output file drawer assigned to that partner. You can then retrieve the output from the file drawer and convert the documents back to ViewPoint format, if you wish, so that they can be edited, revised, or viewed on your workstation. You convert the document by copying it onto the 860 Document Converter icon. (See the section titled "Converting documents to 860 format" in this chapter for information on file conversion.)

Note: It is recommended that you use a fixed pitch font in files you send to be processed by a host. Otherwise, you will lose your proportional spacing in the output file. Adjust the margins of

the original document so that the resulting line length is 80 characters or less.

Using the Remote Batch Service from other devices



On workstations other than the 6085 and 8010 (such as the 820-II, 860, or IBM PC), the procedure for creating a task folder is complicated by the fact that the folder must be in ViewPoint format. You create the individual documents (instructions document, JCL document, and individual files) on your workstation.

If you use an 860, you create the task folder in the input file drawer from your workstation. To create a folder in a remote file drawer, refer to the *Ethernet/860 IPS Interface* manual.

If you use an 820 or a PC, your System Administrator must create an empty folder for you in the input file drawer.

Once an empty task folder is placed in the input file drawer, you can move or copy the individual files into it. Make sure to place the instructions document last.

The instructions document is always last, because the RBS can start processing the task immediately after the instructions document is placed in the task folder. Any data files that are not in the folder when the RBS begins the task will not be processed, and you will need to resubmit the task.

You can retrieve the output from the output file drawer to the workstation, where it can be enhanced with graphics and formatting, mailed, printed, or integrated into other documents. The output appears in the output file drawer as individual files.

For document archiving, the output files retain their original names. For other kinds of file transfer, either the RBS provides a default file name, or you can specify a name for the output files. For details see the section titled "The output file name" later in this chapter.

To use the RBS from a networked personal computer, you use the XFile application to store and retrieve your files. From a non-networked PC, you need to run a terminal emulation program from which you can communicate with the *Interactive Terminal Service* (ITS). You must understand both your terminal emulation software and the ITS to communicate with the RBS in this manner.

Creating a task folder

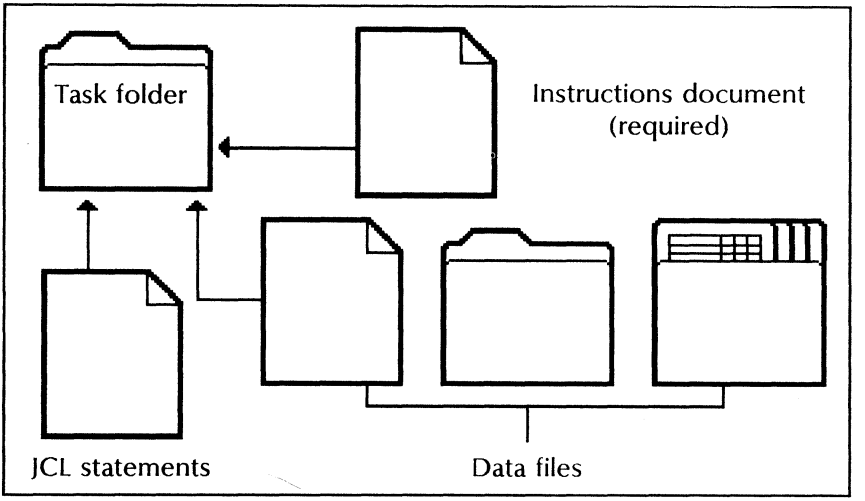
A task folder must be created for each transaction, regardless of the type of interchange desired.

Figure 10-1 shows the kinds of documents that can make up a task folder.

To create a task folder on a ViewPoint (6085 or 8010) workstation:

1. Copy and rename a blank folder. The folder can have any name permissible in ViewPoint.
2. If you have data files that you want the RBS to convert to EBCDIC, you first convert them to 860 format.
3. Place data files in the folder.
4. If the task requires JCL instructions, write them in a ViewPoint document, convert the document to 860 format, and place it in the folder. (See "Preparing the JCL document" later in this chapter.)

Figure 10-1 **Task folder documents**



5. Prepare an instructions document, convert it to 860 format, and place it in the folder. Preparing an instructions document is described in the following section.

   Note: To convert the JCL statement and instruction document to 860 format, see the section titled "Converting documents to 860 format" in this chapter.

To create a folder on a non-ViewPoint workstation, see the preceding section titled "Using the Remote Batch Service from other devices." If you use an 860 word processor, you will not need to convert documents to 860 format.

The instructions document

Files are transmitted according to their order of appearance in the instructions document, not their order of appearance in the task folder.

You can include comment lines in your instructions document by preceding each line with two slashes and an asterisk (//*), for example:

//*Updates April Stats

The RBS ignores comment lines when it processes the instructions document.

Naming the instructions document

The instructions document must be labeled "Instructions." This label can include an optional file-name extension:

Instructions[extension]

Note: The square brackets indicate the extension is optional. Do not include them when you type the label.

The extension can be appended either with no separator or with any separator permitted in ViewPoint. The following examples illustrate some of the ways to append a file-name extension:

- InstructionsDocument
- Instructions Janet
- Instructions.JVW
- Instructions__for__Rods__doc

Instruction statements

An instructions document contains *instruction statements*. Their form (or *syntax*) must follow certain rules: The statements contain a destination format (described in the next section), followed by a colon and the name of the document (or folder or data file) being transferred.

The name of the document is the name that appears on its property sheet.

Instruction-statement syntax is summarized by the following line:

Destination Format:Document Name

The following is an example of an instruction statement written in this syntax:

WP:Quarterly Review

Destination format

In an instruction statement, the destination format is the format of the file the RBS will send to the partner.

Destination formats include the following:

DP
Data processing format; used for interpreted document transfer (described in the previous chapter). The RBS assumes the file is in 860 format and converts it to EBCDIC DP. You must specify DP as the destination format for all JCL documents.

WP
Word processing format; used for interpreted document transfer. The RBS assumes the file is in 860 format and converts it to EBCDIC WP.

XNS
Network Systems (NS) serialized file format; used for archiving ViewPoint or 860 format documents to a host without changing format, file attributes, or structure. The RBS serializes the file before sending it to the host.

Foreign
Unaltered file format; used for uninterpreted document transfer (described in the previous chapter) to a partner without changing format. Only the contents of the file are

sent. All NS filing attributes kept with the file are lost.

Guidelines for preparing an instruction statement

The following are general guidelines for preparing an instruction statement:

- A destination format must be specified.
- Except where spaces exist in the document name, spaces in an instruction statement are not allowed.
- The document name in the instruction statement must exactly match the name on the document's property sheet, character-for-character.
- One instruction statement must be written for each top-level file (document, folder, or data file) within a task folder.
- The name of each top-level file within the task folder must be unique.
- Instruction statements must be separated from each other by a new paragraph or new line character.
- The last instruction statement should be followed by a new paragraph character.

Preparing the instructions document

To prepare the instructions document:

1. Copy a blank document.
2. On its property sheet, change its name to "Instructions[extension]."
3. Open the instructions document.
4. If necessary, select [Edit] in the window header.

5. Type the instructions statements, ending the last statement with a carriage return.

6. Close the document.

The output file name

The file that the RBS places in the output file drawer after it is finished processing the file is called the *output* file. This file gets named in one of two ways: Either the RBS assigns a default name or you specify the name of the output file.

Specifying the output file name

You can specify the name of the output file in the first line of the document you are sending to the partner (not the instructions document).

The RBS looks for the file name within the first 100 lines of the document it receives from the partner (the output file). Therefore, the file name can also be specified as a comment line in the JCL document, provided that the host lists the JCL statements in the beginning of the output file.

The file name in a JCL comment line is preceded by two slashes and an asterisk (//*) and must appear within the first 100 lines of the JCL document.

Note: If the host places the JCL statements at the end of the output file, the file name might not fall within the first 100 lines of the output file. Therefore, the beginning of the document being sent is the best place for the output file name.

The output file name has the following syntax:

RBSReceivedFilename:(n)<Filename>

where **n** represents the number of characters in the file name, and **<Filename>** represents the

name. The number of characters (**n**) is in decimal notation and must be less than 100.

The key word **RBSReceivedFilename** is not case sensitive: You can type it in uppercase or lowercase characters, or a combination of both.

For example, if you are sending the file "May Figures" and you want the output file also to be called "May Figures," the first line in the May Figures file should be the following:

RBSReceivedFilename:(11)May Figures

Note: There must not be a right parenthesis in the text preceding the output file name line, or the RBS will not accept the file name.

If the line is included in a JCL document, instead of in the data file, the line should read:

//*RBSReceivedFilename:(11)May Figures

When you retrieve your file from the output file drawer, the icon will be labeled "May Figures".

The default output file name

If you do not specify the output file name, the RBS provides a default name, which consists of a time stamp, the destination format within parentheses, and the name of the partner. For example:

1200(DP)OBShost

If the resulting file name would be over 20 characters long, only the first 20 characters are used for the file name.

Preparing the JCL document

If the partner is a host computer that requires JCL instructions, you will include a JCL document, containing JCL statements, in your task folder. Your JCL document should contain one card image to a line. You will need multiple JCL files if your data needs to occur between JCL statements in the job.

For information about writing JCL statements, refer to the IBM publications describing Job Control Language and consult the System Administrator of the host computer.

Unlike the instructions document, which must be called "Instructions", the JCL document does not require a specific name.

You list the JCL document in your instructions document as having a DP destination format, for example:

DP:JCL Archive

The instructions document specifies the order of the JCL and data files in the job.

Converting documents to 860 format

The RBS cannot read instructions written in ViewPoint format; therefore, the instructions document and the JCL statements must be converted to 860 format before they are placed in the task folder to be submitted to the partner.

To convert a document to 860 format:

1. First make sure that *VP File Conversion of 860 Documents* is running in your application loader.

2. Retrieve a Converter icon from the Office Accessories divider, which is located in the Workstation divider of the Directory.

3. Copy the document icon to the converter icon.

4. When the Converter options sheet displays, select [None] as the **Destination Suffix**.

   Note: To ensure that name of the converted instructions document is "Instructions," [None] must be selected.

5. Select [860 Document] as the **Destination** format.

6. Select [Start] on the option sheet. The newly converted icon appears on the desktop as close as possible to the source icon.

To convert 860 documents retrieved from the output file drawer back to ViewPoint format, use the above procedure but select [VP Document] as the **Destination** format.

Input and output file drawers

The System Administrator designates which file drawers are used in conjunction with the *Remote Batch Service* (RBS). Contact your System Administrator for file drawer names and locations.

Each file drawer is created for a specific partner. The input and output file drawers for a given partner will be on the same network server.

Using input file drawers

You place a completed task folder in the input file drawer, where the RBS finds and processes it. First, copy the input file drawer icon to your desktop; then move or copy the task folder onto the input file drawer icon.

If you made an error in assembling your task folder, the folder is automatically moved to an error folder contained in the input file drawer. If

the Mail Service is available, you also receive a mail note indicating that the task folder was not processed.

If you do not have the Mail Service available, you can verify that your task has completed correctly by checking the error folder. If you find your task in the error folder, retrieve it and make the necessary changes before resubmitting it to the RBS.

Depending on the type of connection that exists between the RBS and the partner, tasks placed in the input file drawer may not be sent to the partner until the System Administrator starts an RBS session. The RBS might require operator assistance during startup, if more than one communication partner has been defined and no default has been specified.

Using output file drawers

When the RBS receives output from a partner, it converts the output to the appropriate format (if necessary) and places it in the output file drawer. Once a file is placed in the output file drawer, you can retrieve it, convert it to ViewPoint format, if applicable, and then manipulate it in the same manner as any other document.

If the file placed in the output file drawer was originally sent to the partner in XNS (archive) format, no conversion is necessary, because the file's name, structure, and attributes are preserved.

If a file placed in the output file drawer is received in EBCDIC format, the RBS may convert the file to 860 format, if the System Administrator has configured it to do so.

Examples

This section describes examples of interpreted file transfer, archiving, and uninterpreted file transfer.

Interpreted document transfer

Example 1: Send a document named "January - June Stats" to a partner that requires JCL instructions.

The contents of the task folder are as follows:

Source format	Name of file
860 document	Instructions
860 document	JCL program 32
860 document	January - May Stats

The instruction statements in the instructions document are as follows:

DP:JCL program 32
WP:January - May Stats

Example 2: Send a document named "January - June Stats" to a partner that does not require JCL instructions or to a WP device.

The contents of the task folder are as follows:

Source format	Name of file
860 document	Instructions
860 document	January - May Stats

The instruction statement in the instructions document is as follows:

WP:January - May Stats

Uninterpreted document transfer

Example: Send a document named "Marketing Info 1988" in Xerox format to a partner that does not require JCL instructions.

The contents of the task folder are as follows:

Source format	Name of file
860 document	Instructions
ViewPoint folder	Marketing Info 1988

The instruction statement in the instructions document is written as follows:

Foreign:Marketing Info 1988

Archiving

Example: Store or archive a document named "Marketing Info 1988" in Xerox format on a partner that requires JCL instructions.

The contents of the task folder are as follows:

Source format	Name of file
860 document	Instructions
860 document	JCL archive program
ViewPoint folder	Marketing Info 1988

The instruction statements in the instructions document are as follows:

DP:JCL archive program
XNS:Marketing Info 1988

Note: Archiving to a non-host device is generally not cost-effective.

Part 4

VP Data Capture

11. Overview of VP Data Capture

VP Data Capture transforms document data into a formatted table. The data can come from an emulation session or any other source, as long as two conditions are satisfied:

- The data is arranged in a consistent pattern.
- The data currently resides in a ViewPoint document.

Data Capture capabilities

This application allows you to specify which data is to be copied into a table. You do this by describing the location and characteristics of the data to be captured. Data Capture then creates a new document containing a table of the data you specified.

Not only can you use Data Capture to convert textual data to table form, you can use Mail Merge to convert table data into text (the reverse of Data Capture). Refer to the *Document Editor Reference* volume 4 for information about tables and Mail Merge.

Data Capture is often used to convert terminal emulation data into tabular form, although you can use Data Capture for almost any data you wish to put into a table, provided the two conditions stated at the beginning of this chapter are met.

Emulation data

You create a document from a terminal emulation session by using the [Make Document] or [Make Screen] command.

The resulting document of emulation data is not always easy to read, nor is it always readily usable by other ViewPoint applications. However, once the data has been captured in a table, it is presentable, and you can sort it, style it, and generate charts from it.

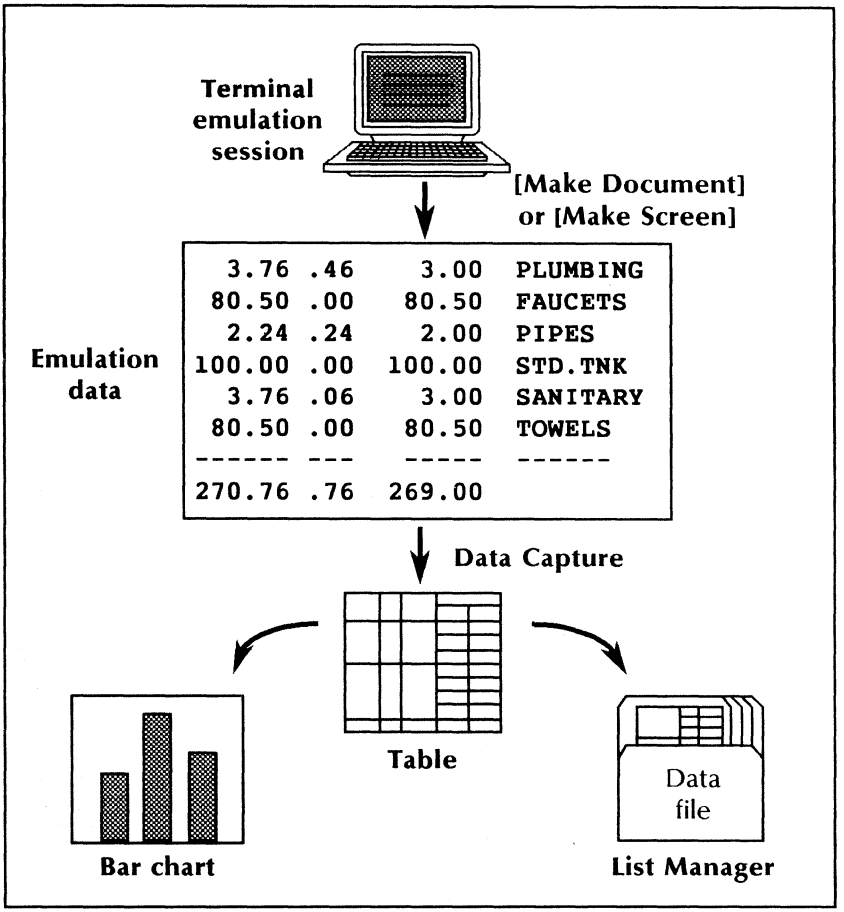
Data Capture is the bridge between:

- ViewPoint's ability to retrieve data from a remote host, and
- ViewPoint's ability to display and manipulate data

The Data Capture application is particularly useful when your data base is maintained on a host computer, and you must take periodic snapshots of the data to manipulate at your workstation. In fact, once you have written a description of the data to be captured, you can keep reusing the same description, thereby reducing subsequent captures of the data to a few simple steps.

Figure 11-1 illustrates a possible flow of data from terminal emulation to either a chart or List Manager file.

Figure 11-1 **Emulation data flow**



Other sources of data

If you are entering new data into a document using the keyboard, and you want the data in a table, it is easiest to enter it directly into the table yourself. If you have data you retrieved from another type of workstation, or data that you

originally stored in straight-text form, use Data Capture to convert it to a table.

For example, you may have an address-list document you wish to sort. *VP Data Capture* can put the data into a table, and *VP Document Editor* can sort the table. (See the *Document Editor Reference* volume 4 for table information.)

Key concepts of Data Capture

To operate Data Capture you use these elements:

- Source document
- Preamble
- Desktop auxiliary commands

Data Capture produces a document containing a table of data.

Source document

The *source document* is a ViewPoint document containing the *source data*, the data you want captured. The source document may also contain the *preamble*, which is your description of the data to be captured. Preambles are described in the next section.

In Data Capture, you refer to each vertical grouping of the source data as a *column*, and you refer to each single element of that column as a *field*. Figure 11-2 shows a source data example. In the example, "02-11-68" is a field in a column of dates.

Figure 11-2 **Source data example**

Smith, A.	02-11-68	12,778.23
Jones, E.	07-12-82	12,622.11
Price, W.	02-13-68	23,718.23

Since Data Capture was designed for text separated by spaces and new-line characters, there are a few rules that Data Capture follows when it encounters other types of formatting:

- A tab is treated as a single space. (See the "Format clause" section in Chapter 12 for the exception, when tabs are in literals.)
- New-paragraph characters are treated as new-line characters.
- Margins and text style properties are ignored, except for properties of the first left parenthesis in the preamble; the first left parenthesis determines properties of the resulting table text.
- Structure characters, such as frame anchors and page breaks, are ignored.

Refer to the "Formatting source data" section in Chapter 14 for more information.

Preamble

A preamble is a set of sentences you create to tell Data Capture which data to extract from the source data. You either place a preamble at the beginning of the source document, before the source data, or you use the [Set Preamble] command, described below, to tell Data Capture which document contains the preamble to be used.

Desktop auxiliary commands

Data Capture has three desktop auxiliary commands:

[Copy Text To Table]
: Causes Data Capture to copy data from the source document, into a table in a new document, as instructed by the preamble.

[Set Preamble]
Causes Data Capture to use the preamble in the selected document for all future Data Capture operations. The preamble is in effect until you log off, reboot your workstation, select [Discard Preamble], or select [Set Preamble] again.

In future Data Capture operations, if a source document has a preamble, that preamble is ignored. (However, if the preamble has errors that make it unrecognizable as a preamble, Data Capture treats it as if it were source data.)

[Discard Preamble]
Cancels the [Set Preamble] command. Until another [Set Preamble] command is invoked, Data Capture uses each source document's preamble.

ViewPoint table

Data Capture creates a ViewPoint document containing a table of the source data you specified. Tables are described in the *Document Editor Reference* volume 4.

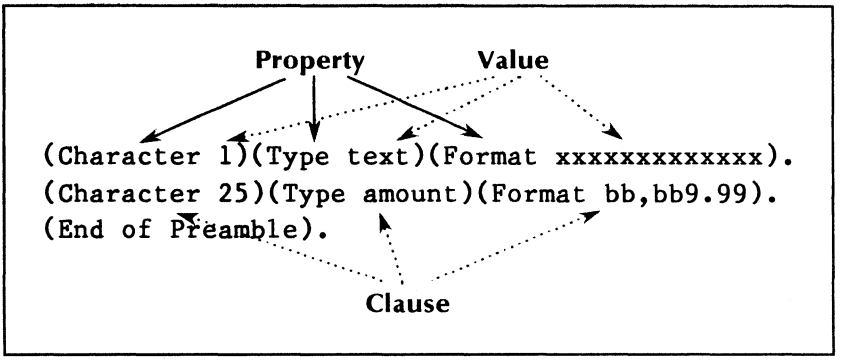
Preamble structure

A preamble provides a description of the data to be captured. You write a preamble by following the format described here and in Chapter 12, "Data Capture preamble clauses." The preamble causes Data Capture to scan your source data, matching it against patterns defined in the preamble.

The preamble is composed of sentences which, in turn, are composed of clauses. Each clause contains a property and a value. Figure 11-3 illustrates preamble structure. The sample preamble

has three sentences, written for the source data shown in Figure 11-2.

Figure 11-3 **Preamble structure**



Sentences

A *sentence* contains one or more clauses and ends with a period. You create a preamble sentence to indicate that a specific column of the source data is to be copied into a table column. The sentence must contain information about either the source data column's field format or length so Data Capture can determine how long the field is. All other source data information can be defaulted.

You use one sentence for each column that you want to appear in the table. If you do not want a particular column of source data to appear in the table, then do not create a sentence for it.

Clauses

You use *clauses* to describe the properties of the column data you want captured. Each type of clause describes a particular type of property. A clause has two parts—property and value—enclosed in parentheses. Properties and values

are described in the next chapter, "Data Capture preamble clauses."

End of Preamble clause

A sentence containing just "(End of Preamble)." is always the last sentence in a preamble, as shown in Figure 11-3. If the preamble is in the source document, the source data begins on the next line following the "(End of Preamble)." sentence. Either a new-line character or a new-paragraph character separates the preamble from the source data.

Group sentences

A *group column* is a divided column (a column of subcolumns) that contains one or more subrows.

The Projects column, shown in Table 11-1, is an example of a group column. It has two subcolumns and has multiple rows of project data for both Smith and O'Brien. Tables with divided columns are described in the *Document Editor Reference* volume 4. Group columns are explained in the "Data Capture preamble clauses" and "Writing preambles for Data Capture" chapters.

Figure 11-4 shows the general structure of the preamble used to produce Table 11-1. Indentations are used as a convenience to identify the subcolumn sentences.

The sentence describing the group column comes first, and the sentences describing its subcolumns follow immediately after. A sentence containing just "(End of Group)." follows the last subcolumn sentence. Groups that are contained within groups are called subgroups.

Table 11-1 **Table—group column**

Employee	Projects	
	Name	Due date
Smith, A.	Jupiter	4/ 1/88
	Venus	1/15/88
Jones, E.	Jupiter	4/ 1/88
O'Brien, W.	Apollo	1/15/88
	Venus	1/15/88
	Mars	7/30/88

Figure 11-4 **Preamble layout—group column**

```
Sentence for Employee column data.
Sentence for Projects group column.
 Sentence for Name column data.
 Sentence for Due date column data.
Sentence showing end of group.
Sentence showing end of preamble.
```

12. Data Capture preamble clauses

Data Capture scans the source data and extracts fields according to what is specified in the preamble. When a matching field is found, it is put in the table.

Clauses

You use clauses to describe the source data columns that are to be captured.

Clause structure

Each clause has a *property* and a *value*. The clause property is always one of Data Capture's keywords, such as Type. The clause value must be one of the acceptable choices for the particular property. If a property has a default (an assumed value) that is suitable, you do not need to specify the clause.

You enclose a clause in parentheses. Specify the clause property first and the clause value second. For example:

- (Character 1)
- (Type Amount)

The first example above is a Character clause. Its property is Character, and its value is 1. The second example is a Type clause. Its property is Type, and its value is Amount.

Commonly used clauses

- The Type clause designates field data type.

- The Format clause indicates field formatting.
- The Length clause indicates field length.
- Character and Line clauses tell field position.

Use other clauses to further define the fields you want captured.

All clause properties and values are explained in detail in the following sections. The clauses used most frequently are explained first. Clause properties and values are also summarized in Appendix L, "Data Capture clause properties and values."

The descriptions below use the terms leading and trailing. Leading characters are at the beginning of the field, and trailing characters are at the end of the field. In the example "$24.67 " the dollar sign is the leading character, and the space following the 7 is the trailing character.

Character clause

Property Character

Character designates the character position of the beginning of the field. Numbering starts at the left margin with 1. This property can apply to all types of columns except group columns. Group columns are described in the "Preamble structure" section and throughout the "Writing preambles for Data Capture" chapter.

Value A positive whole number having no commas or periods. Leading and trailing blanks are ignored.

Default 1

Type clause

Property Type

Type specifies the field's data type. The Format clause, described next, usually accompanies the Type clause.

Value The type of data in the field.

Choices are: Text, Amount, Date, and Group. If Type is Text, Amount, or Date, the value you specify becomes the property of the resulting table column. If Type is Group, the resulting column will be divided and have repeating subrows.

Text: Indicates the field can contain any characters, such as letters, digits, and symbols. Data Capture ignores leading and trailing blanks in captured Text fields and does not copy them into the resulting table.

Amount: Indicates the field can contain numbers and the symbols: +, -, $, *, period, comma, parentheses, and space.

Date: Indicates the field can be a Date format. Date formats are described in the "Format clause" section.

Group: Indicates the source data column is divided into one or more subcolumns. The sentence containing a (Type Group) clause is followed by a sentence for each subcolumn and is concluded by a sentence containing an (End of Group) clause.

Default Text

Format clause

Property Format

Format defines field length and appearance. You can use the Format clause when Type is Text, Amount, or Date, but not when Type is Group.

Note: Each sentence must have either a Format or a Length clause.

Value Either a *literal,* or a series of one or more *special format characters,* or a combination of both literals and special format characters. Literals and special format characters are described below. They tell what kinds of characters can exist in the data field.

Only one blank can separate Format from the value, and trailing blanks are not permitted. The Format value may contain up to 320 characters, including the quotes around literals.

Literals

To specify a literal, use single quotes around text. This indicates that the text inside the quotes has to occur in the source data exactly as indicated. (Even a tab character in a literal must have a matching tab in the data.) Data Capture uses the literal in its data scanning but does not store the literal in the resulting table.

Note: Use the single quote to specify a literal. If you are not using the ASCII keyboard's single quote ('), use the right single quote (') rather than the left single quote (').

Special format characters

The special format characters permitted for each value of Type are listed in this section. They can be in uppercase or lowercase. When they are mixed with a literal, they are outside the quotes

with no spaces between the special format characters and the literal.

Special format characters are summarized in Appendix M, "Data Capture special format characters."

Literals and special format characters

(Format 'Total 'x) is an example combining literals and special format characters. The clause directs Data Capture to scan the source data for the literal "Total " (including the space) followed by any character. When found, Data Capture copies the character into the table. The literal is not captured.

Exception: For fields described as Type = Text (see below), literals between the first and last special format characters are captured if the special format characters match non-blank data.

See "Capturing key data using literals" for more information on literals.

Format values according to Type value

The following sections tell what values you can use, depending on the value of Type:

Type = Text: You can intermix literals and special format characters to specify Text format. Text special format characters are described in Table 12-1.

Table 12-1 **Special format characters, Type = Text**

Format clause value	Corresponding field position contents
a	Letter or blank
9	Digit or blank
x	Any character
y	Any character except a blank

Type = Amount: Special format characters for Amount fields are shown in Table 12-2. You can combine literals and Amount special format characters provided there is not more than one contiguous sequence of Amount special format characters. (You cannot put a literal between two Amount special characters, as you can with Text or Date special format characters.) Field width can be up to 15 characters.

Note: For languages in which the functions of commas and decimal points are reversed, the comments in Table 12-2 for commas and decimal points should also be reversed.

Table 12-2 **Special format characters, Type = Amount**

Value	Corresponding field position contents	Comments
9	Digit	
b	Digit, blank, comma, decimal point, left or right parenthesis, minus sign (or standard keyboard hyphen)	The character position can contain a blank if it represents a leading zero to the left of the decimal point or trailing zero to the right of the decimal point. The character position can also contain the symbols for these types of currency: dollar, cent, yen, pound, franc, peseta, cruzeiro, and florin, although none of these is captured.
*	Digit or asterisk	The character position can contain an asterisk if it represents a leading zero.
+	Plus sign, minus sign (or standard keyboard hyphen), blank	The plus special format character can only be used as the first character of the format value.
-	Minus sign (or standard keyboard hyphen), blank, plus sign, asterisk	The minus special format character can only be used as the first or last character of the format value. A trailing minus special format character will not match a plus sign or asterisk. A leading minus special format character will only match an asterisk if the second character in the format is an asterisk.

Table 12-2 **Special format characters, Type = Amount (continued)**

Value	Corresponding field position contents	Comments
( )	Parentheses or blank. Characters in the ( ) may be: digit, blank, comma, decimal point, asterisk.	This is an alternative way to express negative amounts in the source data—the quantity is enclosed in parentheses. Data Capture copies the quantity into the resulting table with a minus sign rather than parentheses. In the Format value, plus and minus signs are not allowed inside the parentheses, just as a parenthesis may not follow a plus or minus. The left parenthesis can match an asterisk if the next format character is an asterisk.
	Comma (See next column for alternatives.)	If the character left of the comma in the format value is b or *, and that character's corresponding data field character is not a digit, the comma is treated as b or *. The comma can also match a plus sign, minus sign (or standard keyboard hyphen), blank, left parenthesis, or right parenthesis.
	Decimal point	The decimal point can also match a minus sign (or standard keyboard hyphen), blank, or right parenthesis.

Type = Date: You can use any combination of literals and Date special format characters to specify the Date format of the source data. Only numeric, fixed-length dates are supported. Use the three special format characters, M, D, and Y

(for month, day, and year), optionally separated by literals.

M and D must each appear twice as contiguous characters. Y can appear contiguously, two or four times. No spaces are allowed between the M, D, and Y designations and their adjacent literals. Literals can also precede and follow the date in the format.

Examples of valid Date format specifications are:

DD'/'MM'/'YY
YYYY'-'MM' 'DD
YY' 'MMDD' date'
DD'.'MM'.'YY

Note: A single-digit month or day in the source data must have a preceding space.

The date format in the resulting table is language-specific. (Refer to the "Language clause" section to specify language.) For US English, the resulting date will always be in the form MM/DD/YY or MM/DD/YYYY. It will have the "/" separator and "month, day, year" ordering. The number of characters in year is dependent upon the source data.

Default The default varies according to Type:

Type = Text: The default Text format is all x's. The number of x's is taken from the Length property.

Type = Amount: All b's, with a leading minus sign. The total number of characters, including the minus sign, is taken from the Length property.

Type = Date: The default Date format is MM'/'DD'/'YY. Default date separator; month, day, year ordering; and number of characters in year are all language-specific.

Length clause

Property Length

Length specifies the number of characters in the source to be extracted. This can be used instead of the Format clause. For example, (Length 8) is equivalent to (Format xxxxxxxx) for a Text column or (Format -bbbbbbb) for an Amount column. However, when the source data has unique properties, it is best to use the Format property so Data Capture can scan the data with the most specific criteria possible.

Note: Each sentence must have either a Format or a Length clause.

Value A positive whole number having no commas or periods. Leading and trailing blanks are ignored.

Default The default is taken from the length of the Format value.

Comment clause

Property Comment

Comment contains an explanatory message for readers of the preamble. Data Capture ignores this clause.

Value Arbitrary text, not including a left or right parenthesis. There is always a space separating Comment from its value, even when the value is on the next line. Comment values may contain as many characters as you wish.

Default No comment

Name clause

Property Name

Name has two effects: First, the specified name is placed in the heading of the corresponding column in the resulting table. Second, the name becomes the table column name that you see in the table column property sheet and use in field fill-in rules.

Value A text string of up to 320 characters. A Name value cannot include right parentheses. Leading and trailing blanks are ignored.

Examples of Name clauses are (Name Employee) and (Name Salary).

Note: A Name value is a string of characters. Quotes are not used.

Names of columns at the same level must be different from each other. (You can, however, give a group column and one of its subcolumns the same name.)

Default The heading of the corresponding column in the resulting table is empty. The corresponding table column name, which is used in field fill-in rules, is a system-generated name, such as Column23.

Case clause

Property Case

Case causes the case of letters to be changed as Data Capture stores source data in the table.

Value Choices are described in Table 12-3.

Default S

Table 12-3 **Case value choices**

Format character	The case of the corresponding table data
S	Case of all characters is same as in source data.
U	All characters are uppercase.
L	All characters are lowercase.
UL or UL UL	First character of each word in the data is uppercase; remaining characters are lowercase.
UL LL	First character of first word in the data field is uppercase; remaining characters are lowercase.
UL SL	First character in the first word is uppercase; the first character of remaining words is the same case as in the source data; all other characters are lowercase.

Line clause

Property Line

Line designates the relative line number of the line in the source data containing this data field. You use the Line clause only when multiple lines of source data, each terminated by a new-line character, are to make up one row of table data. (To Data Capture, a line terminates when a new-line character is found.)

Line numbering starts with 1 and is relative to the first source data line for a particular row of table data. For example, if three lines make up one row of table data, you use the clauses (Line 1), (Line 2), and (Line 3) to refer to data fields in each of the three lines. Each time a table row is completed, line numbering starts with 1 again.

Refer to the "Working with multiple data lines" section for examples.

Value A positive whole number having no commas or periods. Leading and trailing blanks are ignored.

Default 1

After clause

Property After

Designates fields that appear in the source data below a group. For example, in computer-generated reports, subtotals often appear below a data group. You cannot specify a Line clause and an After clause in the same sentence.

The After clause is a special kind of Line clause. The After clause is needed because the Line clause requires a specific line number value, but the line number of a field below a group can vary since the number of lines is a group can vary.

Value The name of a group column

Default None

Required clause

Property Required

Required indicates that if the source data field does not match, its entire table row will be omitted from the table. A field is considered not to match when either it does not correspond to its Format clause or its characters are all blanks. If a field does not match and is not required, no value is stored for that particular field; however, the table row will still be created, unless none of the other fields for that row match.

At least one field in a table row must be required. The Required clause applies to all columns except group columns, which are never required. (At least one subcolumn within a group column must be required, however.)

Value Yes or No

Default Yes

Language clause

Property Language

Language indicates the language to be assumed for the source data field and the language to be assigned to the corresponding table column.

Language also determines:

- The acceptable decimal and thousand separators in Amount Format clauses and source data fields
- The default format for Date fields
- The Date separator used in dates placed in the table
- The ordering of month, day, and year in dates placed in the table

Value Language choices are:

USEnglish, US English, UKEnglish, UK English, French, German, Swedish, Italian, Dutch, Danish, Norwegian, Finnish, Spanish, Portuguese, Japanese, FrenchCanadian, French Canadian, EnglishCanadian, English Canadian.

Capitalization of the values is optional, and two-word values can appear as one word or two.

Default The default language of the workstation

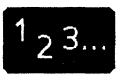
13. Data Capture procedures

To check that Data Capture is running on your workstation, look in the desktop auxiliary menu. If you see these commands, Data Capture is running:

- [Set Preamble]
- [Copy Text To Table]
- [Discard Preamble]

If Data Capture is not running, you must load and enable the application. For information on loading and enabling software, refer to either the 6085 or the 8010 *Software Installation* volume.

Preparing to run Data Capture



To prepare to run Data Capture, do the following:

1. Modify the source data, if necessary, so it is suitable for Data Capture.
2. Write a preamble, if one is not available, to capture the data you want.
3. Designate the preamble to be used.

Modifying the source data

Documents created from emulation sessions are usually formatted correctly for Data Capture. In some cases, it may be necessary to replace or eliminate unwanted characters in the source data.

- Use <FIND> to replace unwanted punctuation with new-line characters.
- Use <FIND> and <DELETE> to eliminate unwanted characters.

Refer to Appendix N, "Data Capture source data modification."

Creating the preamble

Your preamble must have:

- A sentence for each column of data to be captured
- Information about each field's format or length
- An "(End of Preamble)." sentence

Refer to the "Data Capture preamble clauses" chapter for clause descriptions and the "Writing preambles for Data Capture" chapter for suggestions and examples.

Designating the preamble

Data Capture must have a preamble to follow when it scans the source data. Either place the preamble at the beginning of your source document, or indicate which document contains the preamble to be used.

Inserting the preamble in the source document

If the preamble resides in the source document, it must appear at the beginning of the document. The source data must follow the preamble.

Setting a preamble for future use

You can use the same preamble to capture data from different documents, provided the data from the documents follows the same pattern.

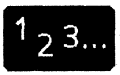
1. Select the icon of the document containing the preamble.
2. Select [Set Preamble] in the desktop auxiliary menu.

Note: If you select [Set Preamble] after another preamble has already been set, Data Capture asks you for confirmation and then replaces the old preamble with the new one. If the new preamble is invalid, the old one is still in effect.

Discarding the set preamble

Select [Discard Preamble] in the desktop auxiliary menu.

Running Data Capture



After you have placed the preamble in your source document or have designated the preamble to be used with the [Set Preamble] command, you are ready to capture the data.

Applying Data Capture to documents

To run Data Capture on a document or on an extended selection of documents:

1. Select the source document or documents.
2. Select [Copy Text To Table] in the desktop auxiliary menu.

Information messages appear in the message area while Data Capture is running. When all the source data in a document is captured, a new document containing a table of the captured data is placed on the desktop near the source document. This is repeated for each document in the selection.

Data Capture names each new document with the source document name, the text "COPIED TO TABLE," and the date and time:

"Source document COPIED TO TABLE date time"

Applying Data Capture to folders

You run Data Capture on a folder the same way you do on a document. If no preamble was set by [Set Preamble], then there must be a preamble in each source document in the folder.

1. Select the folder of source documents.
2. Select [Copy Text To Table] in the desktop auxiliary menu.

Data Capture creates a folder with the same structure as the original, with all the folder and document levels inside the folder duplicated.

Data Capture names the folders it creates in one of two ways:

- If no preamble is set, the new folder name is the same as the original folder name.
- If a preamble is set, the new folder name is the same as the original folder, followed by a dash, followed by the name of the document having the preamble that Data Capture used:

  "Folder name-preamble document name"

Stopping Data Capture

Press <STOP> to cancel a Data Capture operation. This may result in a partially completed table.

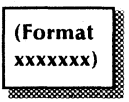
14. Writing preambles for Data Capture

The first three sections in this chapter provide general information about writing preambles. The remaining sections tell how to write preambles for many of the examples you will encounter.

The examples are explained by presenting the following types of information:

- Purpose of example
- Source data
- Preamble
- Explanation of preamble
- Resulting table, created by Data Capture

In the examples, properties of the tables created by Data Capture were modified to demonstrate presentation styles. For example, headings were made bold face, and column widths were changed to improve appearance.



Throughout this section, special formatting notes and hints are highlighted with a graphic representation of a Format clause, as shown at the left of this paragraph.

General rules and limitations

When you write a preamble, these general rules apply:

- Always end preamble sentences with periods.
- Clauses can appear in any order in a sentence.

- The properties you assign to the first left parenthesis in the preamble will be the properties of the resulting table text.
- Except for the first left parenthesis, the properties of all other preamble characters are ignored.
- Paragraph properties are ignored.
- Use extra spaces or tabs to help make the preamble more readable. You can also use extra new-line characters between clauses and sentences. Data Capture ignores these in the preamble (but not in the source data).
- Case does not matter. You can use upper-case, lowercase, or mixed case.
- Sentence order in the preamble determines column order in the resulting table. Refer to the "Defining table column order" section.
- The maximum number of fields that Data Capture can copy into a table is determined by the Document Editor. Data Capture itself does not have a limitation.

Formatting source data

- Use a fixed-pitch font, such as Pica or Vintage, to display the source data. If you do this, characters align vertically, and their positions can be determined easily.
- You will find it easier to write a preamble for source data formatted with spaces rather than data formatted with tabs and margins. You may miscount character positions if there appear to be more spaces and new-line characters in the data than there really are.
- Sometimes it appears that there are several lines of text when there is actually only one. This is called line *wraparound,* and it occurs

when the page width is not wide enough for the long line. Display the non-printing characters to view the tabs and actual ends of lines.

You do not have to reformat source data that has line wraparound. Data Capture treats data as one line until it finds a new-line character. For convenience, you may want to change your page width and repaginate so you can see the data as Data Capture views it.

- Source data lines may have different lengths. You do not need to make them have the same length. Whenever the preamble refers to a character position that is beyond the end of a source data line, Data Capture assumes the character position contains spaces.

Counting characters

When writing a preamble, you can add a counting line to your source data to more easily determine character positions. Both source data and character counter should be in a fixed-pitch font, such as Pica or Vintage, so source characters align vertically. Making each of the zeros bold in the counting line helps you to count by tens. To add a counting line do the following:

1. Start a new line in the source data.
2. Enter **1234567890**.
3. Press <AGAIN> to enter another **1234567890**. Continue pressing <AGAIN>, as needed.
4. Select each zero in turn and press <BOLD>. Figure 14-1 shows source data with a counting line inserted.

Data Capture ignores a counter line in the source data, provided the preamble does not instruct it

to pick up data of that format. You can also place a counting line inside the preamble within a comment. The Comment clause value should begin with a new-line character so numbering will start in column 1. See "Using Comment and Name clauses" for more information.

Figure 14-1 **Source data with counting line**

```
  EMPLOYEE     HIRED      YTD EARNINGS
12345678901234567890123456789012345678
Smith, A.       02-11-74   12,778.23
Jones, E.       07-12-82   12,622.11
```

Capturing data—a standard example

This section shows a standard way for you to capture a column of data.

Character clause: Use the Character clause to indicate the character position where the data field begins.

Type clause: Use the Type clause to indicate the field's data type.

Format clause: Use the Format clause to tell what the field looks like and how many characters it can contain.

Source data The source data in Figure 14-2, created from a [Make Document] or [Make Screen] operation, has heading information followed by three columns of data. A counting line has also been inserted. Each line of data is terminated by a new-line character.

Preamble The preamble in Figure 14-3 instructs Data Capture to extract two columns from the source data and put them into a ViewPoint table.

Figure 14-2 **Source data—standard example**

```
   PERSONNEL REPORT FOR 12/23/87
   MARKETING DEPT.

 EMPLOYEE      HIRED      YTD EARNINGS
12345678901234567890123456789012345
Smith, A.       02-11-74   12,778.23
Jones, E.       07-12-82   12,622.11
Price, W.       02-13-68   23,718.23
Liou, D.        12-11-78   26,737.00
```

Figure 14-3 **Preamble—standard example**

```
(Character 1)(Type Text)(Format xxxxxxxxxxxxx).
(Character 25)(Type Amount)(Format bb,bb9.99).
(End of Preamble).
```

Explanation The three clauses in the first sentence of the preamble tell the software to copy data from the Employee column. The clauses in the second sentence say to copy data from the YTD EARNINGS column. Data Capture does not extract data from the first four source data lines because those lines do not satisfy the preamble sentence specifications. (For example, the lines do not have digits starting at position 25 in the specified format.)

- The two Character clauses instruct Data Capture to extract the fields starting at character positions 1 and 25.
- The Type clauses tell what kinds of data Data Capture should expect.
- In the first Format clause, the 13 x's indicate a field width of 13 characters. The second Format clause says that the field will be 9 charac-

ters long. The b's indicate where either blanks or digits may be encountered, and the 9's where digits must be encountered.

Data Capture will expect to find the decimal point in the position indicated. It will expect to find a comma as indicated only if there is a digit to the left of where the comma would appear.

Resulting table By following the preamble instructions, Data Capture produced a document containing the table shown in Table 14-1. Often you will want column headings in the table as well. Specifying column headings is explained in the "Name clause" section.

Table 14-1 **Resulting table—standard example**

Smith, A.	12,778.23
Jones, E.	12,622.11
Price, W.	23,718.23
Liou, D.	26,737.00

Ignoring extraneous data

Your preamble causes Data Capture to copy just the desired data into your table. This example shows a preamble that is not as explicit as it should be. Extra data fields are copied into the table.

Source data The source data in Figure 14-4 is the same as in the previous example.

Preamble The preamble in Figure 14-5 specifies the employee name and earnings fields.

Figure 14-4 **Source data—extraneous data**

```
   PERSONNEL REPORT FOR 12/23/87
   MARKETING DEPT.

 EMPLOYEE     HIRED     YTD EARNINGS
12345678901234567890123456789012345
Smith, A.      02-11-74   12,778.23
Jones, E.      07-12-82   12,622.11
Price, W.      02-13-68   23,718.23
Liou, D.       12-11-78   26,737.00
```

Figure 14-5 **Preamble—extraneous data**

```
(Character 1)(Type Text)(Format xxxxxxxxxxxxx).
(Character 25)(Type Amount)(Format bbbbbbbbb).
(End of Preamble).
```

Explanation The preamble specifies the earnings field with (Format bbbbbbbbb) rather than (Format bb,bb9.99), as it should. (The "b" allows a digit, blank, comma, or decimal point.)

Resulting table By following the less specific preamble instructions, Data Capture produced a document containing the table shown in Table 14-2.

In this case, the counting numbers were captured too. The first 13 characters, starting in position 1, were captured according to the (Format xxxxxxxxxxxxx) statement, and the 9 characters, starting in position 25, were captured according to the (Format bbbbbbbbb) statement. In a more complex example, additional text might have been captured.

Table 14-2 **Resulting table—extraneous data**

1234567890123	567890123
Smith, A.	12,778.23
Jones, E.	12,622.11
Price, W.	23,718.23
Liou, D.	26,737.00

(Format bb9.99)

To ensure that Data Capture ignores all extraneous text, make your preamble as explicit as possible. The "b" allows a digit, blank, comma, or decimal point for Amount fields.

Using Comment and Name clauses

This example shows how to use Comment and Name clauses.

Comment clause: Use the Comment clause to make the preamble more readable to you.

You may also find comments useful for recording explanatory information that you might forget later. Data Capture ignores Comment clauses.

Name clause: Use the Name clause to supply the field's column heading in the resulting table.

The name you designate will also be the column name in the Column property sheet, for use in fill-in rules. Name clauses also improve preamble readability.

Source data A data sample is shown in Figure 14-6.

Figure 14-6 **Source data—Comment/Name**

```
EMPLOYEE        HIRED      YTD SALARY
Smith, A.       02-11-74   12,778.23
Jones, E.       07-12-82   12,622.11
```

Preamble The preamble in Figure 14-7 instructs Data Capture to copy two columns from the source data into the table.

Figure 14-7 **Preamble—Comment/Name**

```
(Comment Preamble prepared by J. D. Smith).
(Name Emp. name)(Format xxxxxxxxxxxxx)
  (Comment LastName, FirstInitial).
(Name YTD salary)(Type  Amount)(Character 25)
  (Format bb,bb9.99).
(Comment
12345678901234567890123456789012345678901234
).
(End of Preamble).
```

Explanation There are three differences between this preamble and the preamble in Figure 14-3. They are:

- The Name clauses cause column headings to appear in the table. The names of the columns in the Column property sheets will be the same as the heading names.
- Comment clauses are used for counting and to record explanatory information.
- In the first sentence, which has three lines, the Character and Type clauses are omitted.

(Character 1) and (Type Text) are the defaults that are used.

Resulting table Table 14-3 is similar to Table 14-1; however, because of the Name clauses, Table 14-3 also has heading information.

Table 14-3 **Resulting table—Comment/Name**

Emp. name	YTD salary
Smith, A.	12,778.23
Jones, E.	12,622.11

Using the Length clause

You can avoid writing long strings of format characters for fields that have simple Text or Amount formats and do not require explicit Format clauses. Examples are shown in Figure 14-8.

Length clause: Use the Length clause for simple Text or Amount formats to avoid writing long Format clauses.

Figure 14-8 **Length clauses for simple formats**

Use:	Instead of:	for:
`Length 9`	`Format xxxxxxxxx`	`Text field`
`Length 8`	`Format -bbbbbbb`	`Amount field`

Refer to the "Format clause" section and the various examples of Format clauses to learn about

capturing more complex Text or Amount formats.

Indicating Date formats using literals

Literals and Date punctuation: Use literals to indicate punctuation in Date formats.

Example 1: A standard date preamble

Previous examples show the preambles and source data separately for ease of presentation. This example shows them together. The preamble is often placed in the same document as the source data.

Source data The source data in Figure 14-9 has dates containing dash separators.

Preamble The preamble, also shown in Figure 14-9, causes Data Capture to copy the three dates into a table.

Figure 14-9 **Source data and preamble—standard date formats**

```
(Type Date) (Format MM'-'DD'-'YY)
(Character 14).
(End of Preamble).
Smith, A.     02-11-74    12,778.23
Jones, E.      7-12-82    12,622.11
O'Brien, W.   02-13-68    23,718.23
```

Resulting table The resulting table in Table 14-4 has one column with three rows of dates. The second date in the source data has a leading blank, which Data Capture is able to recognize and include in the table.

Note: The preamble describes the source data format. For dates, Data Capture always uses the "/" in the resulting table dates for fields that have the language property "US English."

Table 14-4 **Resulting table—standard date formats**

02/11/74
7/12/82
02/13/68

(Format '-')

Be sure to use the single quote to specify a literal. If you are not using the ASCII keyboard ('), be sure to use the right single quote (') rather than the left single quote (').

Example 2: Dates and Format clauses

Figure 14-10 shows examples of source data layouts for February 4, 1988, with their corresponding Format clauses.

Figure 14-10 **Dates and their Format clauses**

Date layout:	Format clause:
02/04/88	(Format MM'/'DD'/'YY)
02-04-88	(Format MM'-'DD'-'YY)
880204	(Format YYMMDD)
04 02 88	(Format dd' 'MM' 'YY)
2 4 88	(Format MM' 'DD' 'YY)
4/02/88	(Format DD'/'MM'/'YY)
1988.02.04	(Format YYYY'.'MM'.'DD)
Report of 4/ 2/88	(Format 'Report of 'DD'/'MM'/'YY)

Capturing key data using literals

Literals and special text: Use literals in your preamble to capture special parts of the source data.

This section provides two examples: capturing labeled data and capturing indented text.

Example 1: Labeled data—subtotals

This example illustrates how to capture only subtotals.

Source data In Figure 14-11, a subtotal follows employee data for each of the two regions, the Eastern region and the Central region.

Figure 14-11 **Source data—subtotals**

```
Region: Eastern
EMPLOYEE  HIRED  YTD EARNINGS
 Smith, A.    02-11-74   12,778.23
 Jones, E.     7-12-82   12,622.11
 O'Brien, W.  02-13-68   23,718.23
Total Eastern           49,118.57
12345678901234567890123456789012345
Region: Central
EMPLOYEE  HIRED   YTD EARNINGS
 Liou, D.     12-11-78   26,737.00
 Smith, D.    12-21-82    7,706.94
Total Central           34,443.94
```

Preamble The preamble shown in Figure 14-12 instructs Data Capture to copy the two subtotals and their labels from the source data into the table.

Figure 14-12 **Preamble—subtotals**

```
(Character 1)(Format 'Total 'xxxxxxx)(Type Text).
(Character 25)(Format bb,bb9.99)(Type Amount).
(End of Preamble).
```

Explanation The literal 'Total ' in the first format clause indicates that only lines starting with those six characters (Total) are used. Then the next seven characters, designated by xxxxxxx, are copied. Literals and special format characters can coexist in a Format clause for a Text field, as in this example, or one can be present without the other.

Resulting table The resulting table, as shown in Table 14-5, contains the region names (not including the literal 'Total ') and the region subtotals.

Table 14-5 **Resulting table—subtotals**

Eastern	49,118.57
Central	34,443.94

Example 2: Indented text

This example illustrates how to capture indented text, in this case a list of employee names. Also refer to "Taking advantage of data indentations."

Source data In Figure 14-13, the employee names start in character position 2 and are always preceded by a blank. In this example there are new-line characters after Marketing, Administration, and Sales, as well as after the city names.

Figure 14-13 **Source data—indented text**

```
Field Staff          Page 1
1234567890123456789012345678 90
 Smith, A.     Marketing
St. Louis
 Jones, E.     Administration
Chicago
 O'Brien, W.   Sales
Chicago
```

Preamble The preamble in Figure 14-14 takes advantage of the indented names by specifying a blank in character 1. Character 1 is the default.

Figure 14-14 **Preamble—indented text**

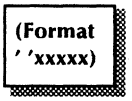
```
(Format ' 'xxxxxxxxxxxx).
(End of Preamble).
```

Explanation The first 12 characters after the blank are copied from every line that starts with a blank. The cities start in character position 1 but do not start with a blank, so they are not captured.

Resulting table Table 14-6 has just the names. The literal is not copied into the table.

Table 14-6 **Resulting table—indented text**

Smith, A.
Jones, E.
O'Brien, W.



Use a space in your Format clause to distinguish between data that start in two different adjacent character columns.

Specifying case and text properties

Since the text from a terminal emulation window is often in uppercase letters and always has the same set of text properties, you may want to change the case and properties of text in the table Data Capture produces for you. You can either specify these new properties in the preamble, or you can modify the table text later.

Specifying case

Case clause: Use the Case clause to indicate the case for letters that are to be copied into the table.

In the value portion of the Case clause, "U" stands for uppercase and "L" stands for lowercase. Figure 14-15 contains examples of case values. Refer to the Case clause section for more information.

Figure 14-15 **Case examples**

Case value:	Source data:	Resulting table text:
U	ytd	YTD
L	EARNINGS	earnings
UL UL or UL	TOTAL CENTRAL	Total Central
UL LL	TOTAL CENTRAL	Total central

"UL" is a convenient abbreviation for "UL UL." They both indicate the same case specification.

Specifying properties

All the text in the table produced by Data Capture has the same character properties. You can determine what those properties will be by setting the properties of the first left parenthesis in the preamble.

For example, if (Format ' 'xxxxxxxxxxxx) is the first clause in a preamble, you set the properties of the left parenthesis. (Select the parenthesis, and either display its Character property sheet, or use the function keys, such as <FONT>, <BOLD>, or <UNDERLINE>.) All the text in the resulting table will have the same properties as the left parenthesis.

Capturing fields that wrap around

Sometimes source data lines wrap around onto one or more additional document lines without being separated by new-line characters. Since Data Capture starts counting characters from character position 1 and continues until it finds a new-line character, you treat wraparound data as if it were all one line.

You do not need to reformat source data that has line wraparound. Data Capture can recognize a field even when it is divided by line wraparound. (Data Capture does not recognize a field if it is divided by a new-line character, however.)

Source data

The dates in the source data, Figure 14-16, are an example of line wraparound. Month, day, and year are each separated by a space. There is no new-line character between day and year, but there is one following year.

Figure 14-16 **Source data—wraparound**

```
123456789012345678901234567890123
Smith, A.      12,778.23    2 11
74
Jones, E.      12,622.11    7 12
82
Price, W.      23,718.23    2 13
68
```

Preamble The preamble in Figure 14-17 instructs Data Capture to copy the name and date from the source data to the table. You do not need to indicate anything special in the preamble for wraparound. (The counting line also is wrapped around.) Character 26 is specified, rather than character 27, to accommodate the 2-digit month format.

Figure 14-17 **Preamble—wraparound**

```
(Character 1)(Type Text)(Format xxxxxxxxxxxxx).
(Character 26)(Type Date)(Format MM' 'DD' 'YY).
(End of Preamble).
```

Resulting table By following the preamble instructions, Data Capture produced Table 14-7.

Table 14-7 **Resulting table—wraparound**

Smith, A.	2/11/74
Jones, E.	7/12/82
Price, W.	2/13/68

Working with multiple data lines

Unlike the previous section, "Capturing fields that wrap around," this section illustrates sets of data that not only appear to be on more than one line, they actually are. Each document line is terminated by a new-line character.

Line clause: Use the Line clause to treat multiple lines of data as if they were all one line.

Example 1: Data on two lines

Source data In the example shown in Figure 14-18, new-line characters follow the city field and the second numerical field. The numerical fields occur on the second line of each employee's record.

Preamble The sentences for the two numerical fields in the preamble (Figure 14-18) use Line clauses to indicate line number. The first sentence has an implied Line clause, since (Line 1) is the default.

Explanation Using the preamble, Data Capture scans the source data until it finds a line with a blank in character position 1. The following 12 characters are copied into the table. Data Capture then scans until it finds a new-line character. Next, it scans for the two Amount fields in the new line.

Resulting table The name and two numerical fields appear in the same table row, as shown in Table 14-8.

Figure 14-18 **Source data and preamble—data fields on second line**

```
(Format ' 'xxxxxxxxxxxx).
(Type Amount)(Format bb,bb9)(Character 15)
(Line 2).
(Type Amount)(Format b,bb9)(Character 23)(Line 2).
(End of Preamble).
Field Staff                          Page 1
123456789012345678901234567890123456789O
 Smith, A.      Marketing    St. Louis
               12,122   1,220
 Jones, E.      Admin.         Chicago
               10,123     240
 O'Brien, W.    Sales          Chicago
               32,162   3,640
```

Table 14-8 **Resulting table—data fields on second line**

Smith, A.	12,122	1,220
Jones, E.	10,123	240
O'Brien, W.	32,162	3,640

Example 2: Data fields on separate lines

Source data In the example shown in Figure 14-19, each data field for an employee is terminated with a new-line character. Use Line clauses to make all the data for an employee appear in a single row in the resulting table, as shown in Table 14-9.

Figure 14-19 **Source data and preamble—data fields on separate lines**

```
(Format 'Empl:   'xxxxxxxxxxxx).
(Line 2)(Length 50)(Character 9).
(Line 3)(Length 50)(Character 9).
(End of Preamble).
12345678901234567890123456789O
Empl:   Smith, A.
Dept:   Marketing
Title:  Group Manager

Empl:   Jones, E.
Dept:   Administration
Title:  Bookkeeper

Empl:   O'Brien, W.
Dept:   Sales
Title:  Customer Representative
```

Preamble As in the previous example, each sentence in the preamble in Figure 14-19 uses a Line clause to indicate line number. The first sentence has an implied Line clause.

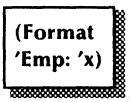
Explanation The Line clauses instruct Data Capture to treat each set of three lines as if they were one line.

The literal 'Empl: ' causes Data Capture to pick up employee names. If the literal had been omitted and the character position specified instead, Data Capture would have copied part of the counting line into the first row of the resulting table. The contents for the other rows also would have been incorrect.

Resulting table The resulting table, shown in Table 14-9, has three rows of data.

Table 14-9 **Resulting table—data fields on separate lines**

Smith, A.	Marketing	Group Manager
Jones, E.	Administration	Bookkeeper
O'Brien, W.	Sales	Customer Representative



Use literals, such as the literal 'Empl: ' used in the preceding example, to make your preamble as specific as possible.

Example 3: Data identified by key text

This example shows how to use literals and the Line clause to capture only subtotals.

Source data In the source data shown in Figure 14-20, dashes precede the subtotals for each region.

Preamble Previous examples have shown literals and special format characters coexisting in one Format clause. This preamble (Figure 14-21) has a literal as the sole value of the first Format clause. The clause instructs Data Capture to scan for the literal but not capture it. The preamble then instructs Data Capture to extract the numerical field following the literal.

Figure 14-20 **Source data—key text**

```
Region: Eastern
 Smith, A.      02-11-74    12,778.23
 Jones, E.      07-12-82    12,622.11
 O'Brien, W.    02-13-68    23,718.23
                            ---------
                            49,118.57
12345678901234567890123456789012345
Region: Central
 Liou, D.       12-11-78    26,737.00
 Smith, D.      12-21-82     7,706.94
                            ---------
                            34,443.94
```

Figure 14-21 **Preamble—key text**

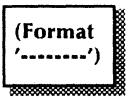
```
(Character 26)(Format '---------')(Line 1).
(Character 26)(Format bb,bb9.99)(Type Amount)
(Line 2).
(End of Preamble).
```

Explanation Data Capture scans for the dashes. Once it finds them, Data Capture looks for a new-line character and then scans for the Amount field.

Resulting table The resulting table, shown in Table 14-10, has the subtotals.

Table 14-10 **Resulting table—key text**

49,118.57
34,443.94



Use Format clauses which have only literals to locate key text that precedes a data field you wish to capture.

Indicating data fields can be blank

Usually each preamble sentence has a matching field in each source data line. (Exceptions occur when a logical line of source data contains new-line characters or when data are in group columns. Refer to the "Working with multiple data lines" and "Capturing group columns" sections.)

In documents created from emulation sessions, however, fields that contain all zeros are often represented by blank spaces. Unless you indicate that such a field may be blank, Data Capture will interpret the blank field as a mismatch and ignore the entire data line.

Required clause: Use the Required clause to indicate whether or not fields must contain data.

If you specify (Required No), a mismatch for the field results in an empty field in the table. Data Capture still produces the rest of the table row for that line of source data. (Required Yes), the default, means that a mismatch for that field is a mismatch for the entire table row, and the row is not copied into the table. At least one field must be required for every row of data.

This example shows how to ensure that a row is created in the resulting table for each line in the source data, including the lines that have blank fields.

Source data The source data shown in Figure 14-22 lists employee name and highest degree attained. No degree is listed for Jones.

Figure 14-22 **Source data—blank field**

```
12345678901234567
Smith, A.    B.A.
Jones, E.
O'Brien, W. B.S.
Liou, D.     Ph.D.
```

Preamble The preamble in Figure 14-23 indicates that the degree field is not required.

Figure 14-23 **Preamble—blank field**

```
(Name Employee name)(Format axxxxxxxxxx).
(Name Degree level)(Character 13)
  (Length 6)(Required No).
(End of Preamble).
```

Explanation Data Capture creates a row for Jones, as well as for the other employees, even though the Jones Degree field is empty.

Resulting table The table is shown in Table 14-11.

Table 14-11 **Resulting table—blank field**

Employee name	Degree level
Smith, A.	B.A.
Jones, E.	
O'Brien, W.	B.S.
Liou, D.	Ph.D.

Capturing group columns

This section discusses using the (Type Group) clause to capture data that belong in divided columns and repeating subrows in the resulting table. Divided columns and repeating rows are described in detail in the *Document Editor Reference* volume 4. Also, subsequent sections in this chapter provide more examples that use the (Type Group) clause.

Divided columns and repeating subrows: When one column of data has subordinate columns, it is called a divided column with subcolumns. A divided column produced by Data Capture has repeating subrows. This means that if a resulting table row contains divided subcolumns, then those subcolumns will contain one or more subrows.

For example, in Table 14-12, Orders is a divided column with three subcolumns: Date, Unit 1, and Unit 2. The rows of data under Orders are all called subrows, even though Company A and Company B each have only one subrow. Company C has two subrows of data.

Table 14-12 **Example—repeating subrows**

Company name	Orders		
	Date	Unit 1	Unit 2
Company A	3/ 7/86	50	80
Company B	1/21/86	12	13
Company C	2/ 7/86	2	12
	8/15/86	5	19

- In Data Capture, a divided column in the source data is called a group.
- If a subcolumn in the source data is also divided, it is also a group and is referred to as a subgroup.

Group clauses: Use the (Type Group) and (End of Group) clauses to indicate groups or subgroups.

Example 1: Groups

The example shown in Figure 14-24 is more complex than previous examples. Each employee has completed a varying number of degrees, and one employee has no degree.

Source data This example has both subcolumns and subrows. (The resulting table for this example is shown in Table 14-13.) Degrees is the group column. Degree level is one subcolumn, and Degree year is the other subcolumn. There is one row of data for each person, with repeating subrows for the person's degrees.

Preamble In a preamble description of a group, the sentence describing the group comes first, and sentences describing the group components follow immediately after. A sentence containing

Figure 14-24 **Source data—groups**

```
12345678901234567890123456789012345678901234567890123456
Smith, A.     Marketing   St. Louis   B.A.     1980
Jones, E.     Admin.      Chicago
O'Brien, W.   Sales       Chicago     A.A.     1977
                                      B.S.     1980
Liou, D.      Research    Detroit     B.A.     1955
                                      M.S.     1957
                                      Ph.D.    1962
```

only the (End of Group) clause terminates the group description. The preamble shown in Figure 14-25 causes the name, degree levels, and degree years to be captured for each employee.

Group indentation: To improve readability in your preamble, use indentation to indicate groupings. Data Capture ignores indentation in preambles.

Figure 14-25 **Preamble—groups**

```
(Name Employee name)(Format axxxxxxxxxx).
(Name Degrees)(Type Group).
     (Name Degree level)(Character 35)(Length 6).
     (Name Degree year) (Character 43).
     (Type Amount)(Format 9999).
     (End of Group).
(End of Preamble).
```

Explanation The (Type Group) clause indicates that the sentences immediately following in the preamble are for subcolumns. The (End of Group) clause separates the group sentences from any

additional top-level sentences. In this case, only the (End of Preamble) clause follows.

Each sentence within the Degrees group causes Data Capture to copy data into a matching subcolumn. The lines of data described in a group may repeat, as in this example. The Degrees column has multiple subrows for O'Brien and Liou.

The (Format axxxxxxxx) clause in the preamble picks up only the employee name. The letter "a" indicates only a letter or a blank is allowed. (Format xxxxxxxxx) or (Length 9) would have caused Data Capture to capture data from the count line as well.

Resulting table The table is shown in Table 14-13.

Table 14-13 **Resulting table—groups**

Employee name	Degrees	
	Degree level	Degree year
Smith, A.	B.A.	1980
Jones, E.		
O'Brien, W.	A.A.	1977
	B.S.	1980
Liou, D.	B.A	1955
	M.S.	1957
	Ph.D.	1962

(Format axxxxxx)

The letter "a" indicates that only a letter or a blank is allowed. If you use "a" in a Format clause, Data Capture will not capture numerical data, such as data from the count line.

Example 2: Subgroups

It is possible to have a group column in which one or more of its subcolumns are themselves groups.

Source data In the example in Figure 14-26, the information for each degree is followed by one or more course titles. Refer to Table 14-14 for the resulting table.

Preamble The preamble, also in Figure 14-26, instructs Data Capture to copy the two main levels of information: name and degree. The preamble treats Degrees data as one group with repeating subrows of degree level, year, and courses; and it treats Courses as a subgroup with repeating subrows of courses.

Explanation Another way to say this is: Courses is one of the Degrees subcolumns and is also a group itself. Degrees data can have multiple rows of course data for each degree.

The space in the (Format ' 'xxxxxxxxxxxxxxxxxx) clause distinguishes the courses information from the degrees information.

Figure 14-26 **Source data and preamble—subgroups**

```
(Name Employee name)(Character 1)
(Format axxxxxxxxxx).
(Name Degrees)(Type Group).
 (Name Degree level)(Character 36)(Length 6).
 (Name Degree year) (Character 43)(Type Amount)
 (Format 9999).
 (Name Courses)(Type Group).
    (Character 36)
    (Format ' 'xxxxxxxxxxxxxxxxx).
    (End of Group).
 (End of Group).
(End of Preamble).
12345678901234567890123456789012345678901234567
 Smith, A.   Marketing St. Louis   B.A.   1980
                                    Business
 Jones, E.   Admin.    Chicago
 O'Brien, W. Sales     Chicago     A.A.   1977
                                    English
                                   B.S.   1980
                                    Economics
                                    Philosophy
```

Resulting table In the resulting table, Table 14-14, the subcolumn Courses is a divided column having only one subcolumn. It has repeating subrows of course titles.

As with other examples in this chapter, various formatting changes were made to the table after running Data Capture. One of the changes was to make the extra line immediately under the Courses heading invisible. (The extra line allows for a subcolumn header under Courses; since there is only one subcolumn, the Courses title is sufficient.)

Table 14-14 **Resulting table—subgroups**

Employee name	Degrees		
	Degree level	Degree year	Courses
Smith, A.	B.A.	1980	Business
Jones, E.			
O'Brien, W.	A.A.	1977	English
	B.S.	1980	Economics
			Philosophy

Example 3: Multiple groups

Source data can contain several groups at the same level of the hierarchy.

Source data As shown in Table 14-15, each employee can also have a list of current projects. Projects is a group column at the same level as Degrees. Its sub-columns are Project name and Due date.

Preamble The preamble pattern is shown in Figure 14-27.

Figure 14-27 **Preamble general pattern—multiple groups**

```
Employee sentence.
Degrees group sentence.
   Degree level sentence.
   Degree year sentence.
   End of Group sentence.
Projects group sentence.
   Project name sentence.
   Due date sentence.
   End of Group sentence.
End of Preamble sentence.
```

Resulting table The table structure is shown in Table 14-15.

Table 14-15 **Table—multiple groups**

Employee name	Degrees		Projects	
	Degree level	Degree year	Project name	Due date
Smith, A.	B.A.	1980	Jupiter	4/ 1/88
			Venus	1/15/88
Jones, E.			Jupiter	4/ 1/88
O'Brien, W.	A.A.	1977	Apollo	1/15/88
	B.S.	1980	Venus	1/15/88
			Mars	7/30/88

Taking advantage of data indentations

This example illustrates how to capture data when your source document uses indentation to show groupings of data. Also refer to "Capturing key data using literals" for related examples.

To extract a list of employee names from the source data shown in Figure 14-28, you can take advantage of the indentations to avoid picking up fields that are not names.

Source data Only the first field of the group, the name field, is not indented. Preamble and source data are shown in Figure 14-28.

Preamble The "y" special format character is used to capture fields starting with a non-blank character.

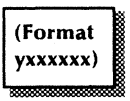
Resulting table Table 14-16 contains names only.

Figure 14-28 **Source data and preamble—indentations**

```
(Format yxxxxxxxxxxx).
(End of Preamble).
Smith, A.     Marketing St. Louis
 Competitive Anal    02 01 84
 Sirius Launch       12 11 83
Levin, E.     Admin.     Chicago
 Equipment Audit     01 01 84
 '84 Oper'g Plan     01 01 84
O'Brien, W.  Sales       Chicago
 Exxon Proposal      03 11 83
```

Table 14-16 **Resulting table—indentations**

Smith, A.
Levin, E.
O'Brien, W.



The "y" special format character is useful for detecting fields that are not indented. The (Format yxxxxxxxxxxx) clause instructs Data Capture to pick up only those fields that start with a non-blank.

Capturing fields after a group

Sometimes source data has a data group followed by an additional field of data, such as a subtotal. This section shows how to capture the group information and its subtotal.

After clause: Use the After clause to capture data fields that fall below a group.

Source data The example in Figure 14-29 has region titles, groups of employee data, and region totals. There are three lines of employee data in the Eastern region and two in the Central region.

Figure 14-29 **Source data—After group**

```
 Region: Eastern
EMPLOYEE        HIRED       YTD EARNINGS
Smith, A.       02-11-74     12,778.23
Jones, E.       07-12-82     12,622.11
O'Brien, W.     02-13-68     23,718.23
Total Eastern                49,118.57
12345678901234567890123456789012345678
 Region: Central
EMPLOYEE        HIRED       YTD EARNINGS
Liou, D.        12-11-78     26,737.00
Smith, D.       12-21-82          0.00
Total Central                26,737.00
```

Preamble The preamble in Figure 14-30 instructs Data Capture to list region name, region total, and region employee data.

Explanation In the preamble in Figure 14-30, the group property keeps the subcolumn data (name, date, and total) together and indicates to Data Capture that this information may repeat before Data Capture finds another region name. The After clause names the group, in this case Employee list, that the subtotal follows in the source data.

The order of the fields in the preamble is the order in which they appear in the resulting table.

Note: To specify a source data field that is below a group, you must use an After clause. This is because groups usually have a variable number of lines, so there is no way you can use a Line

Figure 14-30 **Preamble—After group**

```
(Format ' Region: 'xxxxxxxxxxxxxxx)
   (Name Region).
(Type Amount)(Format bbb,bb9.99)(Character 25)
   (Name YTD total)(After Employee list).
(Type Group)(Name Employee list).
   (Length 13)(Name Name).
   (Type date)(Format MM'-'DD'-'YY)
   (Character 15)(Name Date).
   (Type Amount)(Format bbb,bb9.99)
   (Character 25)(Name Total).
   (End of Group).
(End of Preamble).
```

clause to indicate the line in which the field can be found.

However, to specify a source data field that is to the right of a group, rather than below it, you cannot use the After clause. In this case, if it is necessary, use the Line clause.

Resulting table The table is shown in Table 14-17.

Table 14-17 **Resulting table—After group**

Region	YTD total	Employee list		
		Name	Date	Total
Eastern	49,118.57	Smith, A.	02/11/74	12,778.23
		Jones, E.	07/12/82	12,622.11
		O'Brien, W.	02/13/68	23,718.23
Central	26,737.00	Liou, D.	12/11/78	26,737.00
		Smith, D.	12/21/82	0.00

Defining table column order

The column order in the resulting table matches the order of the corresponding sentences in the preamble. You can use any sentence order, as long as the sentences for each group or subgroup are together.

The preceding example placed the group column last; however, you could reorder the preamble as shown in Figure 14-31. This would cause the YTD Total column to be the rightmost column in the resulting table.

Figure 14-31 **Preambles—column order**

Original preamble:	New preamble:
`Region sentence.`	`Region sentence.`
`YTD total sentence.`	`Employee list sentences.`
`Employee list sentences.`	`  End of Group sentence.`
`  End of Group sentence.`	`YTD total sentence.`
`End of Preamble sentence.`	`End of Preamble sentence.`

Capturing a group that occurs first

Capturing data when a group occurs first in the source data presents a special problem: There is no first line of top-level data, such as a region name, to indicate to Data Capture that a group is starting.

Capturing data when a group occurs first: Use an artificial sentence to indicate the beginning of a region or section. (An artificial sentence is one that does not cause any data to be copied into a table. Its Format clause contains only a literal.)

Source data Region subtotals follow the employee group data in Figure 14-32. There is no first line of region data to tell Data Capture to begin a new region.

Figure 14-32 **Source data—group occurs first**

```
EMPLOYEE        HIRED      YTD EARNINGS
Smith, A.       02-11-74    12,778.23
Jones, E.       07-12-82    12,622.11
O'Brien, W.     02-13-68    23,718.23
Total Eastern                49,118.57
12345678901234567890123456789012345678
EMPLOYEE        HIRED      YTD EARNINGS
Liou, D.        12-11-78    26,737.00
Smith, D.       12-21-82         0.00
Total Central                26,737.00
```

Preamble The preamble shown in Figure 14-33 begins with a sentence identifying the heading at the beginning of each region list. It then instructs Data Capture to list region total and employee data.

Explanation Data Capture scans the data looking for the specified literal. It does not create a column for the artificial sentence, since the sentence has only literals and there is no data to capture. Once Data Capture finds the literal, it is able to scan for the group data and the total data.

Resulting table Totals and employee data are in Table 14-18.

Figure 14-33 **Preamble—group occurs first**

```
(Format 'EMPLOYEE        HIRED      YTD EARNINGS').
(Type Amount)(Format bbb,bb9.99)(Character 25)
   (Name YTD total)(After Employee list).
(Type Group)(Name Employee list).
   (Length 13)(Name Name).
   (Type Date)(Format MM'-'DD'-'YY)
   (Character 15)(Name Date).
   (Type Amount)(Format bbb,bb9.99)
   (Character 25)(Name Total).
   (End of Group).
(End of Preamble).
```

Table 14-18 **Resulting table—group occurs first**

YTD total	Employee list		
	Name	Date	Total
49,118.57	Smith, A.	02/11/74	12,778.23
	Jones, E.	07/12/82	12,622.11
	O'Brien, W.	02/13/68	23,718.23
26,737.00	Liou, D.	12/11/78	26,737.00
	Smith, D.	12/21/82	0.00

Fixing errors in your preamble

There are two kinds of problems that can occur when you run Data Capture:

- **Syntax error:** The grammar, or structure, of the preamble is incorrect, and Data Capture

cannot continue. Data Capture displays an error message telling what the problem is and where it is located in the preamble. No table is created.

Remember or write down the displayed error message. The message disappears as soon as you use the mouse or keyboard.

- **Incorrect data:** The preamble syntax is correct, but the resulting table does not contain the desired data. One or more of your preamble clauses has incorrect information. As a result, Data Capture did not pick up the correct source data fields.

  Correct each sentence that did not produce the proper result. This often requires changing the Character clause value or making the Format clause more specific. (Making Format clauses more specific with special format characters is described throughout the "Writing preambles for Data Capture" chapter.)

  If Data Capture created a blank table, it means no matches were found for the required data fields. (Refer to the "Required clause" section.) One way to determine which sentences are incorrect is to add (Required No) to each sentence in the preamble and rerun Data Capture. The resulting table will have data for all correct sentences. The table entries that are blank match the incorrect preamble sentences.

Refer to Appendix O, "Data Capture messages," for a discussion of the common messages encountered when running Data Capture. Refer to the *QuickFind Reference* volume 11 for more information.

A. TTY character codes

This appendix describes the character codes that TTY-based terminal emulators can send.

Character codes and translation files

The TTY-based terminal emulators support the International Standards Organization (ISO) 646 7-bit coded character set interchange standard, of which ASCII is a subset. Character codes are translated to and from workstation characters by means of translation tables within the TTY translations data file. This file contains one translation table for each variation of the ISO 646 character set. The translation tables within this file are enumerated in the **Language** choices of the terminal emulator property and option sheets. The first table in the file is listed as the first choice, the second table is listed as the second choice, and so on.

The TTY translation data can be changed or replaced without having to change the system they are used with. This flexibility allows the workstation to handle multinational TTY emulation in a uniform manner. ISO 646 characters can be mapped into XC1 characters. All variations in the character sets are taken care of within the data files.

The translation file contains the appropriate mappings between the ISO 646 character standard and the Xerox character encoding standard. The character mappings for the US English characters are shown in Table A-1.

The keyboard is used to send various codes to the host computer. Some keys do not produce displayable characters but do send codes to the host. These keys include <Return> (0158), <Linefeed> (0128), <Backspace> (0108), <Esc> (0338), and <Delete> (1778). Other keys, such as <Ctrl> and <Shift>, do not transmit codes when typed; instead, they modify the codes transmitted by other keys. Table A-2 shows the control codes sent when <Ctrl> is held down.

Table A-1 **US English ASCII character codes**

Key	Lower-case octal code	Upper-case octal code	Key	Octal code	Key	Octal code
A	141	101	(Space)	040	:	072
B	142	102	!	041	;	073
C	143	103	"	042	<	074
D	144	104	#	043	=	075
E	145	105	$	044	>	076
F	146	106	%	045	?	077
G	147	107	&	046	@	100
H	150	110	'	047	[	133
I	151	111	(	050	\	134
J	152	112	)	051	]	135
K	153	113	*	052	^	136
L	154	114	+	053	_	137

Table A-1 **US English ASCII character codes (continued)**

Key	Lower-case octal code	Upper-case octal code	Key	Octal code	Key	Octal code
M	155	115	,	054	\	140
N	156	116	-	055	{	173
O	157	117	.	056	|	174
P	160	120	/	057	}	175
Q	161	121	0	060	~	176
R	162	122	1	061		
S	163	123	2	062		
T	164	124	3	063		
U	165	125	4	064		
V	166	126	5	065		
W	167	127	6	066		
X	170	130	7	067		
Y	171	131	8	070		
Z	172	132	9	071		

Table A-2 **Control codes sent using <Ctrl> and various workstation keys**

<CTRL> + key	Octal code trans-mitted	Mne-monic function	<CTRL> + key	Octal code trans-mitted	Mne-monic function
(Space)	000	NUL	P	020	DLE
A	001	SOH	Q	021	DC1
B	002	STX	R	022	DC2
C	003	ETX	S	023	DC3
D	004	EOT	T	024	DC4
E	005	ENQ	U	025	NAK
F	006	ACK	V	026	SYN
G	007	BEL	W	027	ETB
H	010	BS	X	030	CAN
I	011	HT	Y	031	EM
J	012	LF	Z	032	SUB
K	013	VT	[	033	ESC
L	014	FF	\	03	FS
M	015	CR	]	035	GS
N	016	SO	^	036	RS
O	017	SI	_	037	US

B. KSR35 invisible characters

All incoming ISO 646 characters in the range of octal 40_8 to 176_8 (inclusive) are displayable in the KSR35 window and appear in the KSR35 backing file (the contents of [Make Document] and [Make Screen] operations). All other ISO 646 characters except the following are ignored:

BEL (7_8)
Not stored into the backing file, but generates a tone when received

BS (10_8)
Performs a backspace on the display and the document

CR (15_8)
Positions the cursor to the beginning of the current line on the display

FF (14_8)
Performs a backspace on the display, and inserts a page break in the document

LF (12_8)
Goes to the current column in the next line on the display, and inserts a new line plus "x" number of spaces (where "x" = the number of spaces to current column)

TAB (11_8)
Inserts a tab in the backing file, with no visible effect in the KSR35 window

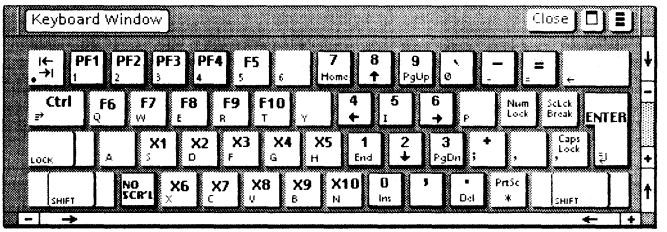
C. VT100 and VT640 escape sequences

This appendix describes escape sequences issued by each key on the VT100 and VT640 Alternate and PCR Auxiliary keyboards. PCR is an extended feature of VT100 and VT640 that enables workstations to exchange data with VT100-compatible PCs.

The PCR Auxiliary keyboard is the same as the VT100 and VT640 Alternate keyboards with the addition of PC keys and ten "X" keys.

Figure C-1 shows the PCR Auxiliary keyboard for the VT100 and VT640 terminal emulators. The keys illustrated with dark outlines appear on the DEC VT100 keyboard (and on the VT100 and VT640 Alternate keyboards). All the other keys, except the X keys, emulate PC keys. The X keys provide additional escape sequences for applications or equipment requiring more keys than those present on the VT100 and PC keyboards.

Figure C-1 **Auxiliary PCR keyboard**



Key modifiers

The <Ctrl>, <Left Shift>, and <Right Shift> keys on the PCR Auxiliary keyboard and the <Alt> function key are used as key modifiers. They behave differently from other keys: While a modifier key is pressed, the escape sequence issued for any nonmodifier key is always preceded by the escape sequence of the modifier.

For example, when <Left Shift> is pressed and the <F5> and <F6> keys are typed in, the escape sequence for the <Left Shift> is sent prior to the escape sequences of <F5> and <F6>. If <Alt> and <X1> are entered before <Alt> is released, the escape sequence sent is Esc, \, A, Esc, \, A for <Alt> and Esc, \, H for <X1>.

PC keys

The keys described in Table C-1 are not present on the DEC VT100 keyboard but appear on the IBM PC keyboard. Table C-1 shows the escape sequences issued by these keys.

Table C-1 **PC keys**

Key	Escape sequence
Num Lock	Esc, \, N
ScLck / Break	Esc, \, S
Alt	Esc, \, A
PrtSc / *	Esc, \, P
F5	Esc, \, 5
F6	Esc, \, 6
F7	Esc, \, 7
F8	Esc, \, 8
F9	Esc, \, 9
F10	Esc, \, 0

Redefined VT100 keys

The keys described in Table C-2 appear as duplicates of keys found on the DEC VT100 terminal keyboard. However, when the VT100 or VT640 PCR feature is enabled, these keys send special escape sequences. Table C-2 shows the escape sequences issued by these keys.

Table C-2 **Redefined VT100 keys**

Key	Escape Sequence
Shift (Left)	Esc, \, L
Shift (Right)	Esc, \, R
Ctrl	Esc, \, C
Caps Lock	Esc, \, K
⇆	Esc, \, T
+	Esc, \, +

VT100 keys

The VT100 keys that duplicate those on the DEC VT100 terminal keyboard also appear on a PC keyboard. The escape sequences associated with these keys are the same as for the VT100. For more information about these keys, see the DEC *VT100 Programming Reference* card.

The PF keys for the VT640 terminal emulator are described in the chapter on that emulator.

Additional escape sequences: X keys

The keys described in Table C-3 do not appear on the IBM PC keyboard or the DEC VT100 keyboard. Special escape sequences are provided for these keys.

Table C-3 **X keys**

Key	Escape Sequence
X1	Esc, \, H
X2	Esc, \, G
X3	Esc, \, U
X4	Esc, \, D
X5	Esc, \, 1
X6	Esc, \, E
X7	Esc, \, F
X8	Esc, \, Y
X9	Esc, \, Z
X10	Esc, \, 2

D. Tektronix and VT640 control characters

The Tektronix 4014 and VT640 Graphics window control characters and their effect upon the terminal are shown below:

BEL

Rings the bell and clears the bypass condition.

BS

Backspaces the character cursor location.

CAN

As the second character in the ESC CAN sequence, it selects the bypass condition to inhibit terminal response to echoed data.

CR

Carriage return; resets the terminal from graph mode to Alpha Mode; cancels Crosshair, setting Alpha Mode but leaving the terminal in an undefined margin (page full) status; clears the bypass condition.

Note: As the second character is an ESC sequence, CR will not be responded to. This can be used to advantage when it is required that the terminal not respond to CRs. Any further CRs will be ignored. To get out of the CR ESC condition, send BEL, or some other non-operative control character that will change the mode selected.

ENQ

As second character in ESC ENQ sequence, it causes a bypass condition and creates one of the following GIN (or Crosshair) Mode situations:

- Causes the terminal status and address of the lower left corner of the alpha cursor to be sent to the computer if received while the terminal is in alpha mode.

- Causes terminal status and address of the display beam to be sent to the computer if it is received while the terminal is in graph mode. Polling the terminal with an ESC ENQ immediately following a hardcopy request results in a terminal response after copying is completed.

ESC

Makes the terminal sensitive to certain control characters received immediately after ESC (see ENQ, ETB, FF, and SUB.) Other characters may be used in sequence with the ESC for terminal control.

ETB

As the second character in the ESC ETB sequence, creates a make copy signal, which behaves just like a [Make Screen] window menu command. ESC ETB clears the bypass condition.

FF

As the second character in the ESC FF sequence, it erases the screen, selects alpha mode, sets the cursor to home position, sets margin 1, and clears the bypass condition.

FS

Sets the terminal to point plot mode; the terminal plots the end of the vector. The data is identical to standard vector plotting.

GS

Sets the terminal to graph mode, in which vectors are displayed; initially sets the terminal to write dark vectors (unwritten). For performance reasons the first (dark) vector is implemented as a beam move, and hence cannot be used to erase an existing vector. Subsequent vectors are displayed normally.

HT

Spaces the cursor one space to the right. Spacing past the end of the line causes an automatic line feed/carriage return.

LF

Cursor moves down one line; if the cursor moves past the bottom of the display it "wraps" the display, selecting the alternate margin. Also clears the bypass condition. LF has same effect as CR when preceded by ESC.

RS

Sets the terminal to incremental plot mode; addressing is relative. The character following RS determines if the writing beam is turned on or off. The next character determines the direction in which the writing beam moves (up, down, left, right or any diagonal).

SUB

As the second character in ESC SUB sequence, it sets the GIN mode and starts the crosshair cursor. It clears graph mode and activates the bypass condition.

US

Resets terminal to Alpha Mode.

VT

Causes reverse linefeed; moves the cursor one line up.

E. VT640 escape sequences

The VT640 terminal emulator provides the following escape sequences:

Character Sizes

ESC 0 Set character size to 1 x (normal)

ESC 1 Set character size to 2 x

ESC 2 Set character size to 3 x

ESC 3 Set character size to 4 x

Line Types

ESC ` Set normal line type

ESC a Set dotted line type

ESC b Set dot-dash line type

ESC c Set short dash line type

ESC d Set long dash line type

Transition Codes

ESC "0g Enter Transparent Mode

ESC "4g Enter Crosshair (GIN) Mode

Data Level

ESC/0d Set data level, dots on

ESC/1d Set data level, dots off

ESC/2d Set data level, dots complemented

Miscellaneous

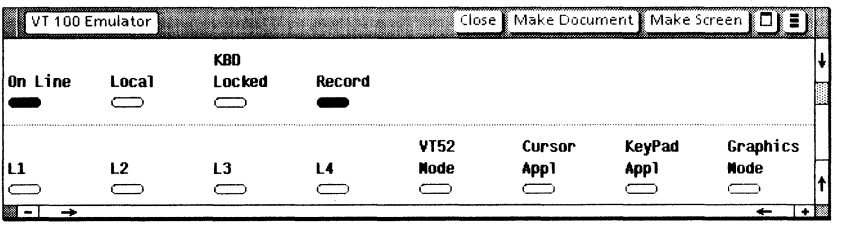
ESC/f	Load vector location into crosshair location

F. TTY status indicators

This appendix describes TTY "light" indicators. A subset of these indicators displays for most TTY-type terminal emulators. A filled-in oval indicates that the light is on.

Light indicators are status indicators, displaying feedback from the host computer about the status of the terminal. Figure F-1 shows an example of these light indicators as they appear in the top part of the VT100 window status area. (The second row of lights only displays for the VT100 terminal emulator.)

Figure F-1 **VT100 window status area**



Online

Indicates whether the emulator is ready to transmit data. When off, it indicates the emulator is not sending data to the host. The Online status does not affect the connection with the host, and data from the host is still received and processed by the terminal emulator. This condition is set and cleared by selecting [Enable/Disable On-Line] in the Floating Items auxiliary menu.

Local Echo

Indicates whether the emulator is echoing the

characters you type. It is set and cleared by selecting [Enable/Disable Local Echo] in the Floating Items auxiliary menu.

KBD Locked

Indicates that the keyboard has been turned off. The emulator is still able to receive data from the host computer.

Record

Indicates whether screen data is being saved to a backing document as it gets scrolled off the screen. You can set this on or off by selecting the [Record/Don't Record Data] command on the floating items auxiliary menu. Performance is increased slightly when Record is off, because the data is not being copied to the backing file.

G. VP and EBCDIC translation tables

The following tables show how ViewPoint document format characters translate to EBCDIC format character codes during file transfer and how EBCDIC format character codes translate to ViewPoint format characters.

Table G-1 **ViewPoint to EBCDIC**

ViewPoint format characters	Translation	HEX code value
New paragraph	Carriage return, line feed	0D,25
New line	Carriage return, line feed	0D,25
Paragraph tab	Tab	05
Tab	Tab	05
Page break	Form feed	0C
Page format	No translation	No translation

Note: When sending a ViewPoint document to the host, new paragraph and new line characters will translate into a carriage return and line feed character.

Table G-2 **EBCDIC to ViewPoint**

EBCDIC format characters	EBCDIC (hex)	ViewPoint translation
Null	0	Space
Horizontal tab	5	Tab
Vertical tab	0B	New line
Form feed	0C	Page break
Carriage return	0D	New line
Line feed	25	New line
New line	15	New line
Carriage return & line feed	0D,25	New paragraph
Carriage return & new line	0D,15	New paragraph
Line feed & carriage return	25,0D	New paragraph
New line & carriage return	15,0D	New paragraph

H. Host status messages

The following status messages may be displayed during the course of a file transfer operation. These status messages are generated by the IBM IND$FILE MODULE file transfer program.

Host status messages

TRANS03 File transfer is complete

Explanation:
The file transfer operation completed successfully without any errors.

Response:
Check the information stored in the file on the host or the workstation to confirm that the operation completed successfully.

TRANS04 File transfer complete, with records segmented

Explanation:
The file was transferred to the host successfully; but, the logical record length specified was exceeded. This resulted in the contents of the file being placed in multiple records. This status message will usually occur when the [Append Carriage and Line Feed] option is used.

Response:
There are two ways to avoid the situation. First, transfer the file to the host with a **File Transfer Mode** of [Transparent]. This will prevent any interpretation of the file. Second, examine the text file and determine

the length of the longest line or the number of characters in the longest paragraph. Transfer the file again with the logical record length set to the length of the longest line or paragraph.

TRANS06 Command incomplete: file transfer canceled

Explanation:
An invalid parameter was detected by the host when the Send or Receive file transfer option was invoked.

Response:
Check the parameters entered and retry the transfer operation. If the problem continues, contact the System Administrator.

TRANS08 Command transmit error: file transfer canceled

Explanation:
An invalid code was sent to the host that resulted in a transmission error.

Response:
Verify that there is a connection to the host and that the IND$FILE MODULE application is available on the host. Retry the file transfer operation. If the problem continues, contact the System Administrator.

TRANS13 Error writing file to host: file transfer canceled

Explanation:
An error was detected while transferring a file to the host.

Response:
Retry the Send operation.

TRANS14 Error reading file from host: file transfer canceled

Explanation:
An error was detected by the host while transferring the file to the workstation.

Response:
Retry the Receive procedure.

TRANS15 Host storage unavailable: file transfer canceled

Explanation:
Insufficient storage available for the file transfer Send operation. In addition to your host main storage requirements, 30k of additional memory is needed. Contact the host System Administrator. The storage requirement should not be confused with disk space.

Response:
Contact the host System Administrator for additional storage, and try to send the file again.

TRANS16 Incorrect request code: file transfer canceled

Explanation:
A parameter specified in the Send or Receive option sheet was incorrect.

Response:
Verify the parameters entered and retry the file transfer operation. If the problem persists, contact the System Administrator.

TRANS17 [CICS version] Invalid file name: file transfer canceled

Explanation:
The file name specified in the Send option sheet or the name of the icon being transferred to the host is not a valid name for

a CICS file. CICS file names are 1 to 8 characters in length.

Response:
Enter a valid CICS file name and retry the operation. See the *CICS User's Guide* for the naming conventions for files.

TRANS17 [CMS version] Missing or incorrect CMS file name: file transfer is canceled

Explanation:
The file name specified in the Send option sheet or the name of the icon being transferred to the host is not a valid name for a CMS file. A CMS file name is 1 to 8 characters in length.

Response:
Enter a valid CMS file name and retry the operation. See the *CMS User's Guide* for the naming conventions for files.

TRANS17 [MVS/TSO Version] Missing or incorrect TSO data set name: file transfer canceled

Explanation:
The MVS/TSO file specified in the Send option sheet is missing, or not a sequential or partitioned data set.

Response:
Enter a valid MVS/TSO data set name and retry the transfer operation.

TRANS18 Incorrect option specified: file transfer canceled

Explanation:
An option specified in the Send or Receive option sheet was rejected by the host.

Response:
Verify that the parameters entered are valid. If the problems persists, determine which

option is causing the problem and report this information to the System Administrator.

TRANS19 Error handling host file: file transfer canceled

Explanation:
There may not be enough space for the file transfer operation.

Response:
Verify that there is enough disk storage available for the file to be transferred. Retry the file transfer operation. If the problem persists contact your host support center.

TRANS25 Keyboard inhibited: file transfer canceled

Explanation:
The keyboard was locked when the host received the file transfer request.

Response:
Wait for the host to unlock the keyboard before issuing the file transfer Send or Receive operation.

TRANS27 Communication sequence with host disrupted: file transfer canceled

Explanation:
During the course of the file transfer operation, an error was detected by the host, or the <STOP> key was pressed.

Response:
Retry the file transfer operation. If the problem continues provide the following information to the host System Administrator:

- The sequence of events (include all keystrokes)
- The message number
- The system's level

TRANS28 Invalid option XXXXXXXXX: file transfer canceled

Explanation:
The option specified in the option sheet will appear in place of XXXXXXXXX. The option may be invalid for one of the following reasons:

- The option is not recognized.
- The option is a keyword.
- The value associated with option is incorrect.

Response:
Make the necessary corrections to the option and retry the transfer operation.

TRANS29 Invalid option XXXXXXX with RECEIVE: file transfer canceled

Explanation:
The parameter specified in the Receive option sheet will appear in place of XXXXXXX. The parameter or option specified is not valid for Receive.

Response:
Make the necessary corrections to the option and retry the transfer operation.

TRANS30 Invalid option XXXXXX with APPEND: file transfer canceled

Explanation:
The parameter specified in the Send option sheet will appear in place of XXXXXX. The parameter or option specified is not valid for an Append operation.

Response:
Make the necessary corrections to the option and retry the transfer operation.

TRANS31 Invalid option XXXXX without SPACE: file transfer canceled

Explanation:
The parameter specified in the Send option sheet will appear in place of XXXXX. The parameter specified can only be used when the [Set Space Allocation] option is specified.

Response:
Remove the option and try again.

TRANS32 Invalid option XXX with PDS: file transfer canceled

Explanation:
The option specified in the option sheet will appear in place of XXX. The option specified is not valid for a host partitioned data set.

Response:
Disable option and try again.

TRANS33 Only one TRACKS, CYLINDERS, AVBLOCK allowed: file transfer canceled

Explanation:
Use units of [Tracks], [Cylinders], or [Avblock] to specify the [Set Space Allocation] choice. Only one can be used.

Response:
Disable option and retry transfer operation.

TRANS34 CMS file not found: file transfer canceled

Explanation:
The file specified in the option sheet does not exist.

Response:
Enter the name of an existing file in the Send option sheet.

TRANS35 CMS disk is Read-Only: file transfer canceled

Explanation:
The file selected for transfer corresponds to an existing file on CMS that does not have write access.

Response:
Change the CMS file to allow both read and write access.

TRANS36 CMS disk is not accessed: file transfer canceled

Explanation:
The file mode specified in the CMS options is not in the CMS disk search order.

Response:
Correct the CMS file mode specification in the option sheet. If the problem continues, contact the host System Administrator.

TRANS37 CMS disk is full: file transfer canceled

Explanation:
This problem may result when a CMS disk file has reached its maximum number of files allowed on the disk (3400) or that the maximum number of data blocks allowed (16,060) for a file has been reached.

Response:
Transfer the file to a disk that will provide enough space, or delete all unwanted files from the CMS disk. If the file being transferred exceeds 1 megabyte (2000 disk pages) of data, it is recommended that the file be broken up into pieces before transfer.

TRANS99 Host program error code XX XXXXXXXX: file transfer canceled

Explanation:
This message will result when an error has been raised in the host file transfer program.

Response:
Contact the host System Administrator and provide the following information:

- The sequence of events (include the order in which keys were pressed)
- The message number
- The system level

I. Xerox Character Set 0 values

The Xerox Character Set 0 serves as ViewPoint's default 8-bit character set. This character set is compatible with the 8-bit ASCII/ISO/CCITT character set specification. The following table outlines the character set graphic symbols and numeric code values.

Table I-1 **Xerox Character Set 0 (part 1)**

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

Table I-1 **Xerox Character Set 0 (part 2)**

Hex code	ASCII/ISO/CCITT Roman alphabet and punctuation					
	A	B	C	D	E	F
0		°		—	Ohms	GrnLand
1	¡	±	`	1	Æ	æ
2	¢	2	´	®	Croat	Croat.
3	£	3	ˆ	©	Iceland	Iceland
4	$	×	˜	™	Maltese	Maltese
5	¥	Micro	¯	Note		ı
6		¶	˘		IJ	ij
7	§	·	˙		CataLan	CataLan
8		÷	¨		Polish	Polish
9	'	'			Ø	ø
A	"	"	°		Œ	œ
B	≪	≫	¸		Span.	ß
C	←	¼	_	1/8.	IceLand	IceLand
D	↑	½	˝	3/8.	Lapp	Lapp
E	East arrow	¾	˛	5/8	Lapp	Lapp
F	South arrow	¿	ˇ	7/8	ŉ	

Characters whose graphic symbols are not displayed in Table 1 are defined as follows:

AE_{16} East arrow = rightward arrow

AF_{16} South arrow = downward arrow

$D5_{16}$ Music Note

$E0_{16}$ Ohm sign — Not uppercase Greek "omega"

$E2_{16}$ Uppercase D with stroke (Croatian)

$E3_{16}$	Feminine Spanish ordinal indicator as independent character
$E4_{16}$	Uppercase H with stroke (Maltese)
$E7_{16}$	Uppercase L with middle dot (Catalan)
$E8_{16}$	Uppercase L with stroke (Polish)
EB_{16}	Masculine Spanish ordinal indicator as independent character
EC_{16}	Uppercase "Thorn" (Icelandic)
ED_{16}	Uppercase T with stroke (Lapp)
EE_{16}	Uppercase "Eng" (Lapp)
EF_{16}	Lowercase n with apostrophe (South African)
$F0_{16}$	Lowercase k (Greenlandic)
$F2_{16}$	Lowercase d with stroke (Croatian)
$F3_{16}$	Lowercase "Eth" (Icelandic)
$F4_{16}$	Lowercase h with stroke (Maltese)
$F7_{16}$	Lowercase l with middle dot (Catalan)
$F8_{16}$	Lowercase l with stroke (Polish)
FC_{16}	Lowercase "Thorn" (Icelandic)
FD_{16}	Lowercase t with stroke (Lapp)
FE_{16}	Lowercase "Eng" (Lapp)

J. Host file naming conventions

The naming conventions for each of the three host environments (TSO, CMS, CICS) are different. The following information is a detailed explanation of each host's string file name syntax.

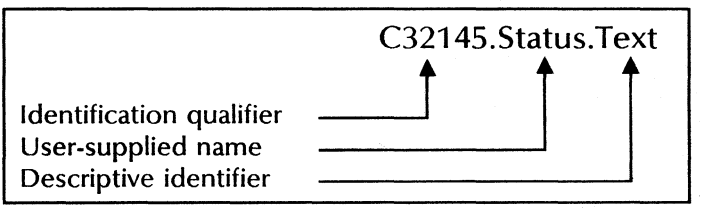
TSO data set naming conventions

The name of a TSO data set (file), in most cases, consists of three parts:

- Identification qualifier
- User-supplied name
- Descriptive identifier

A data set name can be made up of several fields with the condition that each field is separated by a period (.). The field length must not exceed 8 alphanumeric characters, and the first character in the field must be an alphabetic character. The total length of a file name must not exceed 44 characters, including the periods.

The following is an example of a TSO file name:



In the previous example, the identification qualifier (IDQ) is the logon id used during the logon procedure or the qualifier name assigned using the TSO PROFILE command. When retrieving or sending files to your own account, the IDQ is not required but should be used when accessing files under a different TSO account.

Accessing other TSO accounts will be discussed in the following section, "Cross account file access."

The user-supplied name should be one that uniquely identifies the file. The name can be specified as a series of fields separated by a period, or as one single field.

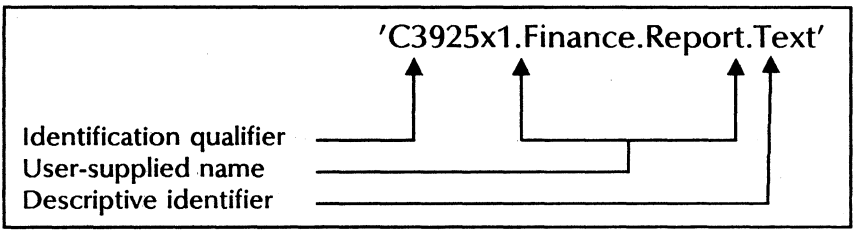
The descriptive identifier is used to identify the contents of a file. The following descriptive qualifiers are typically used in TSO:

Descriptive qualifier	**Data set contents**
ASM	Assembly language program input file
CLIST	TSO commands and sub-commands
CNTL	JCL and SYSIN for SUBMIT command
COBOL	American National Standard COBOL program statements
DATA	Uppercase text
FORT	FORTRAN statements
TEXT	Uppercase and lowercase text
VSBASIC	VSBASIC program statements

Consult the *IBM OS/VS2 Terminal User's Guide* for additional information about descriptive qualifiers for TSO.

Cross account file access

To retrieve or send files to other TSO accounts, the IDQ must be used as a part of the file name. The entire file name must be enclosed in apostrophes, including the IDQ. The following examples illustrate how to access a file on another account:



If this file name format is used to send or receive a file under your own TSO account, the file transfer application responds with the following error message:

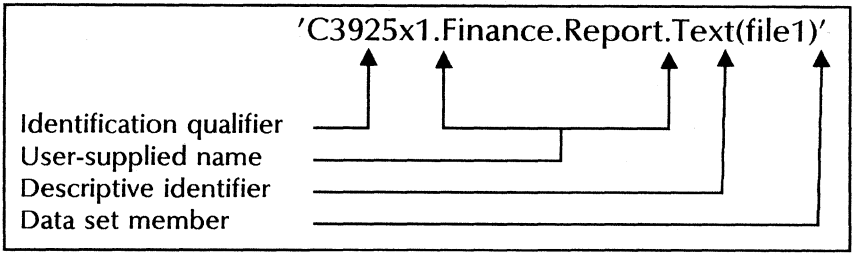
"TRANS18 Incorrect option specified: file transfer canceled."

Accessing partitioned data sets

A partitioned data set is made up of one or more data sets which are referred to as members. This is similar to folders in the ViewPoint environment, where a folder is a file whose contents consists of files.

A member of a partitioned data set is accessed by inserting the name of the member (enclosed in parentheses) immediately following the fully-qualified name. The name of the member must be within the apostrophes. Only the file name is subject to the 44-character limit. The

following example demonstrates how to access a member that is located in a data set on another IDQ.



To access a member on your own account, it is not necessary to specify the IDQ. The following examples illustrate the naming convention for accessing files on your own TSO account:

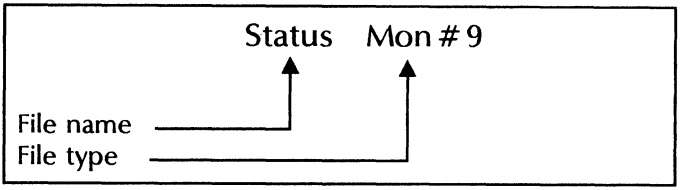
Finance.Report(File1)
Finance.Report.Text(File1)

Passwords for data set

If password protection is specified for a data set, it is a requirement to append the password to the end of the file name to access the file. The password is separated from the file name with a slash (/) and is inside the quotes. Only the file name is subject to the 44-character limit.

CMS data set naming conventions

In CMS, file names and file types are 1 to 8 characters in length. Valid characters consist of alphabetic characters (A through Z, a through z), numeric characters (0 through 9), and the following symbols: $, #, and @.



CMS allows for duplicate file names, but the file type assigned to each file must be different. Duplicate file types are also allowed for files, as long as the file names are unique. Below are some examples of files with duplicate names and file types.

File Name	File Type
Financial	Report
Financial	Data1987
Financial	Folder
Financial	Intpress
Basket	VPICON
Document	VPICON
Printer	VPICON
Book	VPICON

CICS data set naming conventions

File names in CICS are 1 to 8 characters in length. The first character in a file name must be alphabetic. The characters that follow may either be alphabetic characters or numeric characters.

K. User scenarios

VP IBM 3270 File Transfer is a tool that permits the 6085 or 8010 user to participate in the exchange of information, for example, text and data files. As with any tool, its applications can be expanded to perform tasks other than those defined. Following are some of the many uses of the *VP IBM 3270 File Transfer* application. It should be noted that use of *VP IBM 3270 File Transfer* is not limited to the following examples.

Archiving of ViewPoint documents

Using the [VP Icon] transfer mode, ViewPoint documents (such as memos and technical publications) can be stored, while maintaining the integrity of the contents, on the immense storage facilities of the IBM host. By placing documents on the IBM 3270 host, other Xerox 6085 or 8010 users are able to retrieve these documents, make changes, and store the edited versions back on the host.

Document content architecture environments

When operating in an IBM 3270 environment where Document Content Architecture (DCA) is the document standard, *VP File Conversion of IBM DCA Documents*, used in conjunction with *VP IBM 3270 File Transfer*, permits 6085 or 8010 users to transfer DCA documents to IBM personal computers that are networked to the IBM 3270 host. The following procedure allows a user to

transfer the contents of a ViewPoint document to a recipient using IBM DisplayWrite III software:

1. Using the converter icon and the *VP File Conversion of IBM DCA Documents* software, convert the ViewPoint document into a DCA revisable-form text document.

2. When the conversion is completed, name the file using the required host naming conventions.

3. Establish a 3270 session.

4. Select the DCA document and then select [Send] in the auxiliary menu in the 3270 window to bring up the Send option sheet.

5. To maintain the contents of a DCA document being transferred to the host, a transfer mode of [Transparent] must be used, along with a variable or undefined record format. TSO provides both a variable and undefined record format, while CMS provides only variable.

6. Select [Start] in the option sheet.

7. Using a binary or transparent file transfer operation, IBM PC users can download the file to the PC.

Note: The above procedure is not limited to DCA documents. This procedure can be used for other document environments, such as WordStar, 860, and Wang.

Publishing applications

One of many attractive features exhibited by the 6085 and 8010 workstations is the ability to produce high-quality documents. Using the *VP IBM 3270 File Transfer* tool, EBCDIC text files that were produced through a Report Program Generator (RPG) or through the host word

processing facilities can be downloaded to the Xerox 6085 or 8010 workstations via [VP Text] transfer. The [VP Text] transfer option will place the inbound text directly into a ViewPoint document. When the transfer has been completed, the desktop publishing features of the ViewPoint editor can be used to produce a high-quality document that can be filed, printed, and distributed throughout the Xerox Network System environment.

L. Data Capture clause properties and values

Table L-1 on the following page lists:

- The properties that may be used in Data Capture clauses
- A description of the values that may be used for each property
- The default value assumed for each property when the clause is omitted

Refer to the "Data Capture preamble clauses" chapter for more information.

Table L-1 **Clause properties and values**

Property	Value	Default
After	Group column name	None
Case	Choices: S, U, L, UL, UL UL, UL LL, UL SL	S
Character	Positive integer	1
Comment	Arbitrary text, no left or right parentheses	No comment
Format (for Type = Text, Amount, or Date)	Text can be any combination of: a x y 9	All x's
	Amount characters can be: 9 b * + - ( ) , .	All b's, with leading minus sign. Number of characters is from Length.
	Date examples: DD'.'MM'.'YY YYYY'-'MM'-'DD YY' 'MMDD' date'	MM'/'DD'/'YY
Language	Examples: USEnglish, US English, UK English, UKEnglish	The language of the workstation
Length	A positive integer with no commas or periods	Taken from the Format value length
Line	A positive integer with no commas or periods	1
Name	Text string, no right parentheses	A system-generated name in table property sheet. Heading is empty.
Required	Yes or No	Yes
Type	Text, Amount, Date, Group	Text

M. Data Capture special format characters

Table M-1 on the following page lists the special format characters allowed in Format clauses when Type = Text or Type = Amount. Refer to the "Format clause" section in the "Data Capture preamble clauses" chapter for more information.

Table M-1 **Special format characters**

Special format character	Corresponding field position contents
Type = Text:	
a	Letter or blank
9	Digit or blank
x	Any character
y	Any character except a blank
Type = Amount:	
9	Digit
b	Digit, blank, comma, decimal point, left or right parenthesis, minus sign, standard keyboard hyphen. Can also match currency symbols.
*	Digit or asterisk
+	Plus sign, minus sign, standard keyboard hyphen, blank
-	Minus sign, standard keyboard hyphen, blank, plus sign, asterisk
( )	Parentheses surrounding the characters, blank. Left parenthesis can match asterisk.
	Comma, plus sign, minus sign, standard keyboard hyphen, blank, left or right parenthesis. Can be treated as b or *.
	Decimal point, minus sign, standard keyboard hyphen, blank, right parenthesis

N. Data Capture source data modification

There may be times when you wish to modify your source data format to make it acceptable to Data Capture.

Emulation data

Documents created from emulation sessions are usually formatted correctly for Data Capture. For example, you do not need to change text properties or eliminate line wraparound. However, you may encounter the special cases described in this section.

Lines separated by punctuation

If your source data has lines of data (that correspond to table rows) separated by punctuation, you must replace the punctuation with new-line characters. Either manually replace the punctuation with new-line characters, or use <FIND> to do the replace operation for you.

Figure N-1 has two examples:

- Case 1 shows replacement of just the semicolons that separate lines, or rows, of data.
- Case 2 shows the results of using the <FIND> command to locate every semicolon and replace it with a new-line character.

Data Capture can extract data for either Case 1 or Case 2. Case 2 requires that Line clauses be used in the preamble. (Refer to the "Line clause" and "Working with multiple data lines" sections.)

Figure N-1 **Source data—punctuation**

Original source data:

```
Abbot, A;Accountant;24411;Johnson, C;Management
Trainee;66110;Song, S;Consultant;01234;
```

Case 1, after manually replacing end-of-line semicolons with new-line characters:

```
Abbot, A;Accountant;24411
Johnson, C;Management Trainee;66110
Song, S;Consultant;01234;
```

Case 2, after using <FIND> to replace all semicolons with new-line characters:

```
Abbot, A
Accountant
24411
Johnson, C
Management Trainee
66110
Song, S
Consultant
01234
```

Multiple-line fields

Data Capture does not recognize a source data field that is divided in two by a new-line character. (If the field just appears to be separated into two different lines because of line wraparound, Data Capture will recognize it.)

If your source data has a field divided by a new-line character, you can select and delete the new-line character before running Data Capture. Some data formatted with new-line characters may require too much modification to be suitable for Data Capture, however.

Noise lines

Computer-generated reports sometimes have lines of noise characters. Repeated column headings or page numbers are examples of noise. Usually your preamble causes Data Capture to ignore such characters.

One case that causes problems occurs when the data wraps around, and noise, such as page numbering, is inserted between two of the lines. You should delete the noise before running Data Capture.

Data fields with inconsistent patterns

If you encounter source data that does not quite follow a single pattern, you may be able to modify this data so Data Capture can process it.

Other sources of data

If your data was not generated by terminal emulation, it may contain tabs or paragraph margins. You may wish to delete these so you can determine character positions more easily when you write your preamble. There may appear to be more spaces in the data than there really are.

- Use the <FIND> key to locate the tabs and replace them with spaces.
- Use the paragraph property sheet to set paragraph margins to zero.

O. Data Capture messages

This appendix lists and explains common information and error messages encountered when running Data Capture. Refer to the *QuickFind Reference* volume 11 for more information.

When one of the messages below is displayed in the message area, "xxxx" is replaced by the preamble text that is near the error.

- **Preamble in document ignored...Using stored preamble**

  The preamble found in the document is ignored because the [Set Preamble] command is in effect. If you did not intend this, press <STOP> to cancel Data Capture, select [Discard Preamble] in the desktop auxiliary menu, and restart Data Capture.

- ****** PREAMBLE ERROR **** at least one column must be required at xxxx**

  At least one column must be (Required Yes). Make sure that all of the columns are not designated (Required No). (Required Yes) is the default.

- ****** PREAMBLE ERROR **** Bad Group Property at xxxx**

  The properties: Format, Length, Character, Language, and Case have no meaning for group columns. Each subcolumn may have its own values for these properties. Delete the inapplicable group property.

- ****** PREAMBLE ERROR **** Bad Preamble Format at xxxx**

This message appears when the Format clause is not valid. xxxx is a list of the format characters. Refer to the "Format clause" section for more information.

One common error involves blanks. There must be only one blank separating the word Format from the format characters. There should not be any other blank spaces in the clause.

Another common error involves using a special format character that is invalid for the specified Type. For example, if the Type = Amount, the clause (Format aaa) is illegal since "a" can only be used when the Type = Text.

- ****** PREAMBLE ERROR **** Circularity in 'afters' at xxxx**

  The preamble's After clauses indicate an impossibility: that fields follow after each other. For example, if field A follows B, and B follows C, then field C cannot follow field A.

- ****** PREAMBLE ERROR **** Duplicate column ATTRIBUTE found at xxxx**

  This message appears when a sentence contains more than one clause for the same property.

- ****** PREAMBLE ERROR **** Missing (Character at xxxx**

  An opening parenthesis is missing from a clause.

- ****** PREAMBLE ERROR **** No Termination Character at xxxx**

  This message usually appears when a closing parenthesis is missing from a clause.

- ****** PREAMBLE ERROR **** Unexpected End Of File at xxxx**

  xxxx represents the last few characters in the document. The most common reasons for this error are:

  The "(End of Preamble)." sentence is missing from the preamble.

  A preamble literal does not have an end quote, either because the quote is missing or because it is not a right single quote or apostrophe. Data Capture considers the rest of the document to be part of the literal. If you are not using the ASCII keyboard, use the right single quote, not the <SHIFT> left quote.

- ****** PREAMBLE ERROR **** Unknown SIBLING column at xxxx**

  This error message appears if an After clause contains a column name that does not exist or that is misspelled.

- ****** PREAMBLE ERROR **** Value expected at xxxx**

  The value part of a clause is missing.

- ****** PREAMBLE ERROR **** Wrong or incorrectly formed keyword at xxxx**

  This message usually appears when a Data Capture keyword, such as Length, is misspelled.

- **Table has too many fields for Document...Aborting Copy of Text to Table**

  The maximum number of fields that Data Capture can copy into a table is determined by the Document Editor. Divide the source data into two or more documents and rerun Data Capture.

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5. How can we improve the documentation?

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Page No.	Error
_____	_____
_____	_____
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